

**An introduction to the European Aerospace Industry. Case
company: Forza Global Solutions**

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Bachelor's Thesis

Degree Programme in International

Business

2014



International Business

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<p>Title of report An introduction to the European Aerospace Industry. Case company: Forza Global Solutions</p>	<p>Number of report pages and attachment pages 37</p>
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<p>Forza Global Solutions is a small, growing business that operates in a niche market and constantly looks for new opportunities. This has led to a commission for a market analysis on European aerospace industry to find out if the commissioner should consider entering the given market and the topics that require a more detailed attention.</p> <p>The objective was to find characteristics and situation of the aerospace manufacturing industry in Europe. The commissioner is based in Mexico and has its customers mostly within automotive sector in North America, whereas Europe is a rather new market for it.</p> <p>This report consists of market analysis and competitive strategy theories by authors such as Michael Porter and David Aaker as well as online sources such as NetMBA. Data from aerospace, plastic packaging and returnable transit packaging in Europe is gathered based on the guidelines from the theory. The data are analyzed and summarized in the end. Also, a SWOT analysis is made in the end of the report, based on the data and the commissioner's internal factors.</p> <p>According to the key findings, the industry is rather challenging to enter since the buyers' requirements for suppliers are strict and the competition is fierce. However, there is a vast market which is why further areas of investigation are discussed.</p>	
<p>Keywords Market analysis, aerospace, industry analysis, market entry, strategy</p>	

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Abbreviations

EU	European Union
MES	Minimum Efficient Scale
MRO	Maintenance, Repair and Operations
OEM	Original Equipment Manufacturer
RTP	Returnable Transit Packaging
SME	Small and Medium Enterprises

1 Introduction

The idea of writing a bachelor's thesis for Forza Global Solutions developed while doing a work placement for the company. The company's needs and interesting topics were discussed several times during the work placement and later via online meetings. The European aerospace industry was chosen since according to the commissioner (Aquino 12 February 2014), aerospace manufacturers need customized packaging and material handling solutions in the production process. The largest centers of aerospace manufacturing industry are in the United States and Europe. Since most of Forza's customers are in North America, Europe is seen as more attractive in order to have market share on a geographically wider scale.

1.1 Commissioner

Forza Global Solutions S.A. de C.V. produces mainly thermoformed protection systems for class A finishes in automotive assembly lines to reduce costs in the final assembly by preventing damage to the paint surface. In addition, the company produces thermoformed solutions for transporting and handling of materials in automotive and metal mechanical industries. The production plant is located in the state of Morelos, central Mexico and the American market is served through an office in Detroit, Michigan. Forza is a stand-alone company that was established in 1998 and it has more than fifteen years of experience in the automotive sector. The company has around forty employees of which a significant amount work in innovation and development. Forza is the market leader in its main segment in the domestic market and has clients in USA, Canada, South America, Russia and Europe. Its biggest customers are the large automotive OEMs from various continents, such as General Motors, Ford, Volkswagen, Daimler and Nissan. (Forza Global Solutions 2012.)

One of the success factors of Forza is the value offering of technical assistance and protection systems for the assembly lines. Instead of producing standardized plastic protectors, they are designed according to the special needs of the client or the end user. The problematic areas in the assembly line are investigated before the product prototype is developed. To create this value offering as well as to expand into the

American market, Forza has benefited from the cooperation with TechBA, an international development program by FUMEC that consults Mexican technology businesses. (TechBA 2014.) Other competitive advantages of Forza are the highly skilled staff and technology in its technological innovation center, patented production methods, flexibility of a small company and the comparative advantage of production costs comparing to e.g. United States or Europe. As Forza is operating in a niche market, they are constantly developing their processes, materials, looking for new markets and other opportunities in order to sustain a competitive position and seek growth. (Forza Global Solutions 2012.)

The product offered for the aerospace manufacturers is thermoformed plastic packaging for parts that require special type of packaging. For instance, they can include very fine and fragile parts of aircraft that need to be transported from the aircraft part production facility to the final assembly plant. The products are designed according to each client's needs and developed from a prototype level into finished product in cooperation with the client.

1.2 Report objectives and structure

The research problem of this report is about building an overview of how the European aerospace industry is built as well as its current situation and estimated future. Also, possible key customers and competitors – including the rivalry and overview in the plastic packaging market - are described. The most important objective is to define whether the market entry into the given segment should be either planned immediately, discarded completely or investigated better. In order to take further steps, the areas of recommended investigation are discussed.

The report consists of three main parts. The first part (Chapter 2) covers market analysis, competitive strategy and market management theory. The parts were selected to match the needs of the commissioner regarding the start of this project and based on this, the most relevant questions are listed to act as guidance for the data collection. Second (Chapter 3), with the help of the theory, the data such as market trends, buyers and competitors are sought in industry-related organizations, articles, company web-

sites and publications. Third (Chapter 4), this data is analyzed based on the theory and commissioner's interests, leading to overall conclusion, recommendations and a SWOT analysis. Tables are used to report important findings.

2 Tools for market analysis

Chapter 2 consists of the theory used in the report. Theory on market analysis, market entry and competitive strategy is the basis for the later chapters which contain the actual information to be used as one part of the decision-making. The most important sources used are David Aaker's book *Strategic Market Management* from 2005 and several books from Michael Porter, such as the well-known book *Competitive Advantage* from 1985. In addition, similar theories from certain online sources such as QuickMBA are used.

2.1 Strategic Market Management

Customer analysis is seeking to find the right customer segments and their unmet needs. In case of Forza, the customer segments are aerospace manufacturers and their OEM suppliers who need help in material handling. (Aaker 2005, 39.)

One of the main tasks in the market analysis process is a competitor analysis. A competitor's sales, growth and profitability can be seen as factors in the overall performance of the rivals. In addition, the success of rivals will indicate the attractiveness of the whole market. The image of the competitor, objectives, strategy as well as the strengths and weaknesses will give us assumptions on how hard it would be to enter the desired segment. (Aaker 2005, 22.) In many cases, especially of SMEs, the key information such as financial data is difficult or even impossible to access.

The market size – total turnover - in the history, at current moment and in future is a key element in a market analysis. In order to have very detailed marketing plan, sub-markets should be taken into consideration and a company should have a strategy for them. David Aaker (2005, 23) claims that market profitability depends on five factors. The amount of current competitors and their power, possibility of new competitors as well as substitute products might weaken the profitability. The suppliers can have an impact as well, for example by increasing supply costs. The customers on the other hand can have power on influencing the price. (Aaker 2005, 23.)

The cost structure differs depending on the industry and customer segment. For example, for one customer segment the service is the most important part and for another, the material quality matters the most which means that part requires more weight on the cost structure. A clear idea of various distribution channels can help the company to estimate the overall possibility in the market. Environmental analysis can consist of technological, governmental, cultural, economic and demographic components. (Aaker 2005, 24.) An alternative approach on the same topic is commonly named as PEST or PESTLE analysis.

After analyzing the market, recommendations are given on the strategic decision whether to enter the European aerospace industry or look for alternative markets and what are the additional research topics. The recommendations can be built partially based on a few main questions presented by Aaker (2005, 40):

- What is the value proposition available
- What are the key success factors
- What competencies should be developed
- What strategies in which area should be created
- Later on, what is the strategy on manufacturing, marketing, distribution and other practical issues?

2.2 Competitive Strategy & Competitive Advantage

Rather similarly to Aaker, in the book *Competitive Advantage* (Porter 1985, 6), the attractiveness and profitability of an industry depend on five main factors as well. In the core of the industry, the existing players in the industry are competing with each other. The number of these rivals can grow in terms of possible new businesses entering the market. Substituting products or services also affect the factors to operate in the given sector. Buyers, or customers, have a very important role in determining the price, service etc. by using their bargaining power. Suppliers have their bargaining power mainly affecting the costs of raw material and other resources. (Porter 1985, 6.)

The factors mentioned can change and therefore alter the entire industry structure. An individual company, even a new entrant, can change these factors to its favor but at the same time risk the long term profitability by e.g. weakening the attractiveness of the industry for all companies. For example, in many cases aggressive price competition leads to lower profit to all rivals in the industry as buyers are not willing to pay the higher price anymore. On the other hand, the significant long-term changes in the industry might affect the market leaders the most. When considered carefully, a new entrant can use it as a weapon against them. (Porter 1985, 8.)

On a very basic level - especially for short term competitive advantage - there are two common strategies. Cost advantage gives the company the ability to adjust during the changes within the industry, such as price competition, buyer bargaining power or rising costs. The second method is differentiation. In order to differentiate oneself from the competition, a large group of buyers with an unmet need should be found and focused on this target group. Naturally, differentiation can occur in other forms, such as production techniques. In some cases, a technological innovation can present both a cost advantage and differentiation, but quite often these innovations can be imitated by the rivals sooner or later. (Porter 1985, 11.)

In order to make the competitive strategy sustainable, it should be constantly improved and alternative strategies should be considered. For instance, when a company differentiates itself by focusing on one type of service not provided by more broadly focused rivals, the risk is these possibly more powerful rivals could use their larger resources to start offering the same service as an addition to their existing variety of products and services. (Porter 1985, 21.)

2.3 Five Forces Model

In 1980, Michael E. Porter presented the Five Forces model, which made industry analysis and competitive strategy planning more efficient, or at least presenting it less complicated. While the current competition can be understood slightly easier, there are

nearly infinite number of factors deeper under the surface influencing the industry now and in the future. These forces (Porter, 1980) are:

1. Rivalry, the current competition in the industry
2. Potential threat of new competitors
3. Power of suppliers
4. Bargaining power of customers
5. Threat of substitute products including technological development.

In addition to the five forces model, Porter has presented a tool for simple categorization of industries (Porter, 1980):

1. Fragmented
2. Emerging
3. Mature
4. Declining
5. Global.

When going further into the theoretical competition models Porter has presented, these four factors can be used when determining the competitive strength of nations. They are part of his diamond model concerning the competitive strength of nations (Porter, 1985):

1. Factor Conditions
2. Demand Conditions
3. Related Industries
4. Corporate Strategy, Structure and Rivalry.

The rivalry can be measured by industry concentration. If the field is concentrated, only few players dominate the industry. The number depends on the total number of competitors – in case of hundreds of competitors, the industry can be still concentrated if ten or even twenty businesses hold significantly larger share than the rest. On the

other end, a fragmented market is more equally competitive. When the rivalry is low, the industry is considered disciplined. In case the rivalry increases and needs actions, possible actions include price changes, differentiation, distribution channel development and supplier relationship development. (Porter 1998.)

There are numerous factors that can increase rivalry. Naturally, a large number of competitors is one of the basic reasons, but in addition slow market growth or economy of scale caused by high fixed costs lead the businesses to compete for larger share. Alike companies and products and the easy chance for a customer to switch to a competitor increase the rivalry. High exit costs - e.g. the owned machinery in very specialized industry or other loss caused by the exit - intensify the competition as well. Heavily increasing rivalry in a growing market can lead to an industry shakeout where the market becomes heavily oversaturated and many of the players have to quit, leaving only the fittest to survive. (Porter 1998.)

Threat of substitutes consists of substitute products from different industry and different technology. They can affect the demand of our product by price changes or technologic changes, as well as completely new substitutes entering or discovering ones that existed before, but we did not know about. (Porter 1998.)

When there are very few buyers and many suppliers, the bargaining power of the buyer is high. For instance, in the segment of most consumer products the consumer customers have very low or if any buyer power at all, since they are very fragmented group and buy very small quantities. The largest airlines on the other hand have high buyer power, since each one present significant portion of the sales of the aircraft producers. Also, the aircraft producers have high buyer power as the number of them is low. (Porter 1998.)

Suppliers are powerful when they are concentrated or they have power to integrate, switching cost to another supplier is high or if the end user values a certain supplier important. Suppliers have little bargaining power when the buyers are concentrated and

have the chance to increase concentration or if the product is standardized and therefore much competition exists. (Porter 1998.)

In a normal competitive market situation, there is always a threat of new entrants, but entry barriers can exist as well. The existing rivals can keep the prices low to make the industry less attractive for new entrants. In some cases, government can directly regulate the industry and set barriers. Another barrier is private property rights, such as patents required to operate in the industry. Highly specialized assets, such as manufacturing equipment that needs large investment, act as an entry barrier. Also, when large economies of scale are needed to operate profitably – or in other words meet the Minimum Efficient Scale (MES) – decrease the number of potential market entrants. (Porter 1998.) The forces that define the industry structure and its competitive forces help us understand the profitability of today and anticipate the development in the long term.

When comparing the aircraft production industry to some others, the main players Boeing and Airbus have heavy competition against each other while the threat of new entrants is moderate. The customers – the airlines – do have bargaining power but on the other hand suppliers have less power. Threat of substitutes is not serious.

To determine the attractiveness or profitability of an industry, the most important competitive force or forces should be found, although reliably defining them is often challenging and can change over time. As mentioned earlier, certain strategic decisions may improve company's competitiveness in short term but weaken the whole industry in the long run. One key tool to cope with fierce competition is differentiation and adjusting strategy continuously. (Porter 2008.)

2.4 Conceptual Framework

Based on the background theory earlier in chapter two, section 2.4 defines which key elements are emphasized to be used as guidance to later collect the essential market data. The sources of theory such as Aaker's Strategic Market Management and Porter's Competitive Strategy show very similar paths with only minor differences to imple-

ment market analysis. Therefore the sources were partially combined to create the guidelines for this report. The market analysis tools presented below are adapted and modified to meet the needs of this report in order to find answers to the questions why this investigation is needed by the commissioner and what are the future actions should be.

For the first part, an environmental analysis is formed in a brief manner of PEST analysis to understand the more specific market data. The continuation of this is the information about aerospace and plastic packaging industries in Europe, such as market situation and future estimations. Predicting the future is not always reliable and even if these predictions come from possibly biased sources - such as the aerospace manufacturers - they are even more important than the current situation since in the case of Forza, the market entry and new product development project would take several quarters or even years before implementation.

Most OEM customers or buyers will be listed throughout European Union, as the number of aerospace producers is not tremendously high. The customers' geographic locations and production numbers in those locations are sought to tell us the most important regions in terms of buyer proximity. To have an idea of the bargaining power of the suppliers and buyers, approximate numbers of these stakeholders are needed.

Competitor analysis will be built of rival plastic packaging suppliers mostly in Europe. In addition, examples of rivals from outside Europe are included to give more global perspective. Some of these rivals might offer substitute products instead of direct competition. The information that is looked for includes financial figures to indicate the profitability or the market, product offering, industries served and strategic values of the firms. Possible entry barriers, such as legal requirements by governments or indirect barriers set by competitors are listed in the report. For rivalry fierceness and characteristics the number, size and market share of the competing businesses are important.

Buyers' cost structure in the logistic process is useful information to evaluate the usefulness of the project and design it better, as well as emphasize the right long-term cost savings in the possible marketing phase. However, the buyers' logistic cost structure is not publicly available and cannot be acquired in this report and therefore cannot be used to find the demand of RTP product or its design.

The last tool used is the SWOT analysis which is near the end of the report. The SWOT is done by using the environmental conditions found in this report and internal resources that have been evaluated previously in the commissioner's operations.

Table 1. Conceptual Framework in a table format

Conceptual Framework	
PEST	Europe
Aerospace manufacturing industry	Size, situation, future
Plastic packaging industry	Size, situation, future
Buyers	Description, number, locations
Competitors	Description, number, locations, materials, size, industries
SWOT	

3 Industry overview

Chapter 3 is a collection of market information. First, there is a general macro-environmental look on the chosen region to remind of the main characteristics of it. Second, the European aerospace industry trends and key figures are presented as it is the customer segment. Third subchapter takes a look at the plastic packaging industry - which is mainly Forza's competitors, but possibly partners or customers as well - key figures, situation and possible future. Later in this chapter the buyers are being listed as well as rivals and possible entry barriers.

3.1 PEST

Which external factors could affect our decision-making regarding the European aerospace industry and its suppliers? Before taking a more focused view onto the aerospace and packaging sectors, it is useful to have a general overview of the geographical circumstances in the chosen area. This general overview of macro environment is commonly known as PEST analysis, which stands for political, economic, social and technological. However, PEST analysis is usually done for an individual country. In this report, due to the nature of the given industry, choosing one country does not serve the purpose and therefore the PEST analysis is made to only give a broad overview of the whole European region. There are large number of factors and details included in the PEST analysis and they also depend on the target region and the company's own interests and internal factors. In this case, examples of relevant information include e.g. governmental investments, general economic situation, population's interest in air transport and possible new technology that might change the market. The commissioner of the thesis has a recently-made, more detailed macro environmental analysis on several European countries already. (NetMBA 2014.)

In political part, depending on the economic situation and possible conflicts, the governments might cut or increase their spending in defense aviation. Indirectly, national airlines that depend on governmental institutions might invest or postpone their aircraft purchases. Legislation is nearly constantly changing, which affects the industry by

defining e.g. working conditions and environmental laws such as emission regulations. In terms of customers, this can pose an opportunity if new efficiency or ergonomic needs can be fulfilled with the RTPs offered. Also, changes in law can change the situation of the local rivals.

During the past six years the European economy has been in a crisis. This has made businesses cut their capacity and improve efficiency, while the economy has slowly started to grow again. At the same time, interest rates and inflation remain low, which is why many businesses consider this a good time for large investments. This means that the growing demand of flights is expected to increase the demand for new aircrafts. Also, since the economy is still struggling and efficiency is looked after, there can be a demand for RTP products.

As a social factor, the increasing number of private persons travelling by air set more demand for aircraft production. On the other hand, the ongoing discussion on emissions produced by planes most likely affects decisions whether to travel by air or land inside Europe. However, quite often flying is still found more convenient and even more affordable. Also, the faster growth in air travel is in long-haul flights and in this case other travelling methods are usually not even considered. Air cargo is forecasted to grow even slightly faster than passenger traffic which is partially because of more international consumer goods market via e-commerce that requires fast delivery times, as well as shorter lead times needed by businesses.

New aircrafts have better fuel economy than old ones. Together with the heavy competition and raising income levels, it leads to growth in airline industry, which sets a higher demand for new aircrafts. On the other hand, the development of modern airships can – when successful - lead to a switch from airplanes to airships in transporting goods or even people. This can be seen as a threat for traditional aircraft producers if not followed carefully. The technological development in plastic packaging might be faster in the future, as plastic packaging is growing rapidly and more entrants look for this market. It sets a pressure to keep up the pace in innovation.

3.2 Aerospace industry in Europe

Section 3.2 contains information on the current market size and estimations on future growth overall as well as e.g. growth in each product segment. The sources include articles published by aerospace-related organizations, industrial statistics and businesses operating in this industry.

Table 2. Key findings in aerospace industry in Europe (ASD 2012; Autodesk 2014; Capgemini 2014, 18; European Commission 2009, 349; Leahy 2014.)

Findings	
Aerospace manufacturing industry	Turnover 140 billion EUR
	38% share of global revenue
	29,200 new aircrafts needed by 2032
	2008-2027 annual growth 5% passenger & 5.8% cargo aviation
	Demand for supply chain efficiency
	Reducing direct contact with tier 2 & 3 suppliers
	Suppliers need to focus on service e.g. maintenance
Buyers	Approximately 250 aerospace companies, <10 large OEMs
	Mainly Germany, UK, France, Spain, Italy
	Airbus, BAE Systems, Dassault Aviation, Saab, Finmeccanica

The table format developed in the section 2.4 is used as a template for simple presentation of key numbers and findings in the data collection. The data includes market size, growth, trends in the industry, the number of buyers and who are the key buyers. The aerospace manufacturing is a large, growing industry and Europe holds a large share of it (38%). The number of buyers is not large and the buyers are mostly concentrated in only a few countries.

In 2012, ASD reported a turnover of 188.8 billion euros for the aerospace and defense industries in Europe, of which civil aeronautics count for 81.3 billion, military aeronautics 46.2 billion and space 10.5 billion euros. Land and naval defense count for 48.8 billion, which means that aeronautics and space industries have a turnover of 140 billion. Europe represents 38% of the revenue in the global aerospace industry.

(AeroSpace and Defence Industries Association of Europe 2012.)

More than 29,200 new aircraft will be needed in 2032 comparing to 17,739 in the beginning of 2013. 10,409 of the new aircrafts will replace existing ones and 18,817 will respond to the increasing demand. The increasing demand comes largely from the growth of emerging economies and growing middle-class willing to travel by air. Long-haul flights are seen as increasing more than short-haul, leading to a bigger proportion of large aircrafts. (Leahy 2014.)

Civil aviation is expected to grow faster than defense market. From 2008 to 2027, an annual increase of 5% for passenger flights and 5.8% for cargo flights is estimated. The OEMs reduce some of their own production capabilities and rely more on suppliers. As the population in developed countries is aging and retiring, an increasing number of educated professionals come from developing countries increasing the importance of suppliers from those areas. Some of the most important things for suppliers to be successful in aerospace industry in the near future include creating, managing, exchanging product designs and processes while securing the intellectual property rights and being cost-efficient. In addition, a good cooperation with a large network of partners, customers and suppliers is important. Inside of one's own company, the integration between different functions such as engineering, manufacturing and service will help it in being competitive. Efficient, constant use of engineering data can help us in the manufacturing and service operations. Companies might have to face pressure on decreasing development times, reduce costs, increase competitiveness and product complexity. Digital prototyping methods can improve the efficiency in product development. (Autodesk 2014.)

Whereas the sources above show that significant growth is projected in the aerospace manufacturing and air travel in general, historically aircraft production is cyclical industry. For instance, between the years 1991 and 1996 as well as 2000-2003 the number of aircrafts produced decreased. However, this applies more to Boeing, which does not have manufacturing facilities in Europe. Airbus has shown more steady growth over the past thirty years. (Eurostat 2009, 300.)

Supply chain structure in aerospace manufacturing industry can be defined as OEMs who are the large manufacturers, such as Airbus. The OEMs are mainly supplied by the Tier 1 suppliers, whereas Tier 2 suppliers provide e.g. aircraft parts to the Tier 1 suppliers. Tier 3 suppliers mostly consist of SMEs providing more basic components, materials, software or services. (Eurostat 2009, 300.) Since Forza is not providing parts for the manufacturing, it could be considered as a Tier 3 supplier or even a completely separate tool supplier for material handling in the OEM's and its suppliers' manufacturing processes. (Capgemini 2014, 17.)

Large OEMs such as Airbus and Boeing are trying to reduce their own production capabilities and rely more on Tier 1 suppliers, but limit the number of these main suppliers. At the same time, they want to reduce direct contact with Tier 2 and 3 suppliers. (Capgemini 2014, 18.)

Future trends in the manufacturing process say that the usage of composites has increased and is seen to increase more. Also, carbon- and fiberglass-reinforced plastic (CFRP and GFRP) are being used as well. The Airbus A380 has been using 20-22% of composites by weight together with the use of GLARE (fiberglass-reinforced aluminum alloy). (Capgemini 2014, 18-20.) As in almost any other industry, globalization has its effect on aerospace manufacturing industry as well. Capgemini (2014, 20-21) mentions India, Brazil, Mexico and Turkey will have increasing importance in the supply chain.

To face the changes in the industry, Capgemini recommends the large manufacturers to use the new innovations to stay ahead of the new players from developing industries. They also recommend to reduce development cycles and secure the intellectual property rights. The production process and the supplier importance should be integrated. More weight on service sector, such as Maintenance, Repair and Overhaul (MRO) should be implemented to create more revenue and long-term contracts. As a crucial part for Forza, a common idea of increasing cost-reduction is recommended for the aircraft manufacturers and suppliers. (2014, 22.)

3.3 Buyers

According to European Commission (2009, 349) there are approximately 250 aerospace companies in the European Union. In this chapter, the largest aircraft OEM producers are listed and each company's operations in different regions and countries are divided by country. The countries with most aerospace manufacturing are Germany, France and United Kingdom. Spain and Italy also have a considerable amount of operations.

Airbus

Germany

In Hamburg, Airbus implements the assembly of fuselage sections, the final assembly of the A320 family aircraft and A380 major component assembly. Also, rear fuselage sections for A330 and A350 XWB are manufactured there. Hamburg facilities have around 15,000 employees. In Bremen plant, with around 3,000 employees, Airbus designs and manufactures high-lift systems for aircraft wings of all models. They also develop and manufacture the integrated fuselage assembly for the A400M military aircraft. At their 1,800-employee Stade plant, Airbus produces vertical tail planes of all aircrafts, as well as other carbon fiber reinforced plastic parts. These parts include flaps for A320 family and spoilers for the A330. In addition, they make pressure bulkheads for A330 and A380. For the A350 XWB aircraft, Stade makes upper wing shells, vertical tail planes and fuselage shells. The plant in Buxtehude designs and produces all electronic communication and cabin management systems, including the cabin intercommunication data system (CIDS) as well as passenger seat controls. The workforce consists of 350 people. (Airbus 2014.)

France

The Toulouse plant is responsible for engineering, structure testing and materials processes, A400M design, flight tests and it is one of the three Airbus delivery centers. The final assembly for models A320, A350 XWB, A330 and A380 is done in Toulouse as well. Toulouse is the home of Airbus group headquarters. Toulouse Saint-Eloi pro-

vides pylon and nacelle components for the assembly lines of all Airbus aircrafts. Approximately 11,500 employees work for Airbus in Toulouse area. Saint-Nazaire has a plant does structural assembly and equipping front and central fuselage for all aircrafts. It employs around 2,300 people. Nantes plant produces center wing boxes for all aircraft models as well as various CFRP parts. It also produces radomes, ailerons and air inlets for various aircrafts. Nantes facilities have around 2,000 employees. (Airbus 2014.)

UK

In Broughton, North Wales, wings are produced for the entire Airbus aircraft line. Filton has an engineering and R&D center for wing design, landing gear and fuel systems as well as manufacturing and assembly of A400M wing components. (Airbus 2014.)

Spain

Getafe plant does engineering, design, production and assembly of aeronautical components. It supplies the final assembly lines in Hamburg and Toulouse. In Illescas, Airbus makes mainly the large or complex parts and components such as stabilizers, rudders, spars, sections of rear fuselage etc. As Illescas, also the Puerto Real plant is responsible for automated assembly of moving parts, such as rudders and spars and large or complex parts. For instance, the A380 fuselage horizontal tail plane and belly fairing. Seville has the assembly line of Airbus Defence and Space products. In Madrid, Airbus Defence and Space does the military tanker outfitting. (Airbus 2014.)

BAE Systems

BAE Systems is one of the biggest employers in UK. The combat aircraft Typhoon for UK is being assembled by BAE System, as well as the production of its canopy, windscreen, front fuselage and foreplanes. Another military aircraft by BAE Systems is the F-35 Lightning II, with planned future production of 3,000 aircrafts. The sales of Eurofighter Typhoon have been lower than expected, which is why BAE Systems is un-

der pressure of closing plants in UK. The company has production facilities in Warton and Samlesbury. (BAE Systems 2014.)

Dassault Aviation

A subsidiary of the French Dassault Group with its headquarters in Saint-Cloud. Dassault produces combat fighters and business jets with trademarks of Rafale, Falcon, nEUROn and Mirage. The company has 11,600 employees of which 9,000 are in France. Seclin plant has around 280 employees and it produces large mechanical parts such as wing panels and fuselage frames. Argenteuil plant has more than 1,000 employees producing forward fuselages and metallic primary parts. Argonay plant produces flight control systems and their maintenance operations. It has around 500 employees. At Poitiers, 132 staff members make military plane components, such as canopies, pyrotechnic equipment, assembly of composite subassemblies and titanium and alloy parts. Merignac has 1,300 employees and it does the final assembly of all military and civil aircrafts in series production. In addition, its main activities include industry management and procurement. Martignas has the workforce of 500 people. The assembly of wings for all aircrafts takes place there. In Biarritz, Dassault has more than 1,050 people working. The facilities manufacture composite elements, as well as fuselages, fin and winglets for Falcon and Rafale aircrafts. They also manufacture steel and titanium parts. (Dassault Aviation 2014.)

Saab

Saab AB has its headquarters in Stockholm and manufacturing facility in Linköping. Nowadays Saab produces only military aircrafts. (New World Encyclopedia 2014.)

Finmeccanica

Their brand Alenia Aermacchi produces military training aircrafts in Venegono Superiore (Varese province, Italy). It has around 1,800 employees. It has plants also in Nola, Monteiasi-Grottaglie and Foggia. In addition to the brand's own planes, Finmeccanica supplies parts for other aircraft manufacturers such as Airbus, Boeing, Dassault and Bombardier. (Alenia Aermacchi 2014.)

3.4 Plastic packaging in Europe

This chapter contains key figures on plastic packaging industry in Europe, with Germany as an example country since it has very large plastic packaging sector, as well as aerospace sector. Similarly to the previous chapter, this one also has key figures and notes on current market situation and future estimations. The information is gathered from plastic packaging related websites, key businesses in the sector and statistics.

Table 3. Key findings in the European plastic packaging industry (Eurostat 2009, 185-187; European Plastics News, 2012; GPA, 2014; Plastics Europe, 2013; RPA, 2013.)

Findings	
Plastic packaging industry	Global RTP market 5 billion USD
	Estimated annual growth 6.1%
	All European packaging market 127 billion EUR, 36% plastic
	Concentrated industry
	Average staff cost 29.9 thousand EUR per person
Competitors	8600 plastic packaging companies in Europe in 2006. Turnover 42 billion EUR
	Logistics service offering in many industries & long experience
	Largest shares in Germany, UK, France, Italy
	Plastic, metal, cardboard, wood
	6 important European rivals listed
	Rivals outside Europe listed

Table 3 presents the key findings, such as market size, staff costs, number of rivals, materials and geographic concentration. The packaging market is growing and the use of plastic is increasing comparing to other materials. The number of rivals is high limiting the supplier power. The industry is concentrated among the large packaging suppliers who use several materials. Six key rivals in Europe as well as examples of non-European rivals are listed in the section 3.5.

The German plastic packaging association Industrievereinigung Kunststoffverpackungen (Page 2011) predicts that cost of raw materials and energy lead to higher expenses in plastic packaging in the near future. However, their recent study shows that businesses in the given industry see the future bright. (Interpack 2014.) In addition, the world-leader in plastic returnable transit packaging, Schoeller Allibert,

claims the usage of this type of product is increasing in order to reduce costs and environmental impact in logistics. (Packaging Europe 2013.) Overall, plastic packaging is projected to grow faster than other types of packaging, leading to larger percentage on the packaging industry. (Page 2011.)

Globally, RTP market was around five billion in 2012 and is projected to have compound annual growth rate of 6.1%, reaching 6.75 billion US dollars by 2017. (RPA 2013.) In Europe, the whole packaging market is estimated as 127 billion US dollars. Paper is the most used material with a share of 42% and the second most used is plastic with 36%. (GPA 2014.) The flexible packaging market in Europe valued at 11.6 billion euros in 2011. Sixty percent of this market is ruled by top twenty suppliers. As explained in the theory, this makes the market rather concentrated and new entrants might have difficulty in meeting the high volume demand of the customer. However, this applies more in the high-volume sectors, such as consumer goods. (European Plastics News 2012.)

RTPs can be used as a part of company's corporate social responsibility in terms of protecting the environment by reducing waste and creating better working conditions by more ergonomic and safe material handling. Since cost advantage is one of the most commonly aimed competitive advantages in general, especially in the economic crisis times the cost structure of supply chain is usually investigated and using RTPs can offer savings in the long run. (Research and Markets 2012.)

In 2007, the EU, Norway and Switzerland altogether produced 65.6 million metric tons of plastics and 37% of it was for packaging. In 2006, there were 8600 enterprises producing plastic packing goods within the European Union. Their total turnover was 41,856 million euros. (Eurostat 2009, 185.) In comparison to Eurostat's (2009, 185) figures from 2007, the numbers seem to have changed in 2012 according to PlasticsEurope (2013). In 2012 from all plastic production in Europe, 45.9 million metric tons, 39.4% was used for different types of packaging. (PlasticsEurope 2013.)

In order to have a picture of the cost structure in the European plastic packaging sector, Eurostat (2009, 186) tells us some key figures. The countries with the highest share of production in EU are Germany, United Kingdom, France and Italy. Since most aerospace enterprises are located in these countries, the plastic suppliers have a clear advantage of proximity to the customers. However, the personnel costs are significantly higher than in Mexico as the average cost per person is 29.9 thousand euros. On the other end of the comparison, for instance Czech Republic does have a significant plastics industry but with average personnel costs of only two thousand euros. (Eurostat 2009, 187.)

In order to have an example of sales of the plastic packaging in an individual country within European Union, in Germany in the years 2011-2013 the annual total sales of all types of plastic packaging sums up between thirteen and fourteen billion euros. About one third of this is for the German industrial and transport market. However, this allocation is higher in Germany than many other European countries due to the high amount of industrial manufacturing and transport. (IK 2014.)

3.5 Competitors

The competition chapter defines the key rivals from various countries and e.g. their market specialization, product type, possible financial figures and other. The biggest key rivals are located within European Union, but the chapter also includes short descriptions of smaller competitors in Europe as well as from other regions, such as China, India and United States.

Europe

Cartolux-Thiers

As a part of plastics group Top Clean Packaging, Cartolux-Thiers is a French company offering thermoformed plastic packaging products since thirty years and it has been in packaging market for eighty years. It has ISO 9001, 2000 and 14001 certificates in thermoforming. As industries it serves mostly, the company mentions automotive, medical, cosmetics and food. It claims to be one of the European leaders in thermoforming. Cartolux-Thiers' advantage is the cooperation of the five companies in

Top Clean Packaging group. The different technologies make it possible to offer the customer several types of packaging solutions as one supplier. Aircraft manufacturers would like to reduce the number of their suppliers. As many other rivals do, Cartolux-Thiers does follow-up service on all stages of the project. (Cartolux-Thiers 2014.)

Schoeller Allibert

With more than sixty years of experience in packaging industry, headquarters in the Netherlands and branches around the world and over thousand employees, Schoeller Allibert says it is the world's largest manufacturer of returnable plastic packaging for material handling. The company can take care of whole logistics process from cost analysis to recycling the materials. This value added service is its tool in the competition. In Schoeller Allibert's press release it claims to use aerospace technology in RTP (returnable transit packaging) as well as implementing various material testing methods to ensure the quality of end product. (Schoeller Allibert 2014.) Providing the packaging solutions for aerospace industry is also mentioned, but mainly the company serves agriculture, automotive and food industry. In addition to the customized solutions, it has produce-to-stock items as well, such as plastic containers and trays. (Schoeller Allibert 2014.) The group's turnover in 2012 was 514 million euros and the main value is sustainability by the closed-loop logistic solution. (Schoeller Allibert 2014.)

DS Smith

With several facilities in UK, DS Smith offers customized packaging solutions and one of its specializations is automotive industry, for instance packaging for engines or windshields. Instead of using only plastic as Forza does, the company uses mostly heavy duty cardboard which can be considered a substitute product. (DS Smith 2014.) DS Smith claims to be a leader in customer-specific packaging industry in Europe. The company employs around 20,000 people, has representation in twenty five countries and it is listed in London Stock exchange. DS Smith offers service, quality and long term strategy in packaging ecosystem. The company says it is a Supply Cycle Strategist, offering a large variety of packaging in many industries and many geographical areas. Comparing to e.g. Forza, it is very large enterprise in its field. (DS Smith 2014.)

Although main focus is on the more common cardboard packaging, DS Smith produces several types of plastic packaging as well, including returnable transit packaging. In addition, foam packaging is offered. The website mentions the markets where the company serves these plastic products, for instance automotive and healthcare industries. However, aerospace industry is not mentioned. According to the company's own reports, it has achieved organic growth and gaining market share. The volume growth of 2013/2014 is 2.2% which is said to be faster than the industry average. DS Smith's revenue is £ 4,035 million and operating profit £ 307 million, return on average capital employed 13.0%. In the report, the company is investing more in the plastics department and sees growth there. Variable costs total £ 2,895 million and fixed costs total £ 864 million. (DS Smith 2014.)

GWP Group

GWP Group is a British company that was established in 1990 serving several industries, including aerospace. It has around hundred employees and sales turnover of nine billion British pounds. It uses mainly cardboard in its products as well as foam when more protection is needed. (GWP Group 2014.)

Nefab

It has its headquarters in Sweden and locations in thirty countries around the world. One of Nefab's specializations is aerospace industry (aerospace OEMs, sub-suppliers, MRO providers) in Europe. It uses mostly collapsible nail-less plywood boxes and VCI bags. Nefab group has around 2,700 employees and turnover of SEK 2,9 billion in 2013. The group's objective is to grow by offering products in various categories, entering new markets and industries, following existing customers' expansion and possible acquisition of high service packaging companies. (Nefab 2014.)

Eco Der Thermoformer

It is a German thermoforming company which competes with Forza in the automotive protector industry as well as producing returnable transit packaging and other plastic packaging products. It has more than forty years of experience in the industry. The examples of customers do not mention aerospace manufacturing industry as such, but

Eco Der Thermoformer does serve airline sector, such as Lufthansa Cargo. (Eco Der Thermoformer 2014.)

Outside Europe

Pregis is headquartered in the United States and serves various industries, including aerospace industry. However, its product can be seen as a substitute for the customized thermoformed RTPs that Forza offers. The company produces IntelliPack cushioning system for fragile items. The cushioning can be custom-made to fit various types of packaging and therefore e.g. combined with traditional, disposable cardboard packaging. (Packaging Europe 2012.)

Another competitor in the United States, Allied Plastic Inc. offers thermoforming solutions in reusable packaging and other customized products. It claims to be a global leader in its industry, although it does not have operations in Europe. (Allied Plastic 2014.) Comparing to the giants such as DS Smith, Allied Plastic is rather small with 200-500 employees. (Indeed 2014.) However, its sales have increased 15 million US dollars annually since 2009. Their production strategy starts with making a 2D model, then a 3D model and finally a finished prototype. (YouTube 2014.)

Also in the United States, among many other thermoformers, TriEnda claims to be one of the biggest industrial plastic manufacturers in North America. It specializes in the heavy duty packaging and material handling solutions and serves several automotive manufacturers. According to its website, it has customers in Europe too. (TriEnda 2014.)

As a price example of rather generic plastic trays in high volumes in United States, Reliant Group is a company based in New Jersey and has price of US \$0.05 - 1.5 per unit but the minimum quantity is as high as 25,000 pieces and it has the supply ability of up to 100,000 pieces. Payment with a letter of credit. (Alibaba.com 2014.)

TD Termo Design S de RL MI is a national competitor of Forza offering the same kind of products using similar production methods such as thermoforming plastic. However, it does not have a website in any other language than Spanish. It does not mention having clients in Europe or anywhere else outside Mexico either. (TD Termo Design 2014.)

When we take a look at Chinese suppliers and their prices, Jiangmen Xinhui Ruiding Blister Packing Co., Ltd. offers rather thin (0.20-0.60mm) thermoformed customized trays for US \$0.16 - 0.68 / Piece with delivery term FOB and minimum order quantity of 6,000 pieces. The 3D sample is told to be available in 1-2 days and delivery in 10-20 days. Payment terms are wire transfer and Western Union. Its supply ability is 10,000 pieces per day. (Alibaba.com 2014.) However, these trays are thin, blister-type packaging for lighter goods. For thicker trays, Shenzhen Zhenrong Plastic Co., Ltd. has the price range of \$3-10 and minimum quantity of 500 pieces and delivery time of 10-40 days. These prices and terms are typical for several Chinese suppliers at Alibaba.com. (Alibaba.com 2014.)

Europack manufactures a large variety of plastic packaging and material handling products in India. The materials it uses are PVC, ABS, PP, HIPS, PET or acryl. Payment is with documents against payment or wire transfer. FOB price per unit is \$1 USD with the minimum quantity of 10,000 pieces and delivery time of 3 weeks. (Europack 2014.)

Competition conclusion

A common feature in many of the big players' strategy is to offer complete packaging service or even a whole logistics process. This fits the trend of limiting the number of suppliers in the aerospace manufacturing industry. Naturally, the biggest companies have been in the packaging industry for decades and some of them almost a century. The sector is growing, which attracts even larger number of competitors. Increased rivalry or even bigger change in the market structure are therefore possible. These large companies usually serve vast scale of different industries. In addition, there are plastic

packaging suppliers from outside Europe, such as China, who compete with aggressive pricing.

3.6 Entry barriers

Although Forza has lower production costs in Mexico than its European rivals, many of these competitors have higher volumes and closer location to customers which give them an ability to keep their prices competitive. The brand or reputation of the current rivals is an obstacle which has to be overcome as a new entrant by convincing the buyers to choose Forza by having enough competitive advantages over the rivals. The OEMs' trend of reducing direct contact with Tier 2 & 3 suppliers makes it more difficult to reach the OEMs directly and as they might set certain requirements on their Tier 2 & 3 suppliers, the process of entering the supply chain is becoming increasingly challenging. Supporting the same idea, McGuire (2011, 5) says that in the area of complex products and services, high level of coordination, cooperation and arrangements go throughout the supply chain.

Forza does have the necessary machinery to produce the thermoformed plastic packaging materials and therefore large investment in machinery is not seen as an entry barrier. On other hand, Forza's production capacity is limited, which sets a challenge in meeting the Minimum Efficient Scale. In addition, the company would need to allocate its resources on studying the aerospace production process, materials and transport before designing the packaging systems.

The European Union Directive 94/62/EC sets the recycling percentage of 22.5 % for plastic packaging. As Forza offers returnable transit packaging, this sets no difficulty to achieve. In addition, the packaging must indicate the material used. Otherwise, there are no strict regulations on the given type of product. (Europa.eu 2011.)

4 Findings

This chapter concludes the most important findings in the previous chapters on market data and presents the final recommendations for further actions.

Air traffic is growing and setting a demand for new aircrafts, and old aircraft need to be replaced due to tighter environmental regulations and increasing fuel costs. Therefore, the aircraft production should continue its growth. At the same time, the manufacturers look for more efficiency in the production and supply chain process. This leads to a growing market in Returnable Transit Packaging in aerospace industry. In the RTP sector, plastic is an increasingly important and cost-efficient material due to recycling and other environmental issues. Highly developed, customized thermoformed plastic packaging for material handling is considered to give long-term cost advantage, shorter lead times, less damage to the goods and better working environment. Considering this, there is a large, growing market for the RTP products or services.

However, fierce competition seems to exist in this segment. There are close to ten thousand plastic packing suppliers in the EU and the market is rather concentrated among less than twenty key players holding the majority of the market share. The key players are located in the European Union and they have long experience in their field as well as well-established brand names. These important rivals have resources and production capacity to serve the customer a complete solution on material handling and RTP. This goes hand in hand with the strategy of aerospace producers to limit the number of suppliers. Forza is rather young enterprise and does not have long experience in the European market, neither in RTP or aerospace sector as its main focus has been the protectors in automotive industry. On the other hand, Forza can compete with the flexibility of a small enterprise and significantly lower production costs.

Most of the possible customers have their production sites located in France, Germany, United Kingdom, as well as some of them in Spain and Italy. In case the market entry is considered, it is good to keep in mind that the majority of automotive manu-

factors are also based in these countries and therefore both, the automotive and aerospace customers could be served from one office. However, it would be beneficial to have established operations – in terms of sales, customer service, brand etc. – in the automotive sector before starting to reach the aerospace sector.

Considering the findings throughout the process, entering the RTP market in the European aerospace industry is challenging due to the complex supply chain structure, rivalry and buyers' bargaining power and therefore requires careful strategy but the market is large posing a huge opportunity. The section 4.2 defines the topics which should be researched in order to make the decision and move forward to planning the market entry.

4.1 SWOT

SWOT is a situational analysis tool used for decades to help with strategic alternatives in various types of business levels as well as for individual people. The strengths and weaknesses present the internal side of SWOT and includes – for instance – financial, human and other resources, market share, brand awareness and production capacity among others. Opportunities and threats make the external part, e.g. changing market trends, customers, competitors, technology and so on. (NetMBA 2014.)

Although SWOT is a practical and widely used tool, it is good to bear in mind it only acts as a checklist to further investigate the points listed. In addition, many items fit both sides, such as one market change can be both opportunity and a threat. This SWOT analysis was built as the last part of the report to act as an easy-to-approach checklist and conclusion.

Table 5. SWOT Analysis Forza Global Solutions

SWOT Analysis Forza Global Solutions	
Strengths	Weaknesses
Flexibility of a small enterprise	Market entry from scratch
Innovation of materials & production	Lack of experience in European market
Comparative cost advantage	Limited production volume
Digital prototyping	Lack of efficient control of projects
Material recycling	Dependency of manual labor
Opportunities	Threats
Large aerospace industry in Europe	Distance between Mexico and Europe
Combining automotive and aerospace	Losing reputation in case of obstacles
Business diversification	Cyclical aerospace industry
Growing aerospace & packaging markets	Prolonging economy or other crisis in Europe
Leverage of improving economy	Increasing material cost
Increasing aerospace supply from Mexico	Difficulty of contacting OEMs
	Increasingly concentrated market and rivalry
	Substitute products such as cardboard packaging

Table 5 points out the internal (strengths, weaknesses) and external (opportunities, threats) factors regarding Forza’s possible market entry. These factors are discussed in the text in the section 4.2.

Strengths

Years of working with the automotive industry has given Forza the advantage of being a small company with flexibility to meet the customer’s demands in e.g. changing product design with fast response time. The company has a strong focus on developing new products, materials and production techniques in its innovation department. Thus, competitive advantages can be sought via e.g. production cost advantage or product differentiation and when this is done constantly, these competitive advantages can be considered sustainable. Although RTP in European aerospace sector is new for Forza, it should be mentioned that the company is the market leader in its main product category – automotive protectors - in the domestic market and its material handling solutions are already used in automotive manufacturing. The production cost is a comparative advantage comparing to the European rivals, as with the production based in Mexico, the cost of labor, material and machinery are generally lower than in Europe. In terms of logistics, Forza has established export operations to various countries, such

as United States, Russia and Venezuela. The materials used are recycled and recyclable which is important in today's environmental regulations and corporate social responsibility. One of the success factors seen to become more essential in near future is digital prototyping which Forza is implementing already.

Weaknesses

This market entry would have to be started almost from the scratch, with no contacts, product examples, references, marketing materials etc. and the company does not have much experience in European market in general. Also, lack of vast experience in Europe sets some limits on the knowledge of the market characteristics, business customs, languages skills and other. Although the company holds large market share in e.g. Mexico and US, in Europe it does not have established customer base nor a brand. Forza's production capacity is limited which can cause difficulties in meeting the minimum economy of scale or other cases of high volumes in production. According to the internal sources, the planning, controlling and evaluation of projects lacks efficiency which increases the risk of project delays, quality issues or increased production costs. Also, the production process is highly dependable on manual labor which is constantly changing and new staff always require certain training.

Opportunities

As seen in the previous chapters, aerospace industry is a large industry and Europe is a vast concentration of aerospace. Entering this market segment could be combined with the European automotive industry sales, such as using one representative for both customer segments or creating a mutual brand in all customized thermoformed products. Successfully entering Europe and RTP would diversify Forza's operations to reduce the risk of unfavorable changes in one market area and product segment. Thermoformed plastic manufacturing and product development requires certain investment in e.g. machinery which acts as an entry barrier to decrease the number of new entrants. Both aerospace and plastic packaging industries are expected to continue growing in the future. In the aerospace, the biggest growth is expected in civil cargo traffic, focusing more on the large long-haul planes. After six years, the European economy is currently standing still after the financial crisis and recession but it is expected to start

growing in the future and that can add leverage to the increasing demand of aerospace and RTP products. Since legislation is constantly changing, it is possible that the European rivals' labor condition laws change and for instance, increase their production costs comparing to Mexico. However, this can happen in Mexico as well. Forza's plan is not to provide parts used for production which have strict requirements and entering the distribution channel is difficult. Instead, as a Tier 3 or completely external vendor, introduction and closing sales can be easier and requirements in quality, certificates etc. are lower. A positive thing for Forza is the growth of aerospace supply in Mexico, which increases the importance of the suppliers from this area.

Threats

If the same level of service, in e.g. maintenance, is offered as with the automotive product segment, the logistics and travel costs can raise significantly in case of failure in product design or incorrect usage by the end-user. As a new entrant in the market or segment, problems can cause lost reputation which is difficult to recover. The long geographical distance can cause other issues as well, such as too high logistics and travel costs and communication issues considering the distance and time zones. Although the future of both aerospace and plastic packaging are seen bright, aerospace is a cyclical industry and current economic times can cause decreasing demand or at least decreasing growth in demand. In addition, one of the findings about plastic industry was that raw material costs are expected to rise. Laws and regulations, such as plastic material regulations or import requirements can always be modified by the European Union or an individual country, although in this type of product there should not be any threat of heavy changes. The difference in languages and culture create the risk of communication failures when contacting stakeholders and creating relationships with them and these misunderstandings can lead the customer or other stakeholder to choose another partner. In large organizations, such as Airbus, the process of negotiation and purchase planning usually takes a lot longer time than in smaller businesses. There are many competitors and many of them are very large enterprises with decades of experience, well-known brands, and larger production capacity including the possibility to offer complete logistics solutions for the tier one and tier two suppliers as well as OEMs in aerospace sector. When this is the trend appreciated by the buyer as well,

the industry will become more concentrated. Since both aerospace and plastic packaging are seen as growing sectors, it might attract even more competitors to enter the market, making the rivalry more intense and increasing the bargaining power of suppliers and buyers. Increasing raw material costs, increasing rivalry and new technologies might lead to substitute products.

4.2 Further research topics and strategic recommendations

As the scope of this report does not cover all aspects to reliably decide to enter the given market segment and start actual marketing planning, this topic presents research topics that were not covered or were only covered superficially and therefore should be investigated deeper. In addition, recommendations on competitive strategies are given in the end of the section.

Table 4. Recommended research topics

Recommended research topics
North American market (United States, Mexico)
Product differentiation
RTP usage of aerospace producers
Supply Chain efficiency of aerospace producers
Competition prices
Minimum Efficient Scale & production volume
Tier 1 & 2 suppliers of aerospace producers

Table 4 lists the recommended additional research topics to develop an expansion strategy. These areas of research are explained in the section 4.2.

As an alternative expansion strategy, Forza Global Solutions should investigate the aerospace and plastic packaging industry in the United States, which can be considered as big as its European equivalent. In addition, aerospace manufacturing is expected to grow in the near future in Mexico and therefore the given market segment will grow in Forza's domestic market as well.

Differentiation in product design, service or distribution channels should be investigated and carefully planned in order to consider entering the new market. Since the RTP market in aerospace has fierce competition, direct entry is challenging, but one option would be an alliance with the big players to use their distribution channels.

Although it was stated that some packaging suppliers are already providing plastic or other returnable transit packaging to aerospace producers, this topic should be researched qualitatively inside the circle of aerospace producers. It may require personal contacts in these businesses, but e.g. interview with the production or logistics engineers or managers would explain how much these products are used in reality. Other essential data would be the product's effect on lead times in logistics or production, decreased amount of damage to the goods, improved working conditions, long-term savings in packaging among the other benefits of using the product. In addition, the lifespan or areas of improvement could be found out and with this data, Forza could differentiate its product from the ones used already.

In case of businesses or certain operations within a buyer where the given product is not used, a research on their supply chain processes could be done to find areas where the operational efficiency could be improved by developing a thermoformed custom packaging solution. This type of research also requires close cooperation with the buyer, which means their interest have to be triggered in the very early phase. By interviewing the possible buyers, their desired order amounts would be discovered to find out if Forza has enough production capacity at the moment or if it would require investments.

The report has examples of rival price levels, but the prices mentioned do not present precisely same type of product and they are not from European suppliers. Studying the prices, service, material and cost structure of their RTP projects would help Forza to make feasibility and investment calculations. Also, since many of the rivals are large and the market is concentrated, further competitor research should answer the question of minimum efficient scale of sales volume.

Earlier in the report we saw that the aerospace producers are naturally willing to increase their supply chain efficiency, but also reduce direct contact with tier two and three suppliers. This report only discusses the plastic packaging market and does not cover the tier one or two suppliers of the aerospace producers, which is why these suppliers should be researched in order to consider them as a buyer segment instead of the OEMs as OEMs are assumingly harder to contact as a new supplier. An example of the suitable supplier could be a producer of a fragile aircraft component that is used directly in the aircraft assembly line.

As Porter (1985, 11) defined, one of the most important competitive assets is the cost advantage. Forza is using the comparatively lower production cost against the rivals in its most important product segments and by studying the cost structure in rival plastic packaging system providers in aerospace industry, the cost advantage can be used for the new market entry to offer competitive pricing for the buyers and sufficient profit margin for Forza. Overly aggressive discount prices cannot be recommended since such action can weaken the long-term profitability of the whole market and therefore harm Forza itself at a later stage.

Another strategy is differentiation in the product itself (Porter 1985, 12) and production techniques. The most used material in packaging is still cardboard and although the usage of plastic is increasing the fastest, thermoformed packaging systems are still a minority. Therefore, Forza should take the advantage of its differentiation in product material as well as patented production technique and implement the same strategy in the aerospace industry. Since the importance of technologic assistance and service has been one of the success factors in Forza's growth in automotive industry, the same value offering should be included in the aerospace marketing planning.

There are a number of exporting strategies in various entry modes, such as serving the market from Mexico, establishing a sales office in Europe, cooperating with the current large rivals or the aerospace suppliers and so on. (Delaney 1998, 70.) As the supply chain structure in aerospace is complex and contacting the OEMs directly may be difficult, alternatives for the direct market entry should be considered. For instance, co-

operation with existing rivals would help Forza to overcome the lack of reputation by using a successful packaging solution provider's brand via licensing or joint venture. However, this would mean lower profit margin and Forza's own brand would not be developed. Before beginning the possible direct export to European market with Forza's own brand, the company could first introduce the thermoformed plastic packaging solutions to the domestic market in order to build up a reputation and gain experience about the needs and problem areas in the aerospace suppliers' production processes.

4.3 Process discussion

Finding relevant market information about aerospace industry turned out to be more difficult and especially time consuming than expected. For instance, when compared to automotive industry, aerospace sector seems more closed in terms of available data on the companies' operations and technology, previous studies or manufacturing related news. A lot of background information studied was excluded from this document to avoid a very inconsistent structure.

Although there is a brief PEST analysis of European region included, it does not play an important role since the number of aerospace manufacturers is not very high and the production plants are scattered across several European countries. A PEST analysis should be done for individual countries. Instead, a more detailed environmental analysis of certain European countries was conducted in Forza for another project recently, which makes it unnecessary to repeat.

Conducting this report as desk study sets limitations on some areas of information, such as the exact number about the current usage of the given type of thermoformed plastic RTPs among the aerospace manufacturers. This type of data could have been gathered only by contacts in these companies. Collecting primary data by interviewing the companies would have had to be planned before beginning the process. However, the purpose of this report is to act as an introduction to the given field and help determining whether further investigation – including to understand which parts need deeper look - and actual market entry plans should be implemented. In addition, with very limited resources the scope of the study had to be set narrow enough. As some

sources say, the OEMs are reducing direct contact with Tier 2 & 3 suppliers. If this was known in the planning process of the thesis, the Tier 2 & 3 suppliers would have been studied as a customer segment.

The thesis process started in the winter 2014 and the initial goal was to finish it in early summer 2014. Due to heavy work load apart from the thesis and the surprising lack of data, a new goal was to finish the thesis during the early fall semester 2014. Most of the work was done during the summer. Originally, changing this goal to early fall was considered a plan B. In the beginning of the process, I tried to schedule the writing to meet the first goal, but considering the details, changing the plan was a better option in the end. As in any other case of timetable change, moving from the plan A to plan B made me think carefully how to plan general time management and prioritizing.

More than two years ago, when I completed the thesis writing course, I was told writing thesis in teams of two or more is generally not a good idea and can lead to failure and even breaks relationships. Now I have seen several successful theses written in teams of two and afterwards, I would have been happy doing so as well to share ideas, divide responsibilities and work more efficiently.

While writing this report, I have gained knowledge on aerospace industry, plastic packaging industry and returnable transit packaging. As these are considered as emerging sectors, in the ideal case I will benefit from this knowledge in the future. In addition, spending large number of hours in searching relevant data from sources of all kinds has enhanced my searching skills and critical thinking about which sources might be biased, outdated, misleading or in the best case, very useful. Although aerospace industry surely is an interesting area for many including myself, writing this report only made me more curious on several additional topics to gain deeper understanding of the industry.

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