Final Paper: Cost-benefit analysis of a partnership for Fly Aeolus

A study of a model for conducting a cost-benefit analysis with different future based scenarios for an airline company in the segment of personal air travel looking to start an alliance.

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Based on the Evaluation of Infrastructure projects; Guidelines for Cost-Benefits Analysis in this study a cost-benefit model has been designed for airlines in the personal aviation segment wishing to enter into a collaboration with another airline. The distinction has been made between the additional costs that such an alliance entails, the revenue that the extra flights produce as well as the knowledge that a cooperation of both parties can provide. To determine revenue and expenditure for the longer term, fifteen years, a growth curve was used, based on the product life cycle. We should also take into account the fact that an exchange of knowledge can have additional benefits when entering into a collaboration. This can not be expressed financially and is therefore included as Pro Memoria post.

All information collected will support the user of the model in making a decision concerning entering into an alliance.

1 Introduction

Partnerships within traditional aviation have been commonplace for decades. For the traditional airlines gains appeared to be in the areas of cost, customers and knowledge (Czipura, 2007 and Kleymann and Seristo, 2004 and Oum, 1997). This was proven also in an earlier study done in late 2009 by De Boer of Fly Aeolus mission. This is a small fractional ownership company located in the segment of private aviation. The demand for this research came from Fly Aeolus due to the successes of partnerships in traditional aviation. These motivated to look at the opportunities within the personal aviation.

Within such a partnership, several factors are present that could influence the results of it. Because it involves the future, a long term partnership determining the progress and impact of these factors are very uncertain. The parties involved deciding on the partnership ant to minimize these uncertainties. Less uncertainty definitively means less risk. This research will attempt to overcome and reduce these uncertainties. There are several possible methods. This research has chosen to do so by using a cost-benefit analysis. The reason is that it is believed that one of the main reasons for partnerships within aviation in the personal aviation segment, is to obtain more customers and thus higher revenue. Concerning the results of this research it needs to be emphasized that these are just guidelines. With certainty it can be assumed that the actual values will deviate from the results, due to the uncertainties of the long term of the forecast.

The main question which is central in this research concerning the model of a cost-benefit analysis, has been formulated as follows:

> *How does a model look like for an airline in the personal segment of aviation wanting to start an alliance where estimates can be given of the financial impact on this company for a growth- and growth stagnation scenario?*

This question will be answered using specific knowledge gaps. These have partially been defined in De Boer (2009) as relevant to this problem.

- How many customers will an alliance produce?
- How will the growth in customer demand develop?
- What distance will the targeted group fly on average?
- How many customers will be on each flight?
- What is the average ticket price per flight?
- What is the startup cost of a partnership?
- What are the annual costs involved?
- Will extra staff have to be hired due to the growth?
- How can knowledge in the CBA be included?

This model will subsequently be used for the client Fly Aeolus to look at what it would mean if they would enter into a partnership with a traditional airline, as defined in De Boer (2009). This result is displayed in a cost-benefit analysis, with economic growth and stagnation scenario taken into account. These results can help Fly Aeolus when making a decision on whether or not to enter into a partnership.

Before the CBA can be made, the choice for a potential partner must be made. Before this choice can be made a brief outline will e given on the factors which have greatest potential influence for creating a successful partnership. This can be seen as the conditions to which a collaboration will have to comply as much as possible. According to De Witte (2007), these five criteria are important:

- Experience on alliances and previous partnership: experience gives a greater chance of success
- Choice of partner: a partner that has been worked with, and a partner that is complementary with regard to assets, technology and knowledge will have a positive impact on cooperation.
- Sharing of the benefits: revenue should be proportionate with regard to marketing advantages, revenue generation, cost reduction, synergy creation and reduction in competition.
- Depth of cooperation: the more activities that are integrated, the higher the productivity gains are that can be achieved.
- Creation of exit barriers: when investments have been made it is unlikely that the alliance will be left.

These factors should thus be found or created.

In addition, De Witte also determined which factors have a negative impact on a partnership.

- Not a good match of strategies and / or corporate cultures.
- Expectations of partners can not be met due to operational problems.
- Lack of trust.
- Cultural differences; national alliances have a greater chance of being successful than international partnerships.
- Legal issues.

These latter factors will therefore have to be avoided.

This paper will be set up as follows. First, the methods of the study will be discussed in Chapter 2. Subsequently, Chapter 3 delivers a model for small companies in the personal aviation segment to make a first global estimate of the financial implications for the company, before entering a partnership with another airline. This research will end with conclusions and some final remarks.

2 Research method

The purpose of this study aims at small airlines that are in the segment of private aviation to reduce the uncertainties in the expectations of the financial results of entering into a partnership with another airline in aviation. A step by step plan has been designed to run the cost-benefit analysis. This chapter will explain how this has been established.

For conducting the cost-benefit analysis the Evaluation of Infrastructure projects, Guidelines for Cost-Benefits Analysis (OEEI) (Eijgenraam, 2000) will be used as a guideline. This guidance is based on nine research steps by which a Social Cost Benefit Analysis (SCBA) can be made. This is a proven method developed in 2000 by order of the Ministry of Transport. The reason that this guidance has been chosen is because it is a clear and commonly used method for creating a cost-benefit analysis, also at a social level. This last aspect of the OEEI is less important for an airline, which operates in the present circumstances of extremely high competition, as Hof (2001) and Domanico (2007) confirm. This is mainly interested in the influence of a possible partnership at a corporate level, where main focus is on the money that can be earned. Therefore the social effects of the SCBA have been omitted. With the OEEI as the guideline the model is subsequently developed specified for the individual airline, with which this company can determine the possibilities for a partnership.

3 Cost benefit analysis model

In this chapter a model will be explained, which can show airlines within the field of personal aviation what partnership with another party within aviation could make in terms of financial income. This initiating party will be able to execute the model based on its own characteristics and expectations. The cost-benefit analysis will lead to a bandwidth for economic growth and stagnation of growth scenario's of cooperation, in which the proceeds will fall. Knowledge of financial expectations and the risks can then help the company in making a decision on the partnership.

The basis of the model, as described in Chapter 2, is the OEEI guideline. For this steps used within this study, each paragraph describes what a basic solution could be for the user of the model. This can then further be specified by the user himself.

To come to the final cost-benefit analysis, the problem situation and the environment will first have to be carefully analyzed. This will be done in step I to VI. In the final steps a quantified cost-benefit analysis will be made.

3.I Problem Analyses

Entering into a partnership offers opportunities in generating customers, cost reduction and knowledge. However, it is very difficult to specify the influences of a partnership on these factors. Uncertainties in the future, short and long term, play an important part.

3.II Project Definitions

In the project definition first the most important elements that are functionally part of the project will be described. In the case of the realization of a partnership between two airlines, this mainly refers to the efforts made in the form of consultation and negotiations. These posts will come back to the start-up costs of the partnership.

Regarding the duration of the project a long term will be chosen. This is because substantial investments are made in the startup phase, within the foreseeable future; depending on the money and effort put in, these will be earned back. Moreover, such a partnership will also be a long term relationship. One can think of a period between ten and twenty years (SWOV, 2008).

3.II.1 Alternatives

This research will look at two alternatives for which the CBA will provide a possible outcome.

The first (zero) alternative has been formulated as follows:
The initiating party, a small company that specializes in personal air travel within Europe, will not join in an alliance with another airline. Customers and thus revenue, will have to be brought in by operating alone.

The project alternative consists of the following:
The initiating party will engage in a partnership as soon as possible with a for him interesting airline.

3.III Identification of project effects

The identification of project effects has been made in a previous analysis (De Boer, 2009) and the following effects became apparent when a partnership would be started: generation of more customers, more flights, more revenue and more knowledge. These effects could then lead to a greater need for staff.

This analysis shows that only direct and indirect effects affect the party initiating the partnership and so external effects can be omitted. This is a logical conclusion for a commercial company like an airliner, since they have no effect on their own revenue and expenses. In section 3.VII these effects will be quantified.

3.IV Estimates of relevant exogenous developments

Within this part of the CBA two scenarios will be described for the set timeframe. These scenarios, which consist of well-founded assumptions concerning the surroundings of the project, represent a growth and growth stagnation scenario in which the bandwidth of the CBA can be determined. First though it is needed to look at which criteria determine the outcome of a scenario. In this case for each scenario the expected growth in Gross Domestic Product (GDP) has been incorporated. This factor was chosen because the GDP, according to, among other Doganis (2005), for general aviation gives high correlation for the number of Revenue Passenger Kilometers expected (RPK). This measures the amount of passengers transported and the kilometers they fly. This is of course directly linked to the revenue that a company makes. For personal aviation, the GDP is also good indicator (Bombardier, 2009). Since RPK partly indicates how many customers are carried, this study assumes that the GDP and growth in customers interact in a relationship of 2 to 1.

The scenarios are also derived using data from the Central Office of Statistics (Lejour, 2003), which in 2003 created four scenarios for the long term development of Europe. The highest growth and growth stagnation scenarios for aviation will be used in this investigation and are described below.

3.IV.1 Growth Scenario

In the best case for the airline market Europe will evolve into the Global Economy scenario. According to the COS this will result in an average annual growth of 2.5% of the GNP in 2040, which will be the growth factor in the airline industry. Regarding personal air transport this growth is also confirmed by the research of Bombardier (2009). This business jet builder forecasts the demand for business jets for the following ten years. During this period Bombardier expects, in the scenario of a Global Economy, a strong recovery of the business jet market. It is considered that this corresponds with the demand for personal air travel in a lower luxury segment.

3.IV.2 Growth stagnation scenario

In a less positive scenario, the economy, and hence the GDP, will experience an average growth of 0.6 % per year, according to the Regional Communities scenario. According to the models this also applies to the demand for air travel; this scenario will result in a minimal growth in need.

It should be noted that these assumptions have been made based on the scenarios outlined by the COS in 2003. Because from 2007 the credit crisis has had a major impact on the global economy, it can be assumed that the probability that the outlined growth scenario will not occur and that the results based on the growth stagnation scenario are more likely.

3.V Estimation and valuation of project effects

The next step according to the OEEI is the estimation and valuation of project effects. This will be done by a market- and competition analysis. This is a pre calculation based on the demand for the delivered project services. These analysis will be implemented for the scenarios outlined above.

3.V.1 Market Analysis

The market analysis show the development of personal air transport within the relevant region, northwestern of Europe. According to the study of Bombardier (2009) the market for business jets will pick up in Europe in 2010 or 2011. The Ministry of Transport (2006) expects for Schiphol under the current policies till 2020 and 2040 in all scenarios an increase (from 1.5 to 6 percent per year) in passengers carried, which confirms the expectation in growth. The latter study has made the assumption that unexpected situations have no effect in 2020. For the current economic crisis, the credit crisis, this is a valid assumption. If such crises are more prevalent in the coming years then the likelihood that this scenario will actually occur, will diminish.

3.V.2 Competitive analysis

Following the market analysis is the analysis to determine the contribution a partnership with another aircraft carrier could make to additional demand for private flights for an individual airline.

A good method to determine the number of customers in a first stage of a study, is by comparing the alliance to be set up with similar to a more or less equivalent, already established partnerships. The results of this partnership could serve as a comparison to estimate the expectations of the new partnership.

In addition to estimations of the number of customers delivered by the alliance, also reactions from the competition need to be taken into consideration. It is expected that the reactions to a partnership will be minimal. This expectation is based on the one hand on the very small the number of companies offering cheap air travel within Europe; this limits the possibilities for another alliance. On the other hand, in 2005 a successful partnership (Flight International) started between Lufthansa - a traditional airliner - and NetJets - a business jet operator - but within the airline business there were no further responses in the sense that other alliances within private aviation were started.

3.VI Estimated investment- and exploitation costs

The initiation of an alliance has, besides its positive aspects - creating more traffic, reducing cost and provides knowledge - also negative aspects. The alliance will of course have to be set up, an investment costing money and time. The costs that play a role are firstly all the hours invested in setting up the partnership. Consultation will also be necessary with the alliance, which will remain an annual cost. It is assumed that both parties will equally contribute to these costs. By creating more flights and the maintenance of the partnership, an extra load of work will have to be carried by the current staff. Finally, depending on the mutual agreement for flights created by the partnership, margins can be calculated for the other cooperating party. This will be calculated directly into the fare, so that each flight will not make less profit. This is also an annual cost, which depends on the number of flights made. Whether these margins will be calculated, depends on the negotiating position of the traditional airline. The initiating company will initially serve the company with an additional service rather than directly generate revenues.

3.VII Manufacturing of cost-benefit summations

In phase one through to phase six, the entire analysis of the problem situation and its surroundings has been made. With the collected data, the design of the cost-benefit analysis be made. The CBA will be used for the two described scenarios, the growth and growth stagnation scenario. First, the expected revenues are to be determined, then the costs incurred will be discussed.

3.VII.1 Revenues

In this section the method used to determine the expected revenue is described. This will be done for both alternatives.

Zero alternative

The income that could be achieved in the zero alternative, can be derived from the existing business plan. It is assumed that the expected growth in customers and revenues is achieved.

Project Alternative

Newly attained customers are basis for the new partnerships revenue targets. These estimates are determined in phase V of the competition analysis using a corresponding partnership. This enables the revenue the initiating party can achieve, determined on the basis of the scenarios in discussed in 3.IV.
To come to the final annual earnings, a (smaller) calculation must be made with previous data, as in equation (i).

$$Flightincome_{year} \frac{(Customer/Year)*(Price/Flight)}{Customer/Flight} \qquad \text{(i)}$$

This equation contains three unknown values. That is the price per flight, the average number of customers per flight and the number of customers booking a flight. These factors are reflected in the knowledge gaps specified in de Boer (2009) and described in the introduction. In order to calculate the average price per flight, the average flight distance will have to be determined. These factors have a direct relationship with each other and will be done in section 3.VII.1.1, average flight distance. Depending on the company that uses the cost-benefit analysis, the price can be determined and entered into the model. To determine the number of customers using the service, section 3.VII.1.2 will look at the course of growth when a new product is introduced into the market.

The individual user can then apply this to its own company. Finally, the average number of passengers per flight has to be determined. This depends on the company using the CBA.

3.VII.1.1 Average flight distance

Up till now it is only determined how many customers an alliance can produce, but this does not directly answer the question how much money this will generate. Here for it needs to be determined what distance passengers will fly on average. It is assumed that flight distances in both scenarios are equal. For the flights of passengers three categories have been determined: first point-to-point flights can be booked. Besides, a connecting flight can be offered. This may be an intercontinental flight, with a hub as destination. Another option is that the customer first has an European flight, with a short connection near its final destination. These categories all have their individual characteristics and thus individual revenue production. For the first category, point-to-point flights, it is assumed that an average flight distance is 322 km. This is an average determined by Eurocontrol in 2007 for jet and turboprop flights within Europe. For passengers who switch to a connecting flight this distance will be shorter, as they first fly to a hub or other airport located close to their destination. After this they will fly with a smaller plane to their final destination. This is assuming that the first 100 km[1] to the airport will not be flown by plane, but will be done by other transportation means. We are here talking about the average distance from a hub and the surrounding small airports. To determine this distance, first the average distance between two hubs will be determined. The maximum distance is halfway between the hubs; the average distance is halfway between 100 km from the airport and the maximum flying distance (see Figure 1).

The average distance between two hubs is 320 kilometers (Majka, 2007). This means that the average distance to fly for a transfer from an intercontinental flight, is 130 km (see Figure 1). This is much lower than the previously determined average distance of 322 km for passenger air travel.

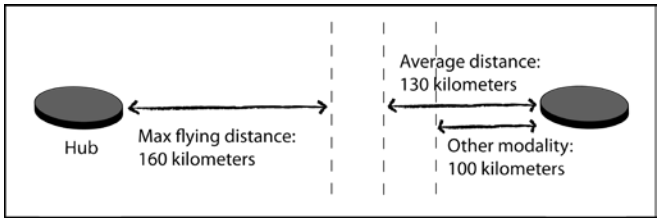


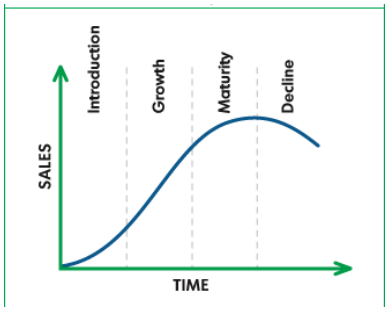
Figure 1, determination of average distance between hubs

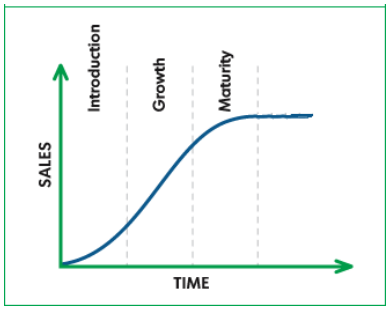
Finally it will have to be determined how far customers will fly when they make a connection from within Europe. The same method shall be used as in the previous calculation. According to Majka (2007) this shows that the average distance between medium-sized airports is 100km, with a maximum flight distance of 50 km. Looking at the predetermined value that customers rarely make a flight shorter than 100 km, this flight will never be booked.

All these proposed values can be used as a basis input for the model. However it is also possible to adjust these to settings which correspond to the users own data.

3.VII.1.2 Proceeding of growth cycle

When a new product is launched into the market, sales will take place on the basis of a growth cycle (Van Gent et al, 2004) (Figure 2). In the case of a partnership between the two airlines this growth cycle can also be used as a basic tool. As a main difference it should however be noted that in the latter case, services are offered rather than a product sold. Saturation of the market not an issue and will not necessarily result in a decline in sales, as illustrated in Fig. 3.





[1] Only 3,14% of business aviation flights is 100km or less according to Eurocontrol in 2007

Figure 2 and 3, expected growth cycle of a product and a service

The course for the future can be determined using this cycle of growth and the knowledge acquired in relation to customer growth from previous partnerships. As determined in Section 3.IV the expectation of the stagnation phase may be defined by a 2 to 1 relation in respect to the Gross Domestic Product forecast. The intermediate growth can be determined on the basis of the results of a similar partnership. If this information is incomplete, intermediate values can be determined by interpolation.

In summary, the following factors are important when determining the available revenue from the partnership and the user of the model can enter data based on the specific features the company. Specified values could be used.

- Average flight distance at a transfer
- Percent of customers that transits to a connecting flight
- Average fare with a transfer
- Margin of the flight handed over to the partner after a transfer
- Percentage of customers that book a point-to-point flight
- Average flight distance of a point-to-point flight
- Average fare of a point-to-point flight
- Margin of the flight as to the partner after a point-to-point transfer
- Number of flight days per year
- Average number of customers per year
- Number of customers per flight per day on t = 0
- Expected growth of customers as result of an alliance (growth cycle)

3.VII.1.3 Non-monetary benefits

In every project there are advantages and disadvantages which can not be expressed in Euros. Nevertheless, these have to be included within the cost-benefit analysis to show the full picture. This is usually done by entering these as Pro Memoria (PM) posts in the CBA. Within this project this will involve the knowledge that can be exchanged between partners, with which subsequently management perform better, making both parties more successful. So knowledge can be noted as positive PM post on the CBA.

In the appendix the sheet can be found in which all the factors have to be entered to result in the total earnings.

3.VII.2 Expenditure

This paragraph will describe a method that estimates costs that are important when a company is operational and flying (within the zero alternative) and when it is entering an alliance (the project alternative).

Zero option

As also described in the revenue, the costs that are expected to be made can be copied from the existing business plan of the company initiating the partnership. Often this information is only available for a few years because of the difficulty surrounding longer-term estimates. Because these figures are important to this study, they will have to be estimated anyway. This can be done by applying the known values to the growth cycle, as determined in 3.VII.1.2, and for the last years calculate the growth in costs parallel to double GDP.

Project Alternative

Next to the costs of an alliance, the major costs are the normal operational costs which also must be issued within the zero alternative. Therefore, these costs within the alternatives can be used as a basis and the costs of the partnership added on. Furthermore to determine the costs of establishing an alliance, both scenarios will have to be examined to determine the investment of establishing such a partnership. It is based on the following assumptions. Within the growth stagnation scenario is firstly assumed that, as the economy fails to grow, entrepreneurs and businesses will not be eager to enter an alliance due to the necessary risks involved. Therefore, most investments must be made to achieve a good result. Within the growth scenario there is public optimism regarding the future and will therefore more risks are expected to be taken. The investment of time and money in this alternative will be low, as setting up an alliance will run smoothly.

Then the various costs can be looked at which come to the foreground when setting up a partnership. Determination of these financial posts and measuring them in financial expenditure was made based on an interview with two experts in the entrepreneurial and aviation business[2]. This interview concludes that seven

[2] Being two of the co-authors, S.S.A. Ghijs Msc and founder of Fly Aeolus, and M. De Haan MBA, management consultant and entrepreneur within the aviation industry

main factors must be determined to give a global estimate whether a partnership should be established and maintained. These factors will be described below with an indication of the investment of time and money.

Firstly the time invested in the setting up of an alliance will be significant, searching for partners and conducting consultation and negotiations. According to the experts this will take an average of about six months before everything has been achieved. In the best case scenario, as is expected in the growth scenario, a minimal investment will have to be made of three full time working weeks. In a less favorable scenario this could take up to 15 weeks. If there are no possibilities for a partnership at that time, then the conclusion can be drawn that the market has no interest.

In addition within the company, once the negotiations are finished, a person will have to be appointed who will manage the partnership. This will become part of an existing position which will be given this additional mandate. The time these efforts cost are worth at least two full time working weeks per year and a maximum of 12 weeks if the cooperation is very complex.

The costs related to the above, are dependent on the person and his function (salary) used within the initiating company. A standard salary of 2500 € per month could be assumed when no information is available.

Beside the time invested in the initiation of a partnership, some important fixed costs play a role. Firstly this involves a one-time cost of hiring a solicitor to formally put down any agreements made between the parties in writing. This cost can assumed to be approximately € 1000. The alliance will also have to be registered at the Chamber of Commerce for an amount of € 200. An accountant will have to be hired to keep track of the partnership. This will result in an annual fee of € 1000. Finally, the alliance will have to be promoted to reach the consumer. A cost of approximately ten percent (plus or minus two percent) of turnover generated by the partnership can be taken into account.

Finally by forming an alliance, as described in this report, additional customers will be attracted. These extra customers will provide extra flights, which will incur additional costs. The number of flights it produces has already been determined in the previous step of the process. This flight numbers can be used to determine the cost. This will depend on the company using this model.

In short, the posts which determine the costs of an alliance are the following:

One-time investment

▪ Notary costs	€ 1000
▪ Entry Chamber of Commerce	€ 200
▪ Negotiating hours in growth scenario	120 hours
▪ Negotiating hours in stagnation scenario	600 hours

Annual costs

▪ Management hours in growth scenario	80 hours
▪ Management hours in stagnation scenario	480 hours
▪ Accountant costs	€ 1000
▪ Marketing costs	10% of partnership revenue
▪ Flight costs through collaboration	depending on company

Other annual expenses

▪ Salary cost	€2500 per month / depending on company

3.VII.3 Net Present Value

To be able to give a better forecast of revenues and costs over the longer term, they will be discounted. This will be done on the basis of expected risks. This calculation will be done for the zero alternative and for both scenarios, growth and stagnation, within the project alternative. With this information the Net Present Value (NPV) can be calculated. When the result of this calculation is positive, it means that the investment for the project is expected to be recovered; when the results turn out negative, the expectancy is that the project will make losses. In order to determine the NPV, paragraph 3.VIII.3.1 will first value of the discount rate. In the succeeding step, the NPV will be calculated.

3.VII.3.1 Discount rate

The value of the discount rate (r) will differ for the two different alternatives and will therefore be determined separately.

Zero alternative
The only risk which is important within the zero alternative is the risk free rate. This is the interest rate, which would be obtained if the money would be punt on the bank as an investment. Currently this is a generally set value at 2.5 percent (Aalbers et al (2009), Forest (2007)).

Project alternative
According to Aalbers (2009), for a Social Cost Benefit Analysis, where there are no good indications for the risks involved, a discount rate of 2.5 percent risk-free rate can be assumed with 3 percent on top concerning other risks. However this project does not perform a Social CBA, as described in Chapter 1. But since - in part - the manual for a SCBA is used, and the discount rate seems to have a realistic value, for this study also this value is adopted . The risks that the three percent include are:

- Market risk: Cooperation is less successful than expected and fewer customers than expected will result from the cooperation
- Investment risk: The investment appears to be higher than expected

Within the growth scenario however it is expected that the risk will be lower than for the stagnation scenario. This is because more capital will be present on both sides of this cooperation which causes a lower risk of the investment. To express this within the discount rate, the growth scenario will be rounded down to a rate of 5 percent and the stagnation scenario will have a discount rate of 6 percent.

3.VII.3.2 Execution of the Net Present Value
Now the revenues, costs and the discount rates for both alternatives and scenarios are known, the final step of the CBA can be carried out: the determination of the Net Present Value.

For this method for each year the cash flows will be determined. These will then be corrected with the discount rate, which will result in an expected gain or loss for that specific year. The total sum of these values gives an indication whether the project will make profit or losses on the long-term, indicated by a positive or negative value of the NPV.

3.VIII Validation and risk analysis
Finally to determine whether the estimates of revenues and costs result in realistic values, multiple possibilities to test this are available. A first option is that one can look at similar collaborations, where the results of this cooperation and its cost-benefit analysis can be compared. When the results have the same order of magnitude, it can be assumed that the results give reasonable estimates and can support the decision making. A second method on testing the results of the cost-benefit analysis, is to interview experts who can give their opinion on the model and its result, on whether they think it has realistic outcomes.

When this analysis gives a negative result, the CBA could either be improved or it has to be decided that the results do not play any role within the decision making, due to unreliable values.

This chapter described how a cost-benefit analysis could look like when an airline wants to start up a cooperation. The model is furthermore being used by the initiating party of this research, Fly Aeolus, and the first results are coming in. When one is interested in these results, the author can be contacted for further information.

4 Conclusion

In short, this research has been done for small airlines within the private aviation sector, which want to consider the possibilities on starting an alliance. With the described model uncertainties regarding the revenues and expenses can be reduced. This provides support for the decision making. This report has attempted to answer the following question:

> *How does a model for an airline look in the personal segment looking for an alliance where an estimate can be given of the financial impact on this company for a growth- and growth stagnation scenario?*

After conducting the research, it can now be concluded that such a model consists of the following aspects:

Revenues

- Average flight distance at a transfer flight
- Percentage of customers which switches from a transfer flight
- Average fare for a transfer flight

- Percentage of margin on a transfer flight from a partner
- Percentage of customers that takes a point-to-point flight
- Average flight distance of a point-to-point flight
- Average fare for a point-to-point flight
- Percentage of margin on a point-to-point flight from a partner
- Number of working days per year
- Average number of customers per flight
- Number of customers per day at t = 0
- Expected growth of customers due to a cooperation (growth cycle)

Costs

Investment costs

- Notary fees
- Chamber of Commerce subscription costs
- Negotiating hours within growth scenario
- Negotiating hours within growth stagnation scenario

Annual costs

- Management hours within growth scenario
- Management hours within growth stagnation scenario
- Audit fees
- Cost of marketing
- Flight costs due to alliance

Other costs

- Wage costs

When these values will be entered within the model by the initiating party, for both the growth and stagnation growth scenario the expected costs and returns will be estimated. Besides, within an cooperation also an exchange of knowledge between both parties can be included as an additional benefit.

Appendix – Model input

This appendix shows the model and the input it needs. The empty cells are to be filled in by the user of the model, a company focused on business aviation. The grey values are standard input of the model, but can be adjusted by the wishes of the user.

Table 1: Data to insert into the model for the results on revenues

	Unit	Costs
Percent customers from a transfer	%	
Average distance transfer	km	130
Average flight price transfer	€	
Average flight time transfer	min	
Margin per flight for partner at transfer	%	
Percent of customers which flies point-to-point	%	
Average distance point-to-point flight	km	322
Average price point-to-point flight	€	
Average flight time point-to-point flight	min	
Margin per flight for partner at point-to-point flight	%	
Number of flying days per year	day/year	
Average customers per flight	customer/flight	

Table 2: Data to insert into the model for the results on costs

One time investment	Unit	Costs
Notary fees	€	1000
Chamber of Commerce subscription costs	€	200
Negotiating hours within growth scenario	hour	120
Negotiating costs within growth scenario	€	2931
Negotiating hours within stagnation scenario	hour	600
Negotiating costs within stagnation scenario	€	14655
Annually investments		
Management hours within growth scenario	hour/year	80
Management costs within growth scenario	€/year	1954
Management hours within stagnation scenario	hour/year	480
Management costs within stagnation scenario	€/year	11724
Accountancy costs	€/year	1000
Marketing investments	% of revenue	0,1
Marketing costs	€/year	changes annually
Flight hours due to cooperation	hour/year	changes annually
Flight costs due to cooperation	€/year	changes annually
Flight costs per hour	€/hour	
Other		
Monthly salary	€/month	2500
Ratio on salary - wages	-	1,7
Wages per month	€/month	4250
Wages per hour	€/hour	24

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