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COST AND REVENUE SYNERGIES IN AIRLINE MERGERS – EXAMINING GEOGRAPHICAL DIFFERENCES

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Deregulation, privatization and shifting demand patterns in the airline industry, combined with the emergence of low-cost airlines and rising fuel prices have increased the competitive pressure on legacy airlines. Since alliances do not deliver sufficient benefits to counterbalance these trends, many airlines have engaged in mergers to seek for additional cost and revenue synergies. An extent body of literature investigates the synergy potential in mergers and alliances, but there is no study on how synergies differ among mergers and what potential influence factors cause these differences. This paper aims at explaining differences in synergy estimates and realized synergies in recent airline mergers and places a special focus on geographical influence factors.

The research methodology uses a comparative case study comprising six large airline mergers between 2003 and 2012 from Europe, North America and Latin America. After analyzing the cases individually, the pre-merger situation of the merging airlines, the synergy estimates and the realized synergies of the cases were compared.

The results show considerable geographical differences in pre-merger cost structures, synergy estimates, and synergy realization. The European mergers present lower synergy estimates but also lower integration costs than mergers in the Americas. Whereas European airlines estimate cost synergies higher than revenue synergies, both North and Latin American airlines expect more revenue synergies than cost synergies from airline mergers. Only one merger showed superior post-merger profitability which indicates that the achieved synergies in the broad majority of the cases are insignificant.

KEYWORDS: Airline merger, mergers & acquisitions, synergies, cost synergies, revenue synergies

CLASSIFICATION: Merger and Alliance in Air Transport; Airline Strategy, Management and Operations; Aviation Case Study

1 Introduction

In the past 15 years, the global airline industry has undergone major changes. Deregulation, privatization and shifting demand patterns led to a significant change in the business environment (Sterzenbach, Conrady, & Fichert, 2013). The price pressure increased due to emerging low-cost carriers and rising fuel prices. As a result, many airlines faced declining profitability and had to rethink their business models as independent full-service carriers (Iatrou & Oretti, 2007). Synergies became a major issue in order to respond to the increasing price pressure. In the beginning, most airlines strived for airline alliances to create cost and revenue synergies that led to the formation of big airline alliances, such as Star Alliance, oneworld and SkyTeam. In 2010, these three alliances accounted for a total share of 68% of total revenue passenger-kilometers (RPKs) flown, with an increasing tendency (IATA, 2011).

However, alliance synergies seem to be insufficient to maintain competitiveness as the increased mergers & acquisitions (M&A) activity among airlines in the past 10 years signals. The most recent M&A wave started in 2001 with the TWA takeover by American Airlines. This transaction set off a domestic consolidation wave in the United States (US) and paved the way for subsequent further large mergers. With the most recently announced merger between American Airlines and US Airways, only three large legacy carriers dominate the market in the United States, namely American Airlines, Delta Airlines and United Airlines. In Europe, a similar consolidation wave formed three large legacy airlines: Air France-KLM, the International Airlines Group (IAG), and the Lufthansa Group. The cross-border airline merger phenomenon has even arrived in emerging markets like Latin America, producing the LATAM Group and the AviancaTACA Group.

Most literature compares cost and revenue synergies in airline alliances to synergies emerging from M&A in order to explain the current M&A wave (e.g. Doganis, 2010; Iatrou & Oretti, 2007; Kleymann & Seristö, 2004). However, there are no studies on how cost and revenue synergies differ among airline mergers and what potential influence factors could explain these differences. Furthermore, the actual achievement of synergies in airline mergers has not yet been analyzed in scholarly literature.

This paper aims at explicating differences in airline merger synergy estimates and realized synergies in recent airline mergers. Special focus is placed on three influence factors, namely the geographic origin of the merging airlines, the maturity of their home market and whether the merger is a domestic merger or a cross-border merger. This aim is concisely addressed in two guiding research questions:

RQ-1: How do cost and synergy estimates differ between different mergers?

RQ-2: How have the estimated synergies been realized? Which estimated synergies were realized and which synergies could not be realized?

The second chapter presents the literature review followed by chapter 3 research explaining the approach. Chapter 4 presents the case study results which are discussed and interpreted in chapter 5 and concluded upon in chapter 6.

2 Synergies in airline mergers

The existence of cost synergies (Appendix 1) in airline cooperations has been widely acknowledged in the literature (Evripidou, 2012; Götsch & Albers, 2005; Hansson, Neilson, & Belin, 2001; Merkert & Morrell, 2012; Rajasekar & Fouts, 2009). However, the classification of potential cost synergies varies widely between scholars. Table 1 summarizes the main cost synergy sources and the respective levers.

Most cost synergies arise because of redundancies of processes, resources or assets as consequence of the cooperation. Eliminating these redundancies is a major driver for efficiency enhancements in both mergers and acquisitions. A second common lever is joint procurement of fuel, materials and IT systems. Thanks to a greater bargaining power, companies can benefit from lower fees, sales commissions and financing costs (e.g., for aircraft leases). Furthermore, fleet standardization can positively impact maintenance and training costs, and network and flight schedule optimization can result in better aircraft utilization, creating economies of density and lowering the variable operating costs.

Table 1: Cost synergy classification for airlines

Cost synergy	Cost lever	Source
Labor costs	• Elimination of redundancies	(Evripidou, 2012; Merkert & Morrell, 2012)
Network optimization	• Elimination or reduction of inefficient hubs and routes • Higher aircraft utilization	(Caves, Christensen, & Tretheway, 1984; Evripidou, 2012; Hansson et al., 2001; Merkert & Morrell, 2012)
Fuel & Materials	• Reducing redundant capacity • Higher bargaining power through joint procurement	(Evripidou, 2012; Götsch & Albers, 2005; Hansson et al., 2001; Merkert & Morrell, 2012)
Maintenance & Training	• Fleet standardization	(Hansson et al., 2001; Merkert & Morrell, 2012)
Infrastructure	• Joint infrastructure • Reduction of redundant infrastructure	(Götsch & Albers, 2005; Hansson et al., 2001)
Fees (Landing, ground handling, overflight)	• Bargaining power	(Hansson et al., 2001)
Sales and Marketing	• Elimination of duplicate sales functions • Rationalization of corporate volume agreements and commissions	(Hansson et al., 2001; Merkert & Morrell, 2012; Rajasekar & Fouts, 2009)
IT systems	• Development of joint IT systems	(Merkert & Morrell, 2012)
Lower financing & capital costs	• Increase of credit rating • Lower leasing fees	(Götsch & Albers, 2005)

Similar to cost synergies, revenue synergies are also widely accepted as profitability drivers in airline cooperations (Fritz, 2005; Götsch & Albers, 2005; Hansson et al., 2001; Merkert & Morrell, 2012; Rajasekar & Fouts, 2009). The nature of revenue synergies lies in creating super-additive value with an unchanged set of production factors. However, the combination of production factors allows for an increase in price or passenger volume.

Table 2: Revenue synergy classification for airlines

Revenue synergy	Revenue lever	Source
Access to new markets (slots, traffic rights)	• More flights possible • Less regulatory restrictions	(Götsch & Albers, 2005; Hansson et al., 2001; Merkert & Morrell, 2012; Rajasekar & Fouts, 2009)
Larger network	• Higher customer attractiveness	(Fritz, 2005; Götsch & Albers, 2005; Hansson et al., 2001; Rajasekar & Fouts, 2009)
Combination of frequent flyer programs	• Higher customer attractiveness	(Götsch & Albers, 2005; Hansson et al., 2001; Rajasekar & Fouts, 2009)
Harmonized pricing	• Higher margins	(Fritz, 2005; Götsch & Albers, 2005; Merkert & Morrell, 2012)
Increased market power	• Higher margins	(Götsch & Albers, 2005; Merkert & Morrell, 2012)
Joint market analysis	• Better fulfillment of customer needs	(Götsch & Albers, 2005)

Synergies can be achieved in all forms of cooperations between airlines. However, the amount of synergies as well as the type of achievable synergies seems to be related to the level of integration. In other words, airlines can realize a different amount of synergies in alliances than in mergers. This fact is confirmed by various scholars (e.g. Gudmundsson & Lechner, 2006; Iatrou & Alamdari, 2005; Iatrou & Oretti, 2007; Merkert & Morrell, 2012). Nevertheless, the precise differences remain unclear.

Most scholars assume that airline mergers (Appendix 1) allow for more overall synergies than airline alliances. Flores (1998) classifies alliances as “soft solution” to capture synergies without risking the merger risks whereas Iatrou & Alamdari (2005) see alliances as the only viable option for realizing synergies when stringent regulatory frameworks are in place. In the same spirit, Fritz (2005) sees alliances as a door-opener for M&A transactions since ongoing cooperation lowers the transaction costs of merging and improves the quality of due-diligence because of joint experience and some joint operations.

This claim is nevertheless disputed in literature. For instance, Gudmundsson & Lechner (2011) argue that merger benefits are only larger when the merger partners have not been engaged in the same alliance before. In a previous theoretical study (2006), these authors also claim that alliances generate primarily revenue synergies while M&A also create cost synergies. This claim is supported empirically by several studies of Iatrou & Oretti who used executive surveys to learn

about the performance implication of airlines alliances. In an empirical study of 2005, top executives acknowledged witnessing revenue increases and cost reductions (80% of respondents claimed so) as consequence of joining an alliance. However, most executives did not value the cost reductions as significant as the revenue increases and the impact of alliances was deemed higher for developing countries compared to developed countries. In a follow-up study, Iatrou & Oretti (2007) find that executives expect alliances to deliver more synergies than mergers only in the "market growth" factor. In the categories "Economies of scope" and "Efficient use of hubs", there are no significant differences between mergers and alliances. In all other categories, including economies of scale, procurement, network optimization and lower financing costs, the positive effects of mergers are significantly higher than the positive effects of alliances. However, the risk of negative synergies is also estimated to be much higher in mergers than in alliances. Merkert & Morrell (2012) confirm the perception of airline executives as they find evidence suggesting that if M&A partners were part of the same alliance, most synergies are cost-synergies as most revenue-synergies have already been captured through the common strategic alliance.

In conclusion, mergers seem to allow for higher positive synergies than alliances. Revenue synergies can be realized in both mergers and alliances whereas cost synergies are easier to capture in mergers. The merger synergy potential is hence lower for airlines which are already engaged in the same alliance before.

3 Research approach

Due to the novelty of the cross-border merger phenomenon in the airline industry, only few examples of this kind of merger exist so far. The small sample complicates a purely empirical research method and calls for alternative approaches. The comparative case study methodology developed by Eisenhardt (1989) and refined by Yin (2013) offers an attractive alternative that combines qualitative research with empirical elements. Eisenhardt (1989) recommends using it especially for "early stages of research on a topic" which definitively applies to cross-border airline mergers. The case method has already been used by various air transport scholars (e.g., Graf, 2005; Lawton, Rajwani, & O'Kane, 2011) and is thus well-established in the field of aviation. Hence, this paper follows a mainly qualitative research design inspired by the comparative case study method.

3.1 Literature review

First, a literature review is conducted following a structured keyword-based approach which was developed by Webster & Watson (2002) and adapted by Vom Brocke et al. (2009). The

methodology comprises two main processes, literature search and literature evaluation, which are conducted in parallel and iteratively.

The first process step starts with the identification of relevant journals and databases for the literature search, while the second process step includes the selection of appropriate keywords and the execution of the keyword search (Vom Brocke et al., 2009). Table 3 displays the search results for all applicable keyword combinations. The keyword search was limited to abstract, title, and keywords and to peer-reviewed scholarly journals on all meta-databases as recommended in Vom Brocke et al. (2009). The number in brackets indicates the number of useful articles after the first literature evaluation, already cleaned from double entries. In total, 909 unique search hits were recorded for the different combinations of context filter and topic filters. Based on this, 55 articles have been deemed useful for the further literature analysis of this paper. It is noticeable that there is an extensive body of literature on airline mergers and acquisitions as well as on airline alliances, but only very little literature dedicated to synergies in the airline sector.

Table 3: Key word search results

	"aviation" OR "air transport" OR "airline"				
AND	**/**	**"merger" OR "acquisition"**	**"alliance"**	**"synergies"**	Total
EBSCOhost	7,193	185 **(16)**	163 **(11)**	12 **(1)**	360 **(28)**
ProQuest	8,641	159 **(3)**	164 **(10)**	17 **(0)**	340 **(13)**
Science Direct	4,623	74 **(5)**	129 **(9)**	6 **(0)**	209 **(14)**
Total	20,457	418 **(24)**	456 **(30)**	35 **(1)**	909 **(55)**

The third step of the literature review approach is the forward/backward search. The resulting 55 articles were used as the base for the forward and backward search. In the end, the usable body of literature contains almost 80 scholarly journal articles and books. The most frequently represented research fields are Strategic Management, Industrial Organization and Transport Economics.

The papers resulting from the literature review form the literature base for the theoretical foundation (chapter 3) which provides definitions on cost and revenue synergies in the airline industry as well as a distinction of mergers, acquisitions, and alliances.

3.2 Case study methodology

The second research step, necessary to both structure the case selection and to avoid over- or under-representation, starts with defining case selection criteria (Eisenhardt, 1989). The guiding criteria for the case selection in this paper are geography, market maturity and the international scope of the merger (cross-border merger). Merkert & Morrell (2012) identified 33 airline mergers and acquisitions between 1997 and 2012. If mergers and acquisitions of low cost carriers and regional feeder airlines in the US are excluded, 16 mergers remain. Six cases were selected from the list of potential case studies based on accessibility of information and recency. All influence factor values are matched in at least two cases each (see Table 2).

Table 4: Legacy airline mergers and acquisitions from 1999-2012

First airline	Second airline	Influence factors			Year
		Region	Market maturity	Cross-border merger	
Delta Airlines	Northwest Airlines	North America	high	no	2009
United Airlines	Continental Airlines	North America	high	no	2010
Air France	KLM	Europe	high	yes	2004
British Airways	Iberia	Europe	high	yes	2011
Avianca	TACA	Latin America	low	yes	2009
LAN	TAM	Latin America	low	yes	2012

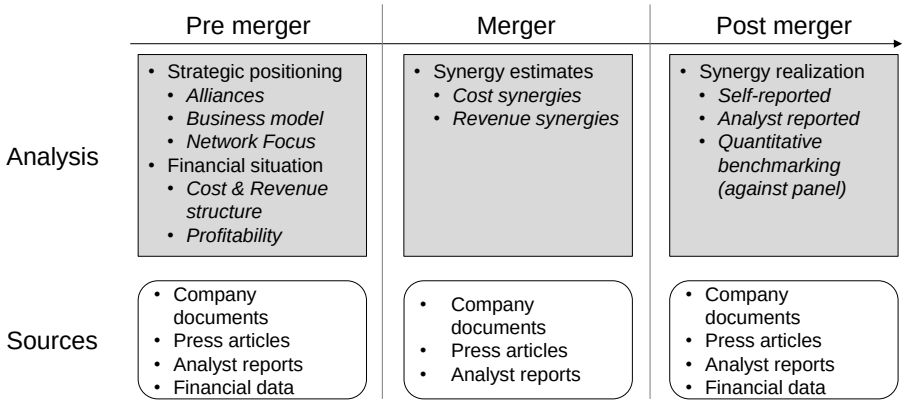
Source: adapted from Merkert & Morrell (2012)

Data collection relies on multiple data sources: company issued data from annual reports, presentations and press releases; data on expected and realized synergies gathered from third party sources such as press articles and analyst reports; existing case studies on the airlines of interest (especially on Air France/KLM, e.g., Del Canho & Engelfriet, 2008); and, data on cost and revenue development of the merged airlines is used to evaluate synergy realizations in a panel benchmark analysis. This data collection strategy is suitable for a comparative case study for multiple reasons. First, it allows for a triangulation of information to ensure an objective case

evaluation. Second, the combination of qualitative sources and quantitative sources enables an effective bi-dimensional analysis. Finally, all data sources are publicly available and allow for an efficient data collection process.

As proposed by Eisenhardt (1989), the analysis follows a sequential approach along three predefined dimensions: pre-merger indicators, synergy estimates and realized synergies. As competitive benchmark for cost and revenue comparisons and profitability analysis, a panel including 25 of the largest airlines has been established (see Appendix 2).

Figure 1: Data collection and analysis framework



4 Case study results

This chapter compares the six case studies according to the case analysis framework introduced in chapter 3. Using the insights of the case comparison, the research questions are then answered in chapter 5.

4.1 Pre-merger situation

In analyzing geographical differences in airline mergers, it is important not to focus only on mere synergy estimates and realization but also to investigate the different pre-merger conditions.

Table 5 shows that only in two cases (IAG and Delta/Northwest), airlines were member of the same alliance before merging. This suggests that Fritz's (2005) claim of alliances, as a "first step" towards a merger does not hold universally. Furthermore, if the proposition of airlines extracting revenue synergies mainly from alliances and cost synergies mainly from M&A, were right (Merkert & Morrell, 2012), then the IAG and Delta/Northwest mergers should have generated predominantly cost reductions, as the revenue synergies should have been extracted already in the

alliance. However, only IAG expected more cost than revenue synergies while Delta anticipated more revenue than cost synergies.

In Europe and North America, airlines have comparable business models and geographical focuses before merging. Only the airlines in the two Latin American cases differ in one or both aspects. LAN and TAM provide a good example. LAN followed a multi-market strategy with regional hubs whereas TAM operated mainly the Brazilian market with a traditional hub-and-spoke business model. Hence, LAN generated more than half of its revenues with international flights whereas TAM relied heavily on the domestic market. Interestingly, the mergers in Europe are more unequal in pre-merger airline capacity: British Airways had more than twice the capacity than Iberia and Air France was much larger than KLM at the time of merger. Airline mergers in the Americas have been more "mergers of equals" with capacity differences reaching from 22% (Avianca-TACA) to 69% in the case of LATAM.

The differences in unit costs prior to the merger vary significantly across geographies. North American merger candidates reported almost similar unit costs with a maximum difference of 3% for Delta and Northwest. Participating airlines in European mergers had much larger differences in unit costs: 12.6% between Iberia and British Airways and 7.7% between KLM and Air France. In Latin America, there is no clear pattern; LAN and TAM reported very similar unit costs whereas Avianca's unit costs were 50% higher than TACA's unit costs. Furthermore, Latin American merger candidates showed very different unit cost situations compared to the regional benchmark. Avianca, for example, reported the highest unit costs of all regional competitors whereas TACA ranked among the airlines with the lowest unit costs. In Europe and North America, all merger candidates featured either both higher or both lower unit costs than their competitors.

The analysis of the airlines' profitability at the time of merger reveals that both IAG and Air France-KLM merged when their operating margin was inferior compared to the benchmark airlines. In contrast, North American airlines seem to merge in periods of superior operating margins. This might be explained by the recent restructuring efforts of North American carriers prior to the mergers. Delta, United and Northwest all merged within few years after leaving Chapter 11, which allowed them to cut costs and regain competitiveness. European airlines, on the other hand, seem to merge in order to avoid upcoming bankruptcy, probably because the bankruptcy procedure in Europe focuses more on liquidation than on restructuring (Jarach, 2004). In Latin America, there is no clear pattern of airlines merging when they are in particularly competitive or uncompetitive shape.

Table 5: Pre-merger differences in strategic and financial indicators

		Air France-KLM	IAG	Delta/ Northwest	United/ Continental	LATAM	Avianca-TACA
Strategic focus	**Privatized before merger**	partly	yes	yes	yes	yes	yes
	Alliance	SkyTeam and KLM/Northwest joint venture	both oneworld	both SkyTeam	Star Alliance/ SkyTeam	Star Alliance/ oneworld	both none
	Business model	both hub-and-spoke	both hub-and-spoke	both hub-and-spoke	both hub-and-spoke	multi-market and hub-and-spoke	multi-market[1]
	ASK ratio[2]	1 : 1.75	1 : 2.27	1 : 1.63	1 : 1.28	1 : 1.69	1 : 1.22
	Domestic/ international focus	both international	both international	Both domestic	Both domestic	LAN: international; TAM: domestic	Avianca: domestic; TACA: international
Financial situation	**Unit cost difference**	7.66%	12.65%	2.84%	0.97%	5.8%	50.21%
	Unit costs vs. competitors	higher	lower	lower	lower	LAN higher, TAM average	Avianca higher, TACA lower
	Operating margin vs. competitors	lower	lower	higher	UA higher, CO average	both average	Avianca lower, TACA higher
	Differences in cost structure[3]	low	medium	medium	medium	low	high
	Largest unit cost item differences	• Staff costs (AF+) • Fees (AF+)	• Staff costs (IB+) • Fees (BA+)	• Charter (Delta+) • Fees (Delta+)	• Charter (United+) • Fees (United+)	• Selling (TAM+) • Passenger Services (LAN+)	• Fuel (AV+) • Fees (AV+)

Source: Own analysis based on case studies

[1] Multi-market strategy describes operating model in multiple domestic markets with one hub per market and mainly domestic services

[2] Compares the capacity multiple (in terms of ASK) of both airlines prior the merger

4.2 Synergy Estimates

Table 6 presents the initial synergy estimates for all mergers as published in the respective merger announcement documentation. It is striking that the synergy estimates of Air France-KLM and IAG differ only marginally, likewise the synergy estimates of Delta/Northwest and United/Continental: not only the absolute magnitudes but also the relative percentages are almost identical. This provides strong evidence of the presence of geographical differences in synergy estimates.

Table 6: Comparison of initial synergy estimates

	Air France-KLM	IAG	Delta/ Northwest	United/ Continental	LATAM	Avianca-TACA
Estimated yearly synergies (million US$)	550	520	1100	1100	400	220
in % of revenues	2.5	2.7%	3.5%	3.8%	4.4%	8.2%
Thereof cost synergies	60%	63%	33%	23%	30%	NR
thereof revenue synergies	40%	37%	67%	77%	70%	NR
CS in % of total costs	1.5%	1.7%	1.2%	0.9%	1.4%	NR
RS in % of total revenues	1.0%	1.0%	2.4%	2.9%	3.1%	NR
Years for full synergy extraction	5	5	4	4	4	3
Planned non-recurring integration costs (million US$)	NR	350	1000	1000	500	NR

CS – Cost synergies RS – Revenue synergies *Source: Own calculations, data from company synergy estimates*

Interestingly, European mergers are expected to generate more cost synergies than revenue synergies whereas both North American and Latin American mergers show reverse proportions. Furthermore, synergy estimates outside of Europe are more optimistic. Whereas total estimated

[3] Based on number of unit cost items that show a difference of 20% or more

synergies in Europe equal 2.5-2.7% of combined revenues, estimates in the US reach up to 3.8% and in Latin America up to 8.2% of total revenues. Furthermore, European airlines plan with a longer implementation horizon of five years whereas airlines in the American continent predict 3 to 4 years to fully extract the merger synergies. Also, the latter estimate the accumulated integration costs to be approximately equal to the yearly structural synergies after full merger integration. In contrast, European airlines estimate integration costs much lower than the yearly structural long-term synergies.

4.3 Synergy realization

Using the analysis framework presented in chapter 3.1, this section compares the company-reported synergy achievements and then conducts a cross-case benchmark analysis.

Company reporting

Table 7 displays all available synergy realization reports of the six case studies. As shown, realized synergies are available for all the airlines included in the panel only for the year following the merger. After that period, airlines seem to lose the incentive of reporting synergy realization. Only Air France-KLM reports synergy realization over the full integration period of five years.

Table 7: Comparison of reported synergy realization of case companies

			Air France-KLM	IAG	Delta/ Northwest	United/ Continental	LATAM	Avianca-TACA
Initial estimate on total synergies			550	520	1100	1100	400	220
Realized synergies	in mn US$ **(%)**	**1 year**	157 (**29%**)	174 (**33%**)	700 (**64%**)	400 (**36%**)	72[4] (**18%**)	57 (**26%**)
		2 years	414 (**75%**)	407 (**74%**)	1500 (**136%**)	1000 (**91%**)	-	163 (**74%**)
		3 years	633 (**115%**)	-	-	-	-	-
		4 years	996 (**181%**)	-	-	-	-	-
		5 years	1114 (**202%**)	-	-	-	-	-
CS		**1 year**	-	40 (**12%**)	-	150(**60%**)	-	-
		2 years	-	135 (**42%**)	-	300 (**120%**)	-	-
RS		**1 year**	-	134 (**69%**)	-	250 (**29%**)	-	-
		2 years	-	272 (**139%**)	-	700 (**82%**)	-	-

CS – Cost synergies RS – revenue synergies *Source: Own calculations based on company reporting*

[4] In first 6 months after the merger

The mergers of IAG (2011) and LATAM (2012) are very recent which explains why for these companies, synergy achievements reports are only available for the first years after the merger. United/Continental (merged in 2010), Delta/Northwest (merged in 2008) and AviancaTACA (merged in 2010) all suspended reporting two years after the merger before completing the initially estimated integration period. Furthermore, the fact that only IAG and UnitedContinental report separately on achieved cost and revenue synergies complicates a holistic evaluation of company reporting.

Table 7 shows that in the first year after the merger, airlines realized between 26% and 64% of total estimated synergies. North American airlines seem to realize synergies faster than European and Latin American airlines. This assumption is confirmed in the second year after the merger when North American airlines realized between 91% and 136% of the initially estimated synergies while the airlines from other regions accomplished approximately 75% of the initial synergy estimate. Since most airlines expect the full extraction of synergies to happen over a 3-5 year integration period, it seems very likely that all case study airlines achieve their initial synergy estimate as long as the synergy realization continues more or less the same pace. Interestingly, IAG achieved more revenue than cost synergies in the first two years after the merger despite estimating cost synergies higher than revenue synergies. The inverse happened for UnitedContinental, so both airlines achieved their relatively lower synergy target faster than the relatively higher synergy target.

Since airline reporting is not only inconsistent but also incomplete, additional tools are needed to analyze and evaluate the synergy extraction in airline mergers. The financial benchmarking introduced in subsection 3.1 provides an appropriate tool for the cross-case analysis.

Revenue benchmark

Table 8 illustrates the relative unit revenue development of merged airlines compared to the regional benchmark in the first five years after the merger. As an example, if the regional benchmark[5] increased unit revenues in year one by 10% while the merged airline increased revenue only by 5%, the underperformance would be 5% and the relative performance would hence be -5 percentage points (pp). Displaying the results this way allows for a relative comparison across the mergers independent from time and absolute unit revenues.

[5] Regional benchmarks from airline panel, see Appendix 2

Table 8: Overview of relative changes in unit revenues compared to the respective benchmark

In percentage points (pp)

	Air France-KLM	IAG	Delta/ Northwest	United/ Continental	LATAM	Avianca TACA
Year 1	4.92 pp	7.85 pp	-3.43 pp	5.19 pp	-10.95 pp*	-13.88 pp
Year 2	2.57 pp	3.68 pp	-1.15 pp	1.52 pp	-	14.16 pp
Year 3	-6.81 pp	-	2.13 pp	-3.80 pp	-	9.36 pp
Year 4	-0.30 pp	-	2.95 pp	-	-	-
Year 5	6.31 pp	-	-	-	-	-
Total[6]	8.18 %	10.93 %	-0.01 %	2.23 %	-11.43 %	8.50 %

** only first 6 month after merger* *Source: Own calculations*

Except for IAG, no merged airline has been able to increase their unit revenues faster than their benchmark in every year of integration period. Air France-KLM, IAG and UnitedContinental increased the unit revenues faster than their peers in the first two years after the merger, before unit revenue growth fell short of the benchmark. Delta showed the inverse development with underperforming unit revenues in the first two years and an improving performance in the subsequent years. Latin American airlines suffered severe unit revenue cutbacks compared to the benchmark in the first year after the merger. AviancaTACA has been able to compensate this effect in the second and third year of the merger. It will be interesting to see whether LATAM shows a similar development in the next years.

If we compare the expected unit revenues (if unit revenues would have grown in line with benchmark average) with the realized unit revenues, the European airlines and AviancaTACA outperformed their peers significantly as actual unit revenues are 8-11% higher than expected unit revenues. Unit revenues of North American case airlines have grown with the average growth rate of its peers. The performance of LATAM cannot be evaluated terminally as only one year has passed since the merger was executed. The analysis implies presence of significant revenue synergies in European airline mergers. North American airline mergers show only little evidence for revenue synergies. Latin American airlines are difficult to evaluate as the exchange rate fluctuations disturb the revenue benchmark analysis.

[6] Relative difference between unit revenue projection with benchmark growth rate and realized unit revenues in last year of benchmarking

Cost benchmark

Table 9 illustrates the relative unit cost development of merged airlines compared to the regional benchmark in the first five years after the merger. Like the revenue benchmark, the cost benchmark uses percentage point deviations to ensure comparability across cases.

The development of unit costs relative to the benchmark follows the same initial pattern as the unit revenues. However, the extraordinary increase in unit costs is more pronounced than the extraordinary increase in unit revenues. Except for Delta and LATAM, all airlines experienced a significant increase in their unit costs compared to the benchmark. This phenomenon is most pronounced among European airlines which report actual unit costs of about 15% above expected unit costs. Delta Airlines and LATAM were able to limit the growth of unit costs more than the benchmark and report hence lower actual unit costs than expected unit costs.

Table 9: Overview of relative changes in unit costs compared to the respective benchmark
In percentage points (pp)

	Air France-KLM	IAG	Delta/ Northwest	United/ Continental	LATAM	Avianca TACA
Year 1	7.63 pp	4.02 pp	-3.39 pp	5.44 pp	-6.40 pp	-6.85 pp
Year 2	0.92 pp	13.51 pp	-3.76 pp	0.13 pp	-	12.84 pp
Year 3	-6.24 pp	-	2.88 pp	2.67 pp	-	4.15 pp
Year 4	0.25 pp	-	1.57 pp	-	-	-
Year 5	11.86 pp	-	-	-	-	-
Total[7]	14.62%	15.27%	-3.60%	7.40%	-6.19%	8.46%

Source: Own calculations

Table 10 summarizes the profit impact variables. If Air-France KLM would have incurred the same unit revenue growth as its benchmark, the absolute unit costs in 2008, five years after the merger, would have been ¢11.82 instead of the actual ¢12.88 which leaves a positive delta of ¢1.06. If we assume that Air France and KLM would have offered the same capacity without merging, the total revenues would have fallen $2764mn short of the actual revenues. The same applies to the unit costs. If Air-France unit costs and revenues would have grown with average benchmark growth rates, Air France-KLM would hence have saved $4940mn in costs; as a result,

[7] Relative difference between unit cost projection with benchmark growth rate and realized unit costs in last year of benchmarking

the operating profit would have been $2176mn higher than today. These assumptions are hypothetical but still serve to evaluate the relative profit performance of the merged airlines compared to the benchmark.

Table 10: Profit impact of post-merger cost and revenue performance

Δ Unit values in US cents, Δ Total values and profit impact in million US dollars

	Air France-KLM	IAG	Delta/ Northwest	United/ Continental	LATAM	Avianca TACA
Time span	5 years	2 years	4 years	3 years	1 year	3 years
Δ Unit revenue	1.06	1.19	-0.01	0.21	1.12	1.01
Δ Total revenues	2764	2607	-46	852	-1487	369
Δ Unit costs	1.89	1.69	-0.34	0.69	0.60	0.93
Δ Total costs	4940	3690	-1235	2758	-796	342
Profit impact	**-2176**	**-1083**	**1189**	**-1906**	**-691**	**27**

Source: Own calculations

Only Delta Airlines was able to increase profitability above average by saving significantly more costs than its peers and still achieving an average unit revenue increase. Both European airlines realized higher unit revenue growth than the benchmark but this was offset by an even higher increase in unit costs. UnitedContinental experienced the same phenomenon at a smaller scale while LATAM suffered a serious decline in unit revenues which was not balanced out by cost savings. AviancaTACA realized a small profitability increase making it the second case airline not to deteriorate profitability after the merger.

5 Discussion of results

Merger cost synergies are expected to make airlines more competitive in a globalized aviation market. Since the unit cost items differ widely across geographies, airlines with a relative cost disadvantage should be able to save more costs than cost competitive airlines (Fan, Vigeant-Langlois, Geissler, Bosler, & Wilmking, 2001). European airlines have both the highest unit costs and the highest unit revenues of all five panel regions. Since the panel airlines have to compete

on a global scale, it is unlikely that European carriers can raise unit revenues significantly to increase profitability. Thus, unit cost reduction seems to be the most viable strategy for European airlines (Nair, Fernández, & Ruiz, 2011) and should be reflected in the merger synergy estimates. North American and Latin American airlines have relatively low unit costs but suffer from low unit revenues, especially in North America. Hence, North American airlines are expected to search for unit revenue increases while maintaining their low cost base. Latin American airlines operate at much higher margins than their European and Latin American peers what makes it difficult to forecast whether airline mergers are expected to create more cost or revenue synergies.

The first research question addressed the issue of *"how cost and revenue synergy estimates differ between different geographies".* Table 11 presents the differences in merger synergy estimates for the three analyzed geographical regions.

Table 11: Regional comparison of merger synergy estimates[8]

	Europe	North America	Latin America
Total yearly synergies in % of revenues	2.6%	3.7%	6.3%
Thereof cost synergies	62%	28%	30%
Thereof revenue synergies	38%	72%	70%
Cost synergies in % of total costs	1.6%	1.1%	1.9%
Revenue synergies in % of total revenues	1.0%	2.6%	4.4%
Planned integration phase in years	5	4	3.5
Planned one-time integration costs as % of yearly structural synergies	67%	91%	125%

Source: Own analysis based on company synergy estimates

North and Latin American airline managers state much more ambitions synergy targets than their European peers. European airlines anticipate synergies of only 2.6% of combined revenues while North American airlines target 3.7% and Latin American airlines even 6.3%. Still, all case airlines estimate synergies below 10% of revenues which is considerably less than in other industries (Hosking, 2011). American airlines plan 3-4 years for the post-merger implementation process, and European airlines anticipate 5 years.

[8] Equally weighted average figures for each region

In accordance with the cost structure analysis, European airlines expect the mergers to set off primarily cost synergies while North and Latin American airlines estimate revenue synergies to be higher than cost synergies. Interestingly, North and Latin American airlines anticipate much higher integration costs (compared to the structural synergies) than their European counterparts. Furthermore, airlines in immature markets see more possibilities to generate substantial synergies than airlines in mature markets. The factor of internationality seems not to influence synergy estimates. International mergers in Europe are expected to generate smaller synergies than domestic mergers in the U.S. while international merger synergies in Latin America are estimated higher than domestic merger synergies in the US.

RQ-2 finally addresses the question on *"how the estimated synergies were realized"*. The realization was evaluated by a triangulation of sources, namely company reporting, analyst and press reports, and a financial benchmark analysis. The company reporting proved to be incomplete and inconsistent. Only Air France-KLM provided synergy achievement results for the whole integration period. Delta Airlines and AviancaTACA suspended reporting after two years while UnitedContinental, LATAM and IAG have not completed the post-merger integration yet.

All companies except for LATAM provided data on synergy achievements for the first two years after the merger. The cross-country mergers reported slower synergy achievement rates than the domestic mergers in the US. Despite being located in markets with very different conditions, airlines in Europe and in Latin America report almost identical progress in synergy realization, accomplishing 31% in the first year of the merger and 74-75% in the second year. North American airlines capture about half of the anticipated synergies in the first year and over-achieve the overall synergy target in the second year. European airlines are still likely to meet their synergy target on time as they planned with an integration phase of five years. Latin American airlines targeted more ambitious integration time horizons but at least AviancaTACA is likely to extract the full synergy potential after three years.

Table 12: Regional comparison of synergy realization in the first 2 years after the merger

	Europe	North America	Latin America
Realized synergies in year 1	31%	50%	31%
Realized synergies in year 2	75%	114%	74%[9]

Source: Own analysis based on company reporting

[9] AviancaTACA only

Since only IAG and UnitedContinental report separately on cost and revenue synergies, a geographical comparison becomes obsolete. However, IAG achieved – contrary to the previous synergy estimate – more revenue synergies than cost synergies in the first two years after the merger.

The financial benchmark with the airline panel provided an independent approach to evaluate post-merger performance in airline mergers. Subject of the benchmark was the development of unit costs and unit revenues of the merged airlines relative to the regional peer group. If an airline is able to increase unit revenues faster than their peers, the merger seems to have a positive revenue effect. It is questionable whether this effect comes from revenue synergies only, but it provides an indication for the success of different mergers. The same applies to the airlines' unit costs.

The financial benchmark shows that Air France-KLM and IAG were able to increase unit revenues faster than their peers (8-10pp outperformance) but suffered from even faster increasing unit costs (~15pp underperformance). Interestingly, unit staff costs were among the fastest growing costs compared to the benchmark. Given the fact that European airlines already suffered very high staff costs on a global scale, staff costs should bear a high potential for cost reduction by elimination of redundancies (Evripidou, 2012; Merkert & Morrell, 2012). Both Air France-KLM and IAG confute this assumption as their competitors were more successful in cutting staff costs. In conclusion, the European airlines were not able to reduce the cost factors that caused the cost disadvantage compared to other regions. This might be because of external factors like strong labor unions, high government fees and taxes, and high wages. However, there is no evidence that initiating cross-country mergers in Europe enables airlines to improve their competitive position.

In North America, the results are two-folded. Delta Airlines was able to outperform its benchmark in unit costs and to keep unit revenues at benchmark levels, hence improving the operating margin compared to the benchmark. United suffered the same phenomenon as European airlines with increasing unit revenues but even more rising unit costs. Both airlines were able to reduce leasing costs and selling expenses compared to the benchmark. While Delta Airlines was able to lower its unit fuel costs significantly by acquiring an own refinery, UnitedContinental's fuel expenses increased extraordinarily compared to the benchmark. Both airlines were able to reduce unit costs for selling expenses and aircraft leasing, while staff costs and MRO costs increased slightly. For the remaining cost items, there is no clear pattern for cost savings in North American mergers.

The evaluation of cost items in Latin America is very difficult due to the influence of currency exchange rates. AviancaTACA reports in Colombian Pesos which appreciated 25% against the US dollar between 2009 and 2012. At the same time, the Brazilian Real depreciated against the

US dollar which leads to skewed results for the benchmark comparison. Still, AviancaTACA was able to increase unit revenue slightly faster than unit costs, enhancing the operating margin compared to the benchmark. LATAM, in contrast, was able to reduce unit costs compared to the benchmark but suffered an even larger loss in unit revenue which decreased the margin. Both airlines were able to reduce unit costs for MRO and passenger services compared to the benchmark. The reduction in passenger services was expected as this cost item has been comparably high in Latin America. For all other cost items, there is no clear pattern.

Table 13 summarizes the cost item patterns derived from the case studies. Airlines in mature markets seem to incur extraordinary increases in staff and labor-intensive MRO unit costs, whereas Latin American airlines were able to reduce MRO unit costs. Besides this, there are no patterns for differences between mergers in mature and immature markets. The same holds for cross-country mergers and domestic mergers.

Table 13: Regional comparison of unit cost development compared to the benchmark

	Europe	North America	Latin America
Staff	+	+	N/A
Fuel	N/A	N/A	N/A
Fees & Charges	+	N/A	N/A
MRO	++	+	-
Selling expenses	N/A	-	N/A
Passenger services	N/A	N/A	- -
Charter	N/A	N/A	N/A
Aircraft leasing	+	- -	N/A
Depreciation	++	N/A	N/A

> 20% = ++ // 5% - 20% = + // -5% - +5% = 0 // -20% - -5% = - // <-20% = - - // N/A = undecided

Source: Own analysis

In summary, airlines across all geographies are likely to realize the initially estimated synergies if the analysis is based on company reported data. Domestic mergers in the US seem to realize synergies faster whereas mergers in immature markets seem to generate higher relative synergies. In Europe, there is no indication for a positive merger effect on unit costs and unit revenues compared the benchmark. In North America and Latin America, the benchmark analysis delivers mixed results with Delta and AviancaTACA improving their operating margin compared to the benchmark while UnitedContinental and LATAM suffered cut-backs in operating margins.

6 Conclusion

Various scholars have investigated the question whether a previous common alliance membership leads to more synergy potential for airline mergers. While Fritz (2005) argues in favor due to lower integration costs, Gudmundsson & Lechner (2006) find evidence for a reduced synergy potential. The cross-case analysis does not provide clear evidence on this topic. In two cases (Delta/Northwest and IAG), the airlines have been members of the same alliances prior to the merger. While Delta outperformed its benchmark successfully after the merger with an overachievement of synergy targets, IAG struggled with the post-merger integration and was not able to improve its competitive position. Delta Airlines is the combination of a same-alliance and domestic airline merger, whereas IAG is a cross-country merger. The quest for future research is to determine whether internationality factors play a significant role in facilitating mergers within the same airline alliance.

Merkert & Morrell (2012) stated the proposition that revenue synergies can be captured already in alliances whereas only mergers enable the extraction of cost synergies. Applying this hypothesis to the case studies, Delta and IAG should be able to extract less revenue synergies than the airlines without previous common alliance membership. Furthermore, their focus should lie on cost synergy extraction. The findings of the case studies provide little evidence for this proposition. IAG and Air France-KLM expect a similar distribution and similar relative values of cost and revenue synergies. Delta anticipates relatively more cost and less revenue synergies than United Airlines, but the general focus remains on revenue synergies. The synergy realization also shows that IAG achieved more revenue synergies than cost synergies, contrary to the estimate. The achievement of cost and revenue synergies seems therefore unrelated to previous alliance membership. The differences in cost structure provide a more consistent explication of possible variations in synergy achievements.

Furthermore, airline size seems not to have significant influence on synergy realization. Merkert & Morrell (2012) find evidence that the efficiency level of airlines is highest for mid-sized airlines and lowest for very large airlines with capacity in excess of 200bn ASK. Although Delta Airlines ranked as the world's largest airline after the merger with a capacity of over 300bn ASK, it is still the only case study merger which outperformed its peers in unit costs. If Delta Airlines is the exception that proves the rule, the findings of Merkert & Morrell (2012) could still hold as the other case airlines did not outperform their peers significantly. However, the benchmark panel contains mainly large carriers. Contrasting the performance of the large merged entities with mid-sized competitors could give a clearer picture.

The contribution to the scientific body of knowledge consists of three major findings, which derive from the answering of the research questions.

First, airlines in different regions have different cost structures, which motivate them to strive for different kind of synergies. European airlines burden very high unit costs compared to the global average and hence search mainly cost synergies in mergers. North American and Latin American airlines face not only lower unit costs but also lower unit revenues than the global average. Correspondingly, they estimate the revenue synergy potential of a merger to be higher than the cost synergy potential.

Second, synergy estimates between geographic regions differ not only in the cost/revenue synergy distribution but also in the absolute size of the estimated synergies. European airlines expect total synergies to equal 2.6% of combined pre-merger revenues, whereas North American airlines estimate 3.7% and Latin American airlines as much as 6.3%. These differences can be explained by larger synergy potentials in domestic mergers and among airlines from less mature markets.

Third, the realization of the estimated synergies is difficult to evaluate. Company reported synergy achievements indicate that all estimated synergies are achieved or overachieved during the integration phase. North American airlines seem to achieve their synergy targets faster than European or Latin American airlines; this indicates that the post-merger integration of domestic mergers is easier and faster than for cross-country mergers. Despite the reported synergies, all merged airlines but Delta Airlines have not shown superior operating margins compared to their benchmark airlines. Therefore, the synergies are either not significant or the airlines would have seriously underperformed their peers without the merger.

Limitations and suggestions for further research

The small sample of six airlines allows carving out similar patterns and deriving conclusions on potential relationships but it is not suited to prove these relationships empirically. Furthermore, the data on post-merger cost and revenue development is time inconsistent as the mergers happened between 2003 and 2011. The preconditions for these mergers were different as they happened in distinct phases of economic cycles. Concluding remarks on the success of all analyzed mergers cannot be made at this point of time as only Air France-KLM and Delta Airlines completed the post-merger integration. Hence, a comparison of company-reported synergy achievement is difficult and subject to errors due to data inconsistency. Unfortunately, there is no standardized reporting for all airlines which leads to inconsistent data on cost and revenue items. Efforts to standardize as much as possible have been made throughout this study, but – depending on the airline – between 5% and 15% of operating costs and revenues could not be allocated which could distort the results of the cost and revenue analyses. Integrating private information of the airlines could help to further enhance the reliability of the conclusions but would probably require the anonymization of case airlines.

Exchange rate effects also limit the interregional comparability of results. For the sake of comparison, the airline panel data is converted to US dollars using the average yearly exchange rate. The comparison of unit costs and unit revenue increases to the benchmark might be skewed by exchange rate fluctuations, especially in Latin America and Europe.

The propositions presented in the previous chapter could be tested empirically as soon as all airlines concluded their post-merger integration. Further, the sample could be extended to include mergers of smaller airlines, low-cost carriers, and airlines from Asia/Pacific and Middle East/Africa. An extended airline panel could also be used to further specify the findings of Merkert & Morrell (2012) on optimal airline size with cost and revenue components. Beyond the topic of merger synergies, future research could concentrate on the synergy realization in airline acquisitions, i.e. the take-over of a smaller airline by a larger airline, and contrast the results with the "mergers of (almost) equals" that formed this comparative case study.

7 List of References

Ansoff, H. I. (1965). *Corporate strategy: an analytic approach to business policy for growth and expansion*. McGraw-Hill.

Balz, U. (2003). *Das Praxisbuch Mergers & Acquisitions: Von der strategischen Überlegung zur erfolgreichen Integration*. München: Redline Wirtschaft.

Caves, D., Christensen, L., & Tretheway, M. (1984). Economies of density versus economies of scale: why trunk and local service airline costs differ. *The RAND Journal of Economics*, *15*(4), 471–489.

Chatterjee, S. (1986). Types of synergy and economic value: The impact of acquisitions on merging and rival firms. *Strategic Management Journal*, *7*(2), 119–139.

Davis, R., & Thomas, L. (1993). Direct estimation of synergy: A new approach to the diversity-performance debate. *Management Science*, *39*(11), 1334–1346.

Del Canho, D., & Engelfriet, J. (2008). Flying higher-together. *Business Strategy Review*, *19*(1), 34–37.

Doganis, R. (2010). *Flying Off Course*. *Auflage, London* (4th ed.). London: Routledge.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, *14*(4), 532–550.

Evripidou, L. (2012). M&A in the airline industry: motives and systematic risk. *International Journal of Organizational Analysis*, *20*(4), 435–446.

Fan, T., Vigeant-Langlois, L., Geissler, C., Bosler, B., & Wilmking, J. (2001). Evolution of global airline strategic alliance and consolidation in the twenty-first century. *Journal of Air Transport Management*, *7*, 349–360.

Flores, R. (1998). Competition and Trade in Services: The Airlines' Global Alliances. *The World Economy*, *21*(8), 1095–1108.

Fritz, T. (2005). Cooperation and Integration as Strategic Options in the Airline Industry - A Therotical Assessment. In W. Delfmann (Ed.), *Strategic management in the aviation industry* (pp. 223–254). Aldershot, UK: Ashgate.

Götsch, B., & Albers, S. (2005). Synergy Allocation in Strategic Airline Alliances. In W. Delfmann (Ed.), *Strategic management in the aviation industry* (pp. 275–303). Aldershot, UK: Ashgate.

Graf, L. (2005). Incompatibilities of the low-cost and network carrier business models within the same airline grouping. *Journal of Air Transport Management*, *11*, 313–327.

Gudmundsson, S. V., & Lechner, C. (2006). Multilateral airline alliances: Balancing strategic constraints and opportunities. *Journal of Air Transport Management*, *12*, 153–158.

Gudmundsson, S. V., & Lechner, C. (2011). Multilateral Airline Alliances: The Fallacy of the Alliances to Merger Proposition. *Air Transport in the 21st century* (pp. 171–183).

Gulati, R. (1998). Alliances and networks. *Strategic Management Journal*, *19*(4), 293–317.

Hansson, T., Neilson, G., & Belin, S. (2001). *Airline Merger Integration*.

Hosking, P. (2011). Hola! Fasten your seat belts. *The Times*, p. 47. London.

IATA. (2011). *World Air Transport Statistics 2011*. Montreal.

Iatrou, K., & Alamdari, F. (2005). The empirical analysis of the impact of alliances on airline operations. *Journal of Air Transport Management*, *11*, 127–134.

Iatrou, K., & Oretti, M. (2007). *Airline choices for the future: From alliances to mergers*. Aldershot, UK: Ashgate.

Jarach, D. (2004). Future scenarios for the European Airline industry: a marketing-based perspective. *Journal of Air Transportation*, *9*(2), 23–39.

Kleymann, B., & Seristö, H. (2004). *Managing strategic airline alliances*. Aldershot, UK: Ashgate.

Lawton, T., Rajwani, T., & O'Kane, C. (2011). Strategic reorientation and business turnaround: the case of global legacy airlines. *Journal of Strategy and Management*, *4*(3), 215–237.

Merkert, R., & Morrell, P. S. (2012). Mergers and acquisitions in aviation – Management and economic perspectives on the size of airlines. *Transportation Research Part E: Logistics and Transportation Review*, *48*(4), 853–862.

Morrish, S. ., & Hamilton, R. . (2002). Airline alliances—who benefits? *Journal of Air Transport Management*, *8*, 401–407.

Müller-Stewens, G., Kunisch, S., & Binder, A. (2010). *Mergers & Acquisitions: Analysen, Trends und Best Practices*. Stuttgart: Schäffer-Poeschel.

Nair, S., Fernández, M. P., & Ruiz, F. (2011). The analysis of airline business models in the development of possible future business options. *World Journal of Management*, *3*(1), 48–59.

Rajasekar, J., & Fouts, P. (2009). Strategic alliances as a competitive strategy: How domestic airlines use alliances for improving performance. *International Journal of Commerce and Management*, *19*(2), 93–114.

Rockholtz, C. (2002). Due Diligence-Konzeption zum synergieorientierten Akquisitionsmanagement. In W. Berens (Ed.), *Due Diligence bei Unternehmensakquisitionen* (pp. 177–199). Stuttgart: Schäffer-Poeschel.

Seth, A. (1990). Value creation in acquisitions: A re-examination of performance issues. *Strategic Management Journal*, *11*(2), 99–115.

Sterzenbach, R., Conrady, R., & Fichert, F. (2013). *Luftverkehr: Betriebswirtschaftliches lehr- und handbuch*. München: Oldenbourg.

Tanriverdi, H., & Venkatraman, N. (2005). Knowledge relatedness and the performance of multibusiness firms. *Strategic Management Journal*, *26*(2), 97–119.

Teece, D. (1982). Towards an economic theory of the multiproduct firm. *Journal of Economic Behavior & Organization*, *3*, 39–62.

Vom Brocke, J., Simons, A., Niehaves, B., Riemer, K., Plattfaut, R., & Cleven, A. (2009). Reconstructing the giant: on the importance of rigour in documenting the literature search process. *Proceedings of the 17th European Conference on Information Systems (ECIS)* (pp. 1–13).

Webster, J., & Watson, R. T. (2002). Analyzing the Past to Prepare For the Future: Writing a Literature Review. *MIS Quarterly*, *26*(2), xiii–xxiii.

Yin, R. (2013). *Case study research: Design and methods*. Thousand Oaks: SAGE Publications.

8 Appendix 1: Definitions

Synergies: Literature contains plenty of definitions of what synergies mean in a business context. Ansoff (1965) explains the synergy concept by the simple equation 2+2=5, pointing out that the combination of two individual parts creates more value than the separate individual parts. Some

scholars (e.g., Rockholtz, 2002) describe synergies purely as the increase in market value. However, this narrow view replaces the outcome (higher market value) with the root cause (the synergies themselves). Synergies are value enhancements that can derive either from less input factors needed to produce the same output or from a higher output with constant input factors. In both cases, one notes an efficiency enhancement that leads to value creation. A large proportion of literature on synergies focuses on the value creation mechanisms (e.g., Chatterjee, 1986; Seth, 1990) and postulates two generic ways of increasing the profitability of a company and thus generating (economic) value. Assuming that profitability is a function of revenues and costs, economic value can be created by either lowering the costs or by increasing revenues while holding the other variable constant (Seth, 1990). Teece (1982) develops the concept of sub-additive synergies where the individual parts can save costs by reducing redundant functions or processes if they combine their business operations. On the revenue side, super-additive synergies can create value by combining unique firm resources (Davis & Thomas, 1993). Tanriverdi & Venkatraman (2005) explain the emergence of revenue synergies with the "resource relatedness" concept which states that firms can increase the output by sharing related resources present within the different parts of the firm. The improved resource employment leads then to higher outputs of the combined entities.

For the course of this paper, the term "synergies" is differentiated between "cost synergies" which derive from the sub-additive value creation concept and "revenue synergies" which originate in the super-additive value concept. Götsch & Albers (2005) acknowledge the applicapbility of this synergy classification in the airline industry.

Mergers & Acquisitions: Companies have a variety of strategic and legal options, with different degrees of legal and financial independence, in which they can structure cooperations. These range from lose cooperation agreements to mergers and acquisitions, the most integrated option. According to Müller-Stewens, Kunisch, & Binder (2010), mergers and acquisitions are strategically motivated and comprise a subsequent integration or resale which implies "a transfer of competences in management, control and decision-making." (p. 12).

Acquisitions describe an asset or share purchase of a company by another company in which the acquired company loses its legal and economic independence. It is important to stress that strategic alliances can also include an equity participation but they are different from acquisitions because both involved companies maintain their legal and economic independence (Fritz, 2005). A merger can be either the integration of two formerly independent companies in the legal structure of one of the existing companies or it can be the foundation of a completely new legal entity. Both mergers and acquisitions are characterized by hierarchy-based decision making

(Fritz, 2005), in contrast to cooperative decision-making processes in strategic alliances or lose co-operations.

The airline sector has changed significantly with the evolution of global alliances since the early 1990s. Since this paper places the focus on airline mergers, it is important to delimit airline alliances from mergers. Gulati (1998) defines alliances as "voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies, or services" (p. 293). Morrish & Hamilton (2002) extend this definition by the "declared intention of improving competitiveness and thereby enhancing overall performance" (p. 401). Balz (2003) defines four characteristics of strategic alliances: they have a strategic focus, they are limited to specific fields of cooperation, they have often an inter-regional orientation, and the alliance partners maintain always their legal and economic independence. The last point is probably the sharpest distinction to mergers and acquisitions as in M&A transactions at least one of the involved partners loses its legal and economic independence.

Appendix 2: Regional airline benchmark panel

Europe	**North America**	**Latin America**	**Asia**	**Middle East/ Africa**
Lufthansa	Delta Airlines	LAN	All Nippon Airways	Emirates
Air France-KLM	United Airlines	TAM	Singapore Airlines	South African Airways
IAG	American Airlines	AviancaTACA	Qantas	El Al
SAS	US Airways	Aeroméxico	Cathay Pacific	Kenya Airways
Turkish Airlines	Air Canada	Copa Airlines	Air China	Ethiopian Airlines