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TITLE: Organizational Ambidexterity in Airline Companies	

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Abstract

The aim of this thesis is to clarify, how airlines balance their exploration and exploitation activities. In this research two factors were reviewed that could have a positive impact on airline performance. The paradigms of organizational ambidexterity as well as exploration and exploitation strategies are also reviewed.

Since deregulation the aviation industry has struggled with heavy competition and changing business models. To clarify how airlines balance their exploration and exploitation activities, a content analysis of airlines' annual reports was made. This thesis concentrates on 42 top performing airline companies. Hypotheses are tested through a longitunal analysis of 30 companies. The principal theories of organizational ambidexterity within airline transportation and tourism industry are reviewed. The positioning of airlines is also clarified. The empirical part of the research was implemented as a content analysis.

Key words: Organizational ambidexterity, Exploration, Exploitation, Aviation, Strategy, Competition, Deregulation, Low-cost airlines, Hub-and-spoke airlines, Yield management

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Introduction

Airline companies have struggled with profitability and cost effectivity since the airline deregulation started in United States in 1970's. The competition is fierce among the airlines, and modern passengers are price sensitive in terms of travelling. Both leisure and business travellers are keen on saving money by travelling affordably. Companies can practise exploration or exploitation strategies to improve their performance. However, organizational ambidexterity is taken place in a company strategy, when exploration and exploitation strategies are both being used to be successful. Ambidextrous organizations promote wide variations in products, technologies and markets as well as stay close to their customers being able to respond to market signals and being able to terminate unprofitable products (Mayle, 2006).

Aviation deregulation legislation became a law in the United States in 1978. The reason was high ticket fares within airline industry. The growth has been enormous: the number of air passengers increased from 207.5 million in 1978 to 721,1 million in year 2010 (Breyer, 2011). Airline revenue per passenger mile has in turn declined from 33.3 cent (1974) to 13 cents in 2010. Among other things overcrowded airports, delays and terrorist risks have been making air travel more difficult than earlier (Breyer, 2011). After American deregulation European situation was impacted immediately by discount fares, new airlines and many services being offered (Kawagoe, 2008).

According March (1991), exploration strategy comprises primarily search, variation, risk-taking, experimentation, play, flexibility, discovery and innovation. Whereas exploitation strategy can be defined as in terms of refinement, choice, production, efficiency, selection, implementation and execution. Jukka Uotila et al. (2009) have also studied exploration and exploitation strategies and financial performance. Their findings refer that corporate managers should concentrate more in securing adequate exploratory actions in addition to overemphasis on exploitation actions.

Organizational ambidexterity in airline companies has not been studied previously. Consequently the goal of this research is to study whether airline industry could gain from this theory. Also the competitive situation in aviation branch is being reviewed in this thesis as well as the strategic choices of aviation business in today's world and especially in Europe. As Lev (2001, p. 132) argues, "An enterprise's competitive survival and success will primarily depend on smart intangible investments leading to innovation and effective commercialization." Several innovations have taken place in the aviation industry since deregulation. The most affective innovation has been the low-cost airline branch.

The specific objectives of this paper are (i) to illuminate the exploitation as exploration operations, which airlines can take advantage of and which methods are widely in use already, (ii) to present findings from content analysis research, (iii) to present findings from the dataset collected from yearly Air Transport Statistics published by IATA and finally (iv) to portray the conclusions and suggestions for subsequent researches in terms of organizational ambidexterity and business strategies within airline industry.

In next section the theoretical and methodological background is examined. The paradigms of aviation deregulation and competition between airline companies are first discussed, then the theories of exploration and exploitation strategies as well as organizational ambidexterity are defined. Methodology and methods for studying organizational ambidexterity in airline companies are also addressed. In the second section of this paper, the research data are analyzed, including tables of the findings. In the conclusions a summary of the main findings is presented, research limitations discussed and implications drawn for knowledge related to airline industry business strategies. This thesis is based on my earlier paper "Organizational ambidexterity in airline companies" for Aalto University in Helsinki, Finland (2013) and it is based on quantitative research, but on the other hand it also has qualitative observations.

Theory and hypotheses

Aviation deregulation and competition

The aviation deregulation was introduced in the United States in 1978. It brought the strategic behavior, which had been an ongoing process in other competitive industries, to airline companies as well (Chan, 2000).

Market deregulation have increased the competitive pressures on companies, reducing the margin for error and rendering the “cult of cost reduction” crucial. It has been very apparent within the commercial airline business (Lawton, 2003). In a cost cutting cult, costs are cut in five ways: across the board reduction in budgets by 10 % to 20 %, elimination of a product range, closure of the business in a geographical area, elimination or outsourcing of a support service as well as reduction in discretionary budgets such as marketing, research and development, training and travel (http://www.changefactory.com.au/our-thinking/articles/the-cult-of-cost-cutting). Since the airline industry is offering so homogenous products, it may be connected directly to the cult of cost reduction.

European aviation market was changed dramatically in middle 1980's when a single market was created. The European Union liberalized the air transport sector in three stages: first, second and third packages (Kawagoe, 2008). Before the single market, was European air transport extremely regulated. Several countries had their own “flagcarriers” with governments support on expenses and negotiations.

According Kawagoe (2008): European air transport policy is firstly a part of EU regulatory mode, and secondly a category of “negative integration” (= measures which increase market integration by eliminating national restrains on trade and distortions of competition). A.E. Brown's (1987) definition for deregulation in commercial aviation is simultaneous termination of a regulatory instrument and adoption of a non-regulatory form of intervention. The competition in airline industry has had many significant features over

time, even before deregulations. Porter (1980) illustrated already in early 1980's that in airline industry there is a vast possibility, that the firm with the greatest capacity may get a disproportionate share of demand. Therefore the pressure to overbuild the capacity since multiple companies are aiming to capacity leadership is noticeable. The question of capacity is essential in terms of market share. The bigger capacity, the bigger market share the company is receiving and respectively lower costs and bigger profit as a result.

The outcome of deregulation

Daniel Chan (2000) argues that deregulated industry turned out to be very different from what was originally predicted. The existing carriers responded with innovative strategies to defend themselves against the new competitors. Due to the old and new rivals in airline industry, the carriers have been obliged to invent new business ideas and procedures as well as utilize the functional ongoing processes and standards. At present there are mainly two segments within air travel: main regional/global system markets operated by big and powerful hub-and-spoke class carriers as well as peripheral markets operated by weaker point-to-point carriers (Chan, 2000).

Hub-and-spoke networks link flight from numerous smaller "spoke" cities to a major "hub" city (Pender, 1999). The new entrants also tended to offer high frequency, low luxury and focus on low expenses as well as very efficient yield management (Schultz and Schultz, 2000). Since Ryanair in 1991 decided to pursue a new business model and transformed itself from charter airline to first European low-cost carrier, the low-cost flying really started to take off in Europe (Vlaar et al., 2005). After that, the world hasn't been the same in terms of commercial aviation. Flying has become extremely common type of transportation. And since the low-cost carriers as well as traditional hub-and-spoke carriers have decreased the on flight services, has the high-end glamour and extraordinarity also disappeared from people's mindsets regarding flying.

Airline alliances

The situation between established and new airlines is mainly the same as immediately after deregulation: new entrants are focusing on high-volume point-to-point markets, whereas established companies are for example building alliances, setting up frequent flyer programs, code-sharing and taking advantage on their size. The biggest airline alliances are Star Alliance with its' 26 member airlines (http://www.staralliance.com/en/), Oneworld with its' 16 member airlines (http://www.oneworld.com/) and 20 airline's Sky Team (https://www.skyteam.com/). According Kleymann and Seristö (2001) there is a potential for 2-4 percent revenue enhancement in a typical scheduled service airline through alliancing, disregarding airlines which operate in functional niche since they are most likely severely compromising their competitive advantage when entering an alliance at high integration levels.

Morrish and Hamilton (2002, p. 325) illuminate in their paper "Airline Alliances – Who Benefits?" the four advantages of alliances: access to new markets by tapping into a partner's under-utilized route rights or slots, traffic feed into established gateways to increase load factors and to improve yield, defense of current markets through seat capacity management of the shared operations as well as costs and economies of scale through resource pooling across operational areas or cost centers, such as sales and marketing, station and ground facilities and purchasing. However contrariwise than Kleymann and Seristö argued, Morrish and Hamilton (2002) claim, that there is no conclusive evidence that major airlines have been able to use global alliances to restrict competition and improve profitability. It is also noticeable, as Suen (2002) argues in her paper "Alliance Strategy and the Fall of Swissair" that the Swissair Group's bankruptcy is a direct consequence of mistakes made in implementing its alliance strategy. The alliance membership brings in a lot of new sales and marketing channels as well as other synergy advantages, but it also costs a lot of money for the new member company.

The price war

As mentioned earlier, the price war and competition is fierce, and according Graham et al. (2010) the increasingly competitive aviation market, challenges from the low-cost airlines and more transparent fare information on internet, signifies extremely sensitive customers in question of air fare changes. When comparing prices between airlines flying the same route, one can see that the price differences are very narrow, regardless the airline type. The airline pricing systems are based on demand and occupancy and the main driver is the internet. Products are priced according to demand measurer through direct access to booking for each customer. Hence during low demand periods, the prices are low, and respectively during high demand the prices are high. This dynamic pricing strategy has generalized within other areas of tourism industry, such as hotels and cruise products and even taxi companies in US.

The only difference between the situation almost 40 years ago is that the new low-cost airlines nowadays may have newer fleet than the established rivals. Nevertheless, as Gursoy at al. (2005) write, the persistent monitoring of the business environment and target customers' changing wants and needs enables airlines to be proactive and come up with the best strategy in the fast changing environment.

Nevertheless, the European low-cost carriers have had a significant impact on the structure and profitability of the European airline industry and the growth of intra-European passenger traffic (Vlaar et al., 2005). The maturity of air transport market has also been discussed and specifically European market. According Graham (2006) the overall leisure travel market seems to be near to full maturity and air-travel growth may have to come primarily from increased market penetration. Whilst this is the case, Graham (2006) continues: the annual growth of long-haul travel has been predicted to grow 5.4 percent until year 2020. For example American tourists have found the South East Asia as a holiday destination. Also Asian people then again have better opportunities to fly long-haul routes to Europe and America because of the improved economic situation in many Asian

countries. Especially in Europe have Chinese and Korean tourists become a significant incoming group.

European structural weaknesses

Structural weaknesses of European aviation before deregulation were:

Member states licenced airlines owned and controlled by their nationals.
Member states licenced international air service s bilaterally.
Only one airline from each state was permitted to fly each international route.
Capacity was usually split on to a 50/50 basis as the two airline fleets permitted.
50/50 revenue split between the two airlines regardless of the pattern of revenue receipts.
Fares were decided on a bilateral basis by the airlines, subject only to ratification by the national regulatory authorities.
Normally, designated airlines were particularly or wholly under state ownership.
State-owned airlines were in many cases in receipt of state subsidies of various types and/ or had their operating losses written off.
Bilateral agreements between states authorized non-scheduled flights catering for the tourist trade.

Table 1, Structural weaknesses of European aviation before deregulation
(Armstrong and Bulmer, 1998, p. 173)

The structural weaknesses presented above are probably mainly affected by the level of the state ownership. In Europe the supply of the air transport services before the deregulation was heavily concentrated in the hands of major airlines. As Chang and Williams (2002, p. 110) argue in their research “European major airlines’ strategic reactions to the Third Package” that “it is interesting to observe, that the most financially successful airlines are the ones with the least amount of government shareholding.”

The American airline companies have as well due today struggled with financial difficulties, the biggest carriers have all been through bankruptcy, wringing out many of their costs. Since they have learned how to charge separately from baggage, meals etc. (The Economist, 2013). This is a very big difference in air travelling compared to previous decades of aviation. Earlier the passenger had all service automatically purchased with the flight ticket. The luggage, meals, drinks etc. were inclusive. Now it is very common, that everything else is upon extra charge besides the flight. Many companies have also terminated the catering from short-haul flights altogether. Also first class tickets and services have been vanished upon several airlines.

However the European skies were also liberated to free competition. Nevertheless, attempts by lower-cost airlines to enter the market were blocked by denial of landing slots at main traffic hubs, or by anti-competitive or even illegal behavior (Rae, 2001). Since 2001 EasyJet and Ryanair have been the largest European low-cost carriers. However, according Rea (2001), most of the European low-cost carriers have remained small, focusing on a specific market niche or have been acquired or merged or have discontinued trading.

As Harrington et al. (2005) research in their case study “Embracing and Expoiting Industry Turbulence: The Strategic Transformation of Aer Lingus”, only few (European) airlines are any longer in a position to move so slowly towards profitability as their pattern used to be with new routes: “Aer Lingus abandoned established route development plan and simply inaugurated service to new, promising destinations – most clearly outside the established Aer Lingus pattern”. As mentioned earlier, there have been many changes within European aviation since deregulation. One rival in European transportation scene is railway, especially in shorter European routes. Since Eurostar was launched, it is claimed to have captured more than 50-55 percent of the London-Paris market in 1996 (Pender, 1999).
Many established companies which have survived the 9/11, Afganistan was, SARS epidemic etc. had to adapt to new situations. The size is not necessary any more the best value, but adaptability (Harrington et al., 2005). I think this is the reason, why so many airlines have transformed their strategies towards extremely efficient yield management.

Yield management

Wardell (1989) illustrates yield management operations followingly:

- Yield management is basically the combination of processes, analysis, and techniques a vendor applies to the types of products it offers in order to induce (or compel) its customers to pay as much as possible. Airlines employ yield management not only to keep their airplanes full, but equally as important, to sell as many high priced seats as efficiently as possible.
- To be successful, the techniques are usually highly automated, because they entail difficult and complex calculations, real-time monitoring of sold inventory, and constant updates. The techniques can be quite basic (simple overbooking, however managed, is a form of yield management), but the trend is decidedly toward the greater precision and reliability that comes only from more sophisticated automation.
- Yield is a complex word that can refer to profitability in a number of ways, but the essence of being in business is to manage the greatest possible spread between costs and revenues, in other words executing effective yield management.
- Yield management also entails making discounted inventory available for certain travelers (those able to meet the tightly managed restrictions), thereby improving usage levels and creating greater efficiency, but this definition misses the point. Limiting the applicability of "discounted" inventory in any form means that some travelers are "destined" to pay more than others.
- By elastic demand people who can be induced to use a service (or proselyted from a competitor) if the price, or other circumstances, are right. Elastic demand should be encouraged as much as possible, using whatever incentives (usually by discounting, with restrictions to "protect" inelastic demand), because the alternative is having empty seats at the flight.
- The vendors are continually trying to improve their skill at drawing the elastic/inelastic line. This manifests itself, for example, when discounted airline seats are made available shortly prior to travel date after the airline's yield management techniques predict the majority of inelastic demand is satisfied.

As mentioned earlier, yield management and dynamic pricing have deployed to all branches in tourism industry. However, some operators have on the contrary given up yield management and changed their pricing system back to static. The reasons for aforesaid operation are high personnel costs due to revenue managers, incoherence for the sales persons without extremely precise work of the revenue team as well as customer irritation about the confusing and unpredictable pricing jumble. There are also extreme cases of yield management: in the case of emergency due to storms, ash clouds or other natural disaster, the airline, lodging and even taxi companies have raised their prices to astronomical amounts. This can be concentrated as a precarious activity in several cases.

Ambidextrous organizations

Organizations should combine both exploration and exploitation strategies to be successful. Nevertheless, several researchers have studied, that combining those two strategies is not simple. Ambidexterity is – according O'Reilly and Tushman (2004) – one of the toughest challenges which managers can meet. "The intent of exploitation is to respond to current environmental conditions by involving the use of explicit knowledge bases, whereas exploration aims at driving latent needs by means of tacit knowledge bases" (Kauppila, 2007, p. 6).

Ambidexterity within airline companies was explored in this research. A lot of investigation has occurred within organizational ambidexterity and organizations. Behavioral context, organizational structures and leadership processes have been represented as promoters of ambidexterity (Raisch and Birkinshaw, 2008). In airline industry the ambidexterity has nevertheless not yet been studied.

As Vlaar et al. (2005) suggest that in attempting to find a balance between the exploitation of their current activities and exploration of emerging opportunities, incumbents of the European airline industry should search for compromises. Since managing ambidextrous

organizations is really challenging, the airline industry has yet another challenge in their turbulent journey. As Tushman and O'Reilly argue (2002) that the managerial challenge is to create co-existing highly differentiated and highly integrated organizations. Without integration, the ambidextrous organization is not operative. Keeping several organizational patterns moving at the same time is a challenge for the executives. "Winning through innovation is about innovation and execution" (Tushman and O'Reilly, 2002, p. 179). In order to innovate and execute the innovations the company has to have a good well understood business and the organization should be in control of its present operations.

Managerial roles in leading innovation and change

The manager as:	Role:
Architect	Building fit, consistency and congruence of structures, human resources and cultures to execute critical tasks in service strategy, objectives and vision.
Network Builder	Managing strategic change by shaping networks and coalitions down, across, up and outside manager's unit.
Juggler	Hosting contradictory strategies, structures, competencies and cultures in service of incremental, architectural and discontinuous innovation, as well as integrating these contradictions with a clear vision.

Table 2, Managerial roles in leading innovation and change
(Tushman and O'Reilly, 2002, p. 225)

As mentioned above, the organizations and the management should be highly integrated to be successful. This also applies to the managerial roles. Therefore the roles in table 2 are seldom strictly definite, but it gives a good conception about managerial roles in leading innovation and change. Rightfully the power status of the manager is also always a very important factor in terms of exploration and exploitation in relation to significant actors in organization.

The creation of new values

The creation of new values, may take several forms. In airline industry, in the case of EasyJet, it is in the growth of business that successfully creates and exploits a new source of customer demand (Rae, 2001). When Aer Lingus fought for its survival in early 2000, they exploited the turbulence in aviation industry with acceptance of changing environment, the action phase as well as adherence to consistency in value creation (Harrington et al., 2005). As ambidextrous organizations and the leadership, according Tushman and O'Reilly (2002) they should be able to compete successfully in both the short term through increasing the alignment or fit among strategy, structure, individual competencies, culture and processes while simultaneously prepare for the inevitable organization revolutions required by shifting innovation streams.

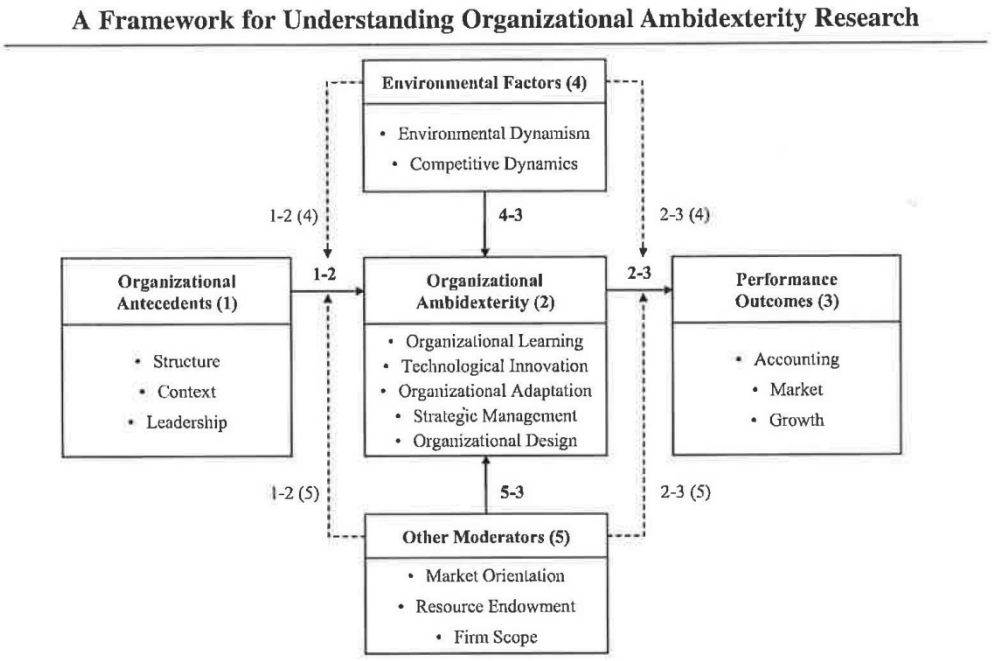

Figure 1, (Raisch and Birkinshaw, 2008, p. 381)

A network model of ambidexterity (Kauppila, 2007):

Proposition 1

Companies make each other ambidextrous by supplementing each other's and outside knowledge and other resources.

Proposition 2

Firms employ networks to supplement their capability to explore and exploit simultaneously. Firms use two types of networks: one is for enhancing current business and incremental innovation, the second for enhancing future business and introducing radical innovation. These occur through one stretched business network or multiple networks.

Proposition 3

The optimal level of the two orientations at the company level is reached when individual innovation processes specialize in one or other of the orientations, but not both.

Proposition 4

In the network-environment, only top-level management needs to have an unconditional ambidextrous attitude. There must be experts of both orientations involved in the respective innovation processes. A company does not necessarily have to employ any experts, provided the required expertise is available for the processes elsewhere.

Proposition 5

Company needs expansive sources of relevant and continuously circulating tacit knowledge in order to keep its explorative innovation processes running. In explorative processes, explicit knowledge exists more in background, as it aggregates it can alter processes via its slow and steady influence on tacit knowledge basis. Exploitative processes need rapidly circulating explicit knowledge. Tacit knowledge operates in exploitative processes subtlety by aggregating and then structuring explicit knowledge.

Proposition 6

Exploitative processes ultimately strengthen explorative processes and are essential for their survival. Explorative processes do not have a similar effect on the survival of exploitative processes because explicit knowledge is always available in the market.

Proposition 7

Explorative innovation processes depend more on intimate relationships than do exploitative innovation processes. These relationships are usually horizontal in their nature, such as collaboration with research partners. Exploitative processes can also benefit from more arm-length collaboration. Their relationships are more commonly vertical such as collaboration with customers.

Zeki Simsek at al. (2009) represented a two-by-two typology which outlines four types of ambidexterity: harmonic, cyclical, partitional and reciprocal. Harmonic ambidexterity signifies practicing both exploitation and exploration strategies concurrently within organizational unit. When organizations practice in long periods of exploitation interspersed by random periods of exploration, they are practicing cyclical ambidexterity. In other words, cyclical ambidexterity is a type of ambidexterity in which organizations engage in long periods of exploitation, interspersed by sporadic episodes of exploration (Simsek et al., 2009). Partitional ambidexterity means that different units are having their own incentive systems, cultures, structures and strategies. In conclusion, as explained by Simsek et al. (2009), reciprocal ambidexterity stands for consecutive tendency of exploration and exploitation across units. According de Kloet (2012) instead of only pursuing exploitation and exploration within one unit with the same group of people (cyclical), it might be necessary to work across unit or even organization borders in order to achieve specific objective(s). For example, during a period of exploration certain knowledge or resources might be necessary, that are only available outside the unit. If this is the case an organization, unit or department will tend to incline more towards reciprocal than cyclical ambidexterity.

Nonetheless, Lavie et al. (2010) suggest, that exploration-exploitation should not be viewed as continuum, but instead as an option between separate alternatives. They also

argue that organizations' functions are proceeding toward exploitation "as long as the organization persists within an existing technological trajectory and leverages its existing skills and operations" (Lavie et al., 2010, p. 114). Several different propositions were listed above by Kauppila (2007). The options between alternatives are also constitute a fundamental perspective for this thesis. The airlines are practicing several business activities and balancing between the alternative operation directions such as the level of inclusive services, the scope of networks, the fleet size and age as well as the yield management decisions. The executives of the airline companies have a demanding task to select and maintain the strategies which should generate long term profit and try to avoid the "cult of cost reduction" which was covered in page 6.

Balancing Mode	**Contextual Ambidexterity**	**Organizational Separation**	**Temporal Separation**	**Domain separation**
Locus of balance	Individual and group levels	Organizational level	Organizational level	Organizational level
Mechanism of balance	No buffers between concurrent exploration and exploitation	Separate units dedicated to either exploration or exploitation, simultaneously coordinated at the corporate level	Sequential shifts over time from exploration to exploitation and vice versa	Exploring in one domain while simultaneously exploiting in another
Management role	Management provides a supportive infrastructure	Proactive management is essential	Proactive management is essential	Proactive management is not a necessary condition
Challenges	Managing contradictions within organizational unit	Coordinating across units and managing contradictions at the senior management level	Managing transitions between exploration and exploitation and dislodging from inertial pressures	Identifying applicable domains and deciding whether to explore or exploit in any given domain

Table 3, Alternative Modes of Balancing Exploration and Exploitation
(Lavie et al., 2010, p. 13)

Ambidextrous organizations are been alleged to provide the means to survive in business world today as well as in the future. Tushman and O'Reilly (2004) determine ambidextrous organizations followingly: organizations with internally inconsistent competencies, structures, and cultures, yet with a single vision. For management there are options which they can proactively shape innovations concerning their business activities. They also give an illustrative example of airline industry: British Airways' cultural revolution in late

1980’s permitted major process innovations in their customer service processes which lead to major change of passenger expectations of customer service and in corporate result respectively.

Annual reports

The research was conducted within airlines’ annual reports as the sample. This was very interesting study, because annual report is, as Courtis (2002) illustrates, normally the leading and most visible of corporate documents and it provides management a unique opportunity to impress its readers. Since I have worked several years within marketing in tourism industry, this was a good opportunity to familiarize with corporate communication from the annual report aspect. I agree with Quattrone (2000), that annual reports comprise a relatively unified genre, and that they are well worth studying.

The reports include usually more than plain financial data. Various legislations of different countries dictate the contents of the annual reports. The reports include i.a. description of operations, significant changes in its state of affairs, principal activities and major changes in them, specific and material events arising between the end of financial year and the publication of the report which may affect future operations, other developments as well as activities on the environment and corporate governance (Courtis, 2002). In this thesis the annual reports studied were from different countries and continents. The information is handled from different aspects in diverse countries. As Camfferman and Cooke (2002) argued, the disclosure by U.K. companies is more comprehensive than by Dutch corporations and the difference is significant. Most of the key areas of disclosure are found to be more comprehensive in the U.K. than in The Netherlands. This is due to more stringent regulation in the U.K. than in The Netherlands where the approach is more flexible. Previous Camfferman’s and Cooke’s (2002) example is only one paradigm about the difference in the contents of annual reports. The key concepts of corporate communication such as mission and vision statements are commonly represented in annual reports. Both mission and vision definitions are portrayed in table 4.

Concept	Definition
A mission	A general expression of the overriding purpose of the organization, which is in line with the values and expectations of major stakeholders and concerned with the scope and boundaries of the organization. "What business are we in?"
A vision	The desired future state of the organization. An aspirational view of the general direction that the organization wants to go in. Formulated by senior management. Requires the energies and commitment of the members of the organization.

Table 4, Definitions of mission and vision (Cornelissen, 2011, p. 9)

In this paper the mission and vision statements of the airlines which represent as a sample in this research are introduced later.

Hypotheses

According Jensen (2009), organizational ambidexterity is positively related to a company's financial performance in terms of profitability and return on invest. Exploitation activities can lead to a positive short-term performance, as exploration activities help the company to create new knowledge and create capabilities for long-term prosperity (Uotila, 2008). However Jansen (2009) argues that companies with a low level of exploratory and exploitative innovation do not necessarily increase their financial performance. Hence, ambidextrous organizations need to have high levels of both types of innovations to reach high levels of financial performance in terms of profitability and return on investment.

Hypotheses for this research are:

Hypotheses 1: Exploration strategies have a positive impact on airline performance.
Hypotheses 2: Exploitation strategies have a positive impact on airline performance.

Model

The hypotheses was tested by a dynamical longitunal panel data research. The longitunal panel data research follows a given sample of individuals over time and thus provides multiple observations on each individual in the sample. The panel data research provides a means of resolving or reducing the magnitude of a key econometric problem that often arises in empirical studies, that the real reason one finds (or does not find), effects the presence of omitted (mismeasured on unobserved) variables that are correlated with explanatory variables. By utilizing the information on both the intertemporal dynamocs and the individuality of the entities being investigated, there is a better possibility to control in a more natural way for the effects of the missing or unobserved variables. (Hsiao, 2003)

I used GMM estimator to control for endogeneity and unobserved heterogeneity. Arellano and Bond (1991) developed a Generalized Method of Moments estimator that treats the model as a system of equations, one for each time period. The equations differ only in their instrument/moment condition sets. The predetermined and endogenous variables in first differences are instrumented with suitable lags of their own levels. Strictly exogenous regressors, as well as any other instruments, can enter the instrument matrix in the conventional instrumental variables fashion: in first differences, with one column per instrument. A problem with the original Arellano-Bond estimator is that lagged levels are often poor instruments for first differences, especially for variables that are close to a random walk.

The xtabond2 Stata Module was used to estimate the system GMM. Due to large number of variables observed over many years, the models were tested as well by limiting the number of instruments to the first available lagged levels, with similar results.

Empirical studies and findings

Sample

For this research, I collected data of 42 major airline companies and their annual reports covering years 1996–2006. 30 airline companies of 42 companies were members of International Air Transportation Association (IATA). The International Air Transport Association is the trade association for the world's airlines, representing over 80% of total air traffic. IATA supports many areas of aviation activity and helps formulate industry policy on critical aviation issues. (http://www.iata.org/about/Pages/index.aspx)

The data from yearly Air Transport Statistics published by IATA was also collected. The data collected was weight load factor, fleet, utilization time and country. All this information was collected per year per airline per indicator in question. The information was compiled to an excel table. There was altogether 414 rows of information in the excel file. Weight load factor indicates tonne-kilometres performed by airline expressed as a percentage of tonne-kilometres available. Fleet size indicates the number of aircraft the company is operating with during the fiscal year and utilization time stands for the average quantity of hours, the fleet of the airline company are being utilized daily. The country of origin was also listed in the excel file. Below are critical examples of utilization time, weight load factor and country of origin within airline industry. The examples illustrate the significance of those three factors concerning the business models in aviation branch.

Utilization time

According Costa et al. (2002) the highly efficient utilization of aircraft and the purchase of low-cost used aircraft are strategies which have succeeded in keeping costs considerably lower. The high utilization model carriers also design their routes to maximize the use of their aircraft as well as use the same type of the airplanes in whole network to save in maintenance and training costs (Costa et al., 2002). Good example of maximizing the

aircraft use and using the same type of the plains is Norwegian Air Shuttle ASA, they operate 89 jet aircraft, of which 76 are 737-800s, 10 are 737-300s and three are 787-8 Dreamliners (http://www.norwegian.com). The new aircrafts are reducing 23-33 % less CO^2 emissions than older planes and the fuel consumption is also lower.

Low-cost airlines also take advantage of cost savings when using smaller, less congested airports and operating at off-peak departure times (Costa et al., 2002). Southwest airlines is one of the pioneers in highly efficient point-to-point short-haul commuter and leisure fly company; it became the world's most profitable airline due to intensive efficient fleet utilization, fast turnaround times as well as crew flexibility (Rae, 2001). The average utilization time of the aircraft is around seven hours per day for established carriers, and as much as eleven hours for low-cost airlines.

As Thomas Lawton (2003) argues, the nature and strategic objectives of an airline also determine the productivity and cost differ. Consequently short-haul carriers have higher aircraft utilization and bigger yields than long-haul carriers.

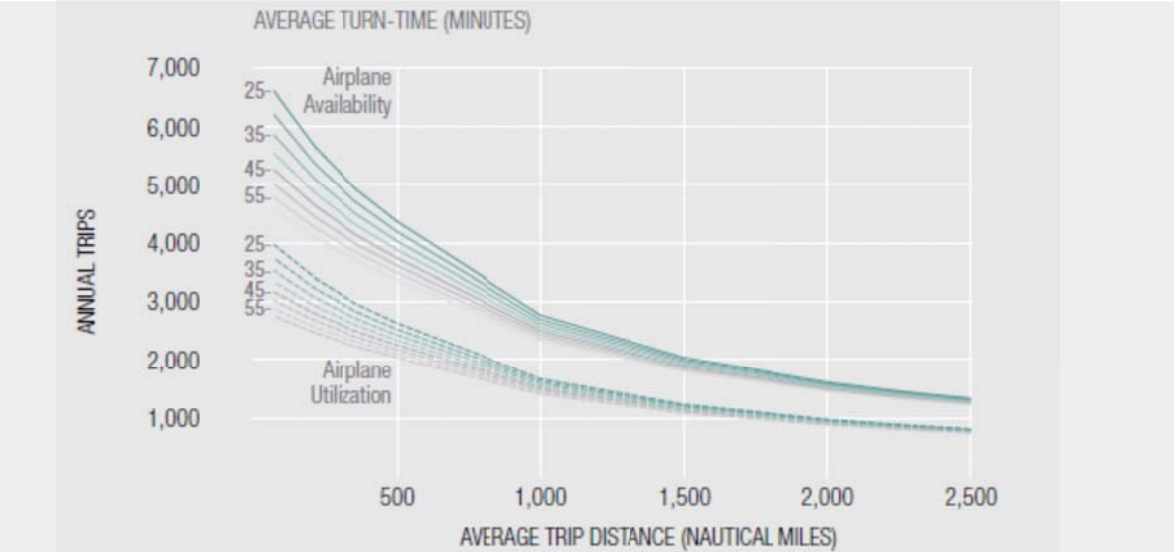

Table 5, Airplane availability as a function of average trip distance
(Mirza 2008, p. 16)

Airplane availability (in terms of number of trips) is quite sensitive to average turn-time for shorter average trip lengths. In this graphic, the solid lines represent the maximum number of annual trips for which an airplane is available as a function of average trip distance using various incremental turn-times. Additional operational factors further limit achievable airplane utilization which is captured in network efficiency factors. The dotted lines represent actual airplane utilization: airplane availability (maximum possible trips) multiplied by network efficiency (which is less than 100 percent by definition). (Mirza 2008, p. 16)

Weight load factor

As mentioned earlier, the competition in airline industry is fierce. For several carriers, the gap between the breakeven and the essential load factor is small, so even a minor loss in traffic can signify as an operating loss (Lawton, 2003).

Raising load factors by moving from three to two engine plains (fuel savings and reduction of the cockpit crew size) could lead to significant profit improvements. However load factors are reaching their limits, which means that major profit improvements are not anymore so easily reachable without modifications to business models and labor relationships. (Costa et al., 2002) Therefore the industry is in need of new innovations and discources.

Low-cost airlines have reached very high load factors. Schultz and Schultz (2000) tell in their article “The Case of Morris Air: A Successful Startup” how the fledgling airline Morris Air’s low-cost, low frequency strategy guaranteed 85-95 percent load factors. As David Rae (2001) explored the concept of entrepreneurial management through a case study of the low-cost airline EasyJet, he introduced the simple EasyJet model: achieving maximum aircraft utilization at maximum load factor on point-to-point flights, minimizing overhead costs. Also airlines which have participated in alliance have gained from the

alliance membership in terms of load factors and general rise in productivity levels (Morrish and Hamilton, 2002).

Table 6, Passenger load factors for hub-and-spoke and point-to-point carriers
(Mirza 2008, p. 19)

Although they have longer turn-times, hub-and-spoke carriers tend to have higher passenger load factors. (Mirza 2008, p. 19)

Country/continent

There are differences in company operations according country of origin. The German and Japanese favor a pattern of long-term employment and evolutionary capability building in companies, whereas higher rate of employee turnover in Anglo-American companies and revolutionary capability building patterns reflect the more deregulated nature of financial and labor markets in the US and UK (Lehrer, 2000). The airlines within this research are

from many different countries. However most of the airlines are from Europe or United States. A few Asian airlines are however also represented in this research.

The airlines within research

The airlines within this research are shown below in alphabetical order. The official company logos, country of origin and mission or vision statements are reviewed as well. All airlines represented are members of International Air Transport Association (IATA). Some of the airlines have disbanded their operation, but most of the listed airlines are significant factors in aviation industry. As mentioned earlier, the key concepts of corporate communication such as mission and vision statements are commonly represented in annual reports. As demonstrated, in terms of mission and vision statement of these companies, there is a vast contention between the contents of the statements. That gives and interesting modifier for this research and the results.

AerLingus (Ireland)
Mission statement: To connect Ireland with the world and the world to Ireland by offering its customers the best product in the Irish airline market to customers at a competitive price. (http://careers.aerlingus.com/mission-and-values/)

Air Canada (Canada)
Mission: Connecting Canada and the World.
(http://www.aircanada.com/en/about/career/about_mission.html)

Air New Zealand (New Zealand)
Vision: We will strive to be number one in every market we serve by creating a workplace where teams are committed to our customers in a distinctively New Zealand way, resulting in superior industry returns.
(http://www.airnewzealand.co.nz/corporate-profile)

Alaska Airlines (USA)

Mission statement: At Alaska Airlines, our employees share an uncommon blend of integrity, professionalism, caring, resourcefulness, and spirit. Every day we strive to bring these values to life through behaviors and deeds that go above and beyond the ordinary - what we call "North of Expected" and Alaska spirit in action.
(http://www.alaskaair.com/content/about-us/sustainability/our-mission.aspx)

Alitalia (Italy)

Mission: Proud to show the best of our country. With passion.
(http://corporate.alitalia.com/static/upload/ali/alitalia-presents-the-new-industrial-plan-2013-2016.pdf)

All Nippon Airways (Japan)

Mission: We always, as a general trading company group and major subsidiary of ANA Group, create a new additional value and contribute to the achievement of wealthy society.
(https://www.anatc.com/en/company/mission.html)

America West Airlines (USA)

Merged into US Airlines in 2006.

American Airlines (USA)

Mission statement: AMR Corporation is committed to providing every citizen of the world with the highest quality air travel to the widest selection of destination possible. AMR will continue to modernize its fleet while maintaining its position as the largest air carrier in the world, with the goal of becoming the most profitable airline. AMR is the airline that treats

everyone with equal care and respect, which is reflected in the way each AMR employee is respected.
(http://www.aa.com/i18n/aboutUs/corporateResponsibility/profile/amr-corporation-at-a-glance.jsp)

Austrian Airlines (Austria)
Mission statement:
Our Company, our Foundation
The Austrian Airlines Group ("Austrian") occupies a leading position in Austria's aviation industry, and is an integral part of Lufthansa, Europe's largest airline group. We are committed to high quality, and assert ourselves in European competition. Our attractive network connects East and West. The basis of our flying activities is the Vienna hub.
The Austrian Airlines Group is distinguished by its profitable, forward-looking and modern actions, and combines the history and know-how of the companies united within it. Together, these form the integrated trademark "Austrian". Our aim is to grow on an economically healthy basis, and by our own efforts.
Our Customers
Our customers expect technical reliability, punctuality, and an orientation to service. And as a leading quality airline in Europe, we offer all of these. But we offer even more: In accordance with our motto, "We carry Austria in our hearts, and ever more customers into the world," we do everything to ensure our customers look forward to their next flight with Austrian.
Our Team
Our employees are the crucial reason why we are inspiring ever more people to travel with Austrian. They show huge personal commitment every day, and form a strong team with their wide-ranging history. Cooperation is based upon respect and appreciation. Our managers are role models, motivate and give direction.
This is the Mission Statement of the Austrian Airlines Group. 6,000 employees worked together to design it in 2012.
(http://www.austrianairlines.ag/AustrianAirlinesGroup/Profil/MissionStatement.aspx?sc_lang=en)

British Airways (UK)

Mission statement:

One Destination seeks to ensure our customers fly confident that, together, we are acting responsibly to take care of the world we live in.

(http://www.britishairways.com/cms/global/microsites/ba_reports0910/pdfs/Strategy.pdf)

Braathens (Norway)

Mission: To present airlines in Europe with a flexible, strategic tool, performing cost efficient and reliable operations with regional aircraft.

(http://www.braathensregional.com/about-braathens-regional)

Cathay Pacific (Hong Kong)

Vision: To be the world's best airline. Being the best means that we always strive to excel in everything we do. Our dynamic team provides the highest quality service so that our customers are happy they chose Cathay Pacific.

(http://www.cathaypacific.com/cx/en_GB/about-us/about-our-airline/vision-and-mission.html)

China Eastern Airlines (China)

No mission or vision found.

China Southern Airlines (China)

Corporate vision and mission: Becoming a carrier as the best choice for customers and loved by the staff and employees.

(http://www.csair.cn/en/pages/HopeAndDuty.aspx)

Continental Airlines (USA)

Merged into United Airlines in 2010.

Czech Airlines (Czech Republic)

No mission or vision found.

Delta Air Lines (USA)

Core values: Always tell the truth, always keep your deals, don't hurt anyone, try harder than all our competitors—never give up, care for our customers, our community and each other.

(http://www.delta.com/content/dam/delta-www/pdfs/policy/delta-rules-of-the-road.pdf)

Iberia (Spain)

Mission: To offer air transport, airport services and aircraft maintenance services that come up to our customers' expectations and create sustainable economic and social value.

(http://grupo.iberia.es/content/GrupoIberia/RSC/Clientes/Corporate_Social_Resp_PolicyIB.pdf)

Japan Airlines (Japan)

Vision and mission: To be a leading company in Technical Support, Construction and Manufacturing with a commitment for excellence.

We are committed to deliver top quality products, customized services and innovative solutions to our Clients, Employees, Business Partners and Community while retaining continuous growth in our market of operation.

(http://www.jalinternational.com.sa/vision-mission.php)

Lauda Air (Austria)

Merged into Austrian Airlines in 2012.

Lufthansa (Germany)

Mission statement: We are Europe's Airline Powerhouse connecting Europe with the world and the world via Europe with our global services.

The customer is the centre of our attention: we provide reliable services for passengers and air-cargo. Seamless cooperation with our partners strengthens us in a volatile environment.

As the world's leading aviation group, we are the global leader in selected aviation services.

Our highly motivated and dedicated team stands for superlative quality. Our corporate culture and its value concepts are defined by entrepreneurship and collaboration, in an atmosphere of transparency, trust and diversity.

Our target is to grow profitably and maintain a healthy financial structure, to enable investment in the development of our business, fleet, products and people.

We are committed to sustainable development and assume our ecological, civic and social responsibilities.

(http://www.lufthansagroup.com/en/responsibility/economic-sustainability/group-strategy.html)

Northwest Airlines (USA)

Merged into Delta Air Lines in 2008.

Quantas (Australia)

No mission or vision found.

Ryanair (Ireland)

Objective: To firmly establish itself as Europe's leading low-fares scheduled passenger airline through continued improvements and expanded offerings of its low-fares service. Ryanair aims to offer low fares that generate increased passenger traffic while maintaining a continuous focus on cost-containment and operating efficiencies.
(https://www.ryanair.com/doc/investor/Strategy.pdf)

SAS (Norway, Denmark, Sweden)

Mission: We provide best value for time and money to Nordic travelers whatever the purpose of their journey.
(http://www.sasgroup.net/SASGROUP_FACTS/CMSForeignContent/SASGroup_company_presentation_2013.pdf)

Singapore Airlines (Singapore)

Mission statement: Singapore Airlines is a global company dedicated to providing air transportation services of the highest quality and to maximising returns for the benefit of its shareholders and employees.
(http://www.singaporeair.com/en_UK/about-us/)

Swiss (Switzerland)

Values: SWISS is the national airline of Switzerland. Its origins commit it to the highest product and service quality. And because its size is manageable, SWISS is able to be closer to its guests and provide them with more individual care.
(http://www.swiss.com/corporate/en/company/about-us/company-profile)

Thai Airways (Thailand)

Vision: to set our goal to public and use it as the guideline for all units to achieve the same goal “The First Choice Carrier with Touches of THAI”. While focusing on building shared value to raise the main value e.g. focus on customer satisfaction building, operation under effective capital and budget through flexibility to support the change of circumstance in business operation and to create a response to confederate with balance. (http://www.thaiairways.com/en/about_thai/company_profile/index.page?)

United Airlines (USA)

Mission: United is committed to supporting the rich diversity of ideas, experiences and cultures that reflect our co-workers, customers and business partners. By working together with dignity and respect, United strives to create an inclusive work environment where all co-workers are equally empowered to contribute to our success. (https://www.united.com/web/en-US/content/company/globalcitizenship/diversity.aspx)

US Airways (USA)

Mission statement: Customer service has always been a priority at US Airways, and we are committed to making every flight count for our valued customers. Our promise to you: The safety and satisfaction of our customers is a top priority for our airline. (http://phx.corporate-ir.net/phoenix.zhtml?c=117098&p=irol-IRHome)

Measures

In this chapter the measures of the research are being demonstrated.

Dependent variable

The dependent variable in this research is the weight load factor. Company performance is being influenced by exploration and exploitation activities. They affect the company performance differently, hence it is difficult to examine the effectiveness. As mentioned earlier, weight load factor indicates tonne-kilometres performed by airline expressed as a percentage of tonne-kilometres available.

Independent and moderating variables

The main independent variable of this research is the relative amount of exploration versus exploitation in companies' business operations. They are measured annually.

Content analysis was used to search the annual relative amount of explorative operations. The definitions of exploration and exploitation vocabulary by Heyden and Volberda (2011) as well as March (1991) were used. These vocabularies have been utilized in several projects on multilevel managerial antecedents of organizational learning. The vocabularies are demonstrated in tables 7 and 8.

Exploration	**Exploitation**
Explor* NOT explorer*	Exploit*
Search*NOT ((search* (engine* OR technolog* OR tool* OR and rescue* OR results)) OR ((web OR job OR online OR internet) search*)	Refin* NOT refiner*
Variation*	Choise*
Risk*	Production*
Experiment*	Efficien*
Play* NOT (((music* OR media* OR dvd* OR mp3* OR video*) play*) OR (play* (station* OR off* OR down* OR field* OR a)) OR player* OR playstation* OR playskool*)	Select*
Flexib*	Implement*
Discover*	Execut* NOT executive*
Innovat*	

Table 7, Vocabulary of March (1991)

Exploration		**Exploitation**	
Explor*	Develop*	Exploit*	Increment*
Search*	Discontin*	Refine*	Continu*
Variation*	Distan*	Choice*	Control*
Autonom*	Distant_Search*	Standard*	Correct*
Experiment*	Diversif*	Efficien*	React*
Play*	Dynamic*	Select*	Reduc*
Flexib*	Proactiv*	Implement*	Reliab*
Discover*	Novel*	Execut*	Perfect*
Innovat*	New_client*	Accelerat*	Plan*
Adventur*	New_market*	Formali*	Precis*
Anticipat*	New_partner*	Implement*	Predict
Expan*	New_product*	Improv*	Procedure

Table 8, Vocabulary of Heyden and Volberda (2011)

Control variables

My analysis also included the following control variables: fleet and utilization time. In this study fleet stands for all airplanes in service and available for operation, including leased in but excluding leased out airplanes. Utilization time is average block time flown (in hours and minutes) per airplane per day.

Data collected

The data was collected from 42 airline companies' annual reports. The collection resulted 420 annual reports, containing 230 megabytes of textual data. 30 airline companies of 42 companies were IATA members and had their annual information reported in IATA documents. I searched the following data from IATA to increase the data to explore the airline companies: weight load factor, fleet, utilization time, and country and continent of origin.

The documented text was analyzed by data analysis and statistical software Stata. The numbers of exploratory and exploitative words in the documents as well as the name of the airline company are calculated for each company year.

Results

After inspecting descriptive statistics, which are available upon request from the authors, I set out to run the system GMM regression models. The results from the system regression models appear in table 9. Model 1 reports the regression with only the control variables. Model 2 reports the full model. Hypotheses 1 predicted that exploration strategies have a positive impact on airline performance. Hypotheses 2 predicted that exploitation strategies have a positive impact on airline performance.

Since the Chi-squared test statistic is 90.88 with 10 degrees of freedom, it is quite the clear the model itself holds. In addition, the lag operator "L1." is statistically significant in both models (p-values 0.001 and <0.001 respectively). This means that a previous element in these time series can be expressed (on average) as a product of a realization of the dependent variable and the coefficient of the lag operator.

As we can see from table 9, the only predictor and control variable fleet is statistically significant at 5% risk level (p-value is 0.008). For Model 2 neither the control variables nor moderating variables explore_mar or exploite_mar are statistically significant at 5% risk level.

Independent variable	**Model 1**			**Model 2**		
	Coeff.	S.E.	p-value	Coeff.	S.E.	p-value
L1.	0,55266	0,1628978	0,001	0,7682149	0,2031243	<0,001
fleet	-0,01875	0,007029	0,008	0,0017294	0,010132	0,864
av_utiliz~s	-1,23903	0,713054	0,082	-1,633922	0,865667	0,059
continent	-1,27184	0,958046	0,184	-3,55771	2,083661	0,088
exploite_mar	-	-	-	0,082111	0,211027	0,697
explore_mar	-	-	-	-0,48177	0,312967	0,124

Table 9, GMM estimation of relative exploration and company performance.

Taking the findings into account, neither the exploration nor exploitation strategies seem to have positive impact on airline performance. In fact, the data do not support the assumption that there is an impact at all at 5% risk level.

Therefore, both hypotheses,
Hypothesis 1: Exploration strategies have a positive impact on airline performance
Hypothesis 2: Exploitation strategies have a positive impact on airline performance, will be rejected.

However, as mentioned above, the variable “fleet” had statistically significant impact on the dependent variable at 5% risk level (coeff. = -0.019, p=0.008). It can be concluded then that the bigger the fleet of planes the smaller the weight load factor on average. However, the relationship between the size of the fleet and the dependent variable can be, for example, quadratic or even cubic. In practice this means that there can one or several optimal sizes for the fleet of planes.

Other results

Along with researching the hypotheses 1 and 2 as a content analysis by Stata, I also analyzed the excel-file, where I collected the data from the yearly Air Transport Statistics published by IATA. The data collected was weight load factor, fleet, utilization time and country. All this information was collected per year per airline per indicator in question. The hits from the words of annual reports are also listed compared to the exploitation and exploration vocabularies accordingly. Two tables are shown below: the first table demonstrates the top 13 airline annual reports, which have the highest amount of hits of the exploitation vocabularies. The latter table then demonstrates the top 13 airline annual reports, which have the highest amount of hits of the exploration vocabularies.

The two highest numbers of hits of vocabularies, weight load factors, fleet as well as utilization times are shown in red and bolded font.

Airline	Exploitation vocabulary H&V	Exploitation vocabulary M	Words	Weight load factor %	Fleet	Utiliz. Time	Country
SAS 2001	447	**101**	66064	69,4	**190**	7,3	Denmark, Norway, Sweden
Iberia 2001	525	**88**	66719	48,4	144	N/A	Spain
China Southern Air 1997	**605**	85	164330	52,7	91	7,7	China
SAS 1999	379	77	53947	68,8	181	7,7	Denmark, Norway, Sweden
Iberia 1998	401	76	49578	53,9	112	6,9	Spain
SAS 1997	312	64	51172	60,1	164	7,9	Denmark, Norway, Sweden
Iberia 2000	429	63	55093	53,2	159	7,7	Spain
SAS 2000	375	60	57585	69,9	183	7,5	Denmark, Norway, Sweden
American Airlines	**640**	59	89136				USA
All Nippon Airway 2001	345	58	51848	44,7	141	9,7	Japan
British Airways 2000	403	55	31395	70,1	**311**	9,2	United Kingdom
Singapore Airlines 2000	207	23	32578	**73,3**	90	**12,5**	Singapore
Cathay Pacific 2000	94	8	21735	**71,4**	64	**13,1**	Hong Kong SAR (China)

Table 10, Top 13 airline annual reports with highest amount of hits with the exploitation vocabularies.

Airline	Exploration vocabulary H&V	Exploration vocabulary M	Words	Weight load factor %	Fleet	Utiliz. Time	Country
Iberia 2001	173	**155**	66719	48,4	144	N/A	Spain
Iberia 1999	157	**141**	54982	N/A	178	7,2	Spain
Iberia 1998	158	138	49578	53,9	112	6,9	Spain
Iberia 2000	152	137	55093	53,2	159	7,7	Spain
SAS 2001	**216**	82	66064	69,4	190	7,3	Denmark, Norway, Sweden
Lufthansa 2000	170	76	65084	**72,6**	**328**	9,2	Germany
SAS 2000	208	71	57585	69,9	183	7,5	Denmark, Norway, Sweden
Lufthansa 1999	161	65	57875	70,2	**303**	9,2	Germany
China Southern Air 1997	**215**	64	164330	52,7	91	7,7	China
SAS 1999	209	60	53947	68,8	181	7,7	Denmark, Norway, Sweden
Lufthansa 1998	101	52	49146	68,9	295	9,2	Germany
Cathay Pacific 2000	23	8	21735	71,4	64	**13,1**	Hong Kong SAR (China)
Singapore Airlines 2000	45	4	32578	**73,3**	90	**12,5**	Singapore

Table 11, Top 13 airline annual reports with highest amount of hits with the exploration vocabularies.

The vocabulary hits

The highest hits in both categories (exploitation and exploration) are interesting, because there are two vocabularies in each category: the vocabularies of March as well as vocabularies of Heyden and Volberda. The both vocabularies are demonstrated in tables 6 and 7. The interesting fact about the vocabulary hits is, that in both tables, the same annual reports are not in the top hits category by both vocabularies. Both vocabularies are in the top level, but not at the same level anyway. This indicates to me, that there are certain differences between the vocabulariy of Heyden and Volberda and the vocabulary of March.

Weight load factor

In both tables Singapore Airlines year's 2000 annual report had the highest weight load factor percent, which is 73,3, The second highest was in exploitation table Cathay Pacific's year 2000 annual report and in exploration table Lufthansa's year 2000 annual report. The high rating of Singapore Airlines and Cathay Pacific could be explained by the quality excellence the both airlines are implementing towards the passengers. The large Asian airline companies have achieved the reputation of the upscale customer service with the classy and graceful Asian hospitality attitude.

Both airlines are also established hub-and-spoke airlines, and as Mirza (2008) reviewed, that even they have longer turn-times, hub-and-spoke carriers tend to have higher passenger load factors. Also airlines which have participated in alliance have gained from the alliance membership in terms of load factors and general rise in productivity levels (Morrish and Hamilton, 2002). Singapore Airlines is a member of Star Alliance as Cathay Pacific is a One World alliance member.

Fleet

As mentioned earlier, in this study the fleet stands for all airplanes in service and available for operation, including leased in but excluding leased out airplanes. The largest fleet in exploitation table was indicated to British Airways' year 2000 annual report (311 aircraft) as the second largest fleet indicates to SAS year 2001 report (190 aircraft). The exploration table shows that the largest fleet was indicated to annual report of year 2000 and 1999 of Lufthansa (328 and 303). These are all large or medium large airlines within global standards, particularly in European perspective.

According Delfmann et al. (2005) a large part of complexity involved in traditional airline processes is driven by the complexity of the aircraft fleets. The large fleet size of British

Airways, Lufthansa and SAS can be explained by theory, which implies that a central continental hub results in flights to more remote airports. Therefore the company's aircraft range is an important issue especially for routes with limited demand (Delfmann et al. 2005). In terms of British Airways, Lufthansa and SAS that is surely one reason for the fleet size, derived from broad destination network around Central and Northern Europe inclusive also several remote and small destinations. That is also most definitely an operation mode left from the time before deregulation, when the flag carrier airlines were owned and financed by the governments.

Utilization time

The average utilization time of the aircraft indicated the highest numbers in both tables for Cathay Pacific and Singapore Airlines' annual reports of year 2000. The utilization times were considerably higher than in any other (European) companies. The highest utilization time of Cathay Pacific's year 2000 (13.1 hours) was almost twice as large as the Iberia 1998 number 6.9 hours.

As Thomas Lawton (2003) argues, the nature and strategic objectives of an airline also determine the productivity and cost differ. Consequently short-haul carriers have higher aircraft utilization and bigger yields than long-haul carriers. This is interesting fact, because both Singapore Airlines and Cathay Pacific are also significant operators in long-haul traffic. According Mirza (2009) airplane availability (in terms of number of trips) is quite sensitive to average turn-time for shorter average trip lengths.

Country/continent

The airlines which had remarkably highest utilization times and load factors were both from Asia. Singapore Airlines is from Singapore, whereas Cathay Pacific is based on Hong Kong. Intriguingly, Heracleous et al. (2004) have studied Singapore Airlines and the cost-effective service excellence the company is practicing: since Michael Porter's influential

suggestions that differentiation and cost leadership are mutually exclusive strategies, and whether a combined strategy can achieved, Singapore Airlines proofed with its actions that that is possible. However, almost all other airline companies in both tables are large European flag carrier airlines. The only exceptions are China Southern Airline's year 1997 and All Nippon Airways' 2001. The assumption for this paradigm is the language and idioms used in corporate communication, which is common and widespread in Western a.k.a European business culture. Since the results did not support hypotheses 1 or hypotheses 2, I argue, that the reason these European airlines are in a top 13 with exploration and exploitation vocabulary hits is the corporate language with it's phrases and idioms similar to the vocabularies in this research.

Exploration and exploitation functions in airlines

As mentioned earlier, according March (1991), exploration strategy comprises primarily search, variation, risk-taking, experimentation, play, flexibility, discovery and innovation. Whereas exploitation strategy can be defined as in terms of refinement, choice, production, efficiency, selection, implementation and execution.

The findings among this study are following: March's defined exploration strategy functions are mainly being operated by low-cost airlines. They are executing variation by creating new products (low-cost, no-frills), risk-taking by creating new business models different from traditional airline business models, experimentation and play by thinking air travelling out of the box, flexibility and discovery by selling inbound tickets with the same price whether the customer is taking one way or round trip ticket as well as innovation by maximizing the ticket sale from own online reservation systems and abandoning the diverse fleet by operating with the same type of aircraft.

On the contrary, I found that March's exploitation strategies are mostly being implemented by traditional hub-and-spoke, also described as flag carriers. They are executing refinement by nurturing the brand image of a high-class airline, choice, production and selection by

maintaining broad destination repertory, efficiency by having multiple sales channels along with own online channels as well as implementation and execution by having various products and aircrafts.

Discussion and conclusion

The aim of this research was to clarify, how airlines balance their exploration and exploitation activities. The research did not support the hypotheses. The main reason why I did not get positive results from this research was the diverse nature of airline industry and the economical problems due to airline deregulation and price sensitivity. The airlines can't focus properly on either explorative or exploitative operations. The competition in the market is so severe and price war is forcing airlines to exercise both strategies, but not concentrate properly on either of them. However the results from the system regression models showed that it can be concluded that the bigger the fleet of planes the smaller the weight load factor on average.

According Lawton (2003) in the airline business, the contest to lower costs, increase profitability and gain market advantage is often accompanied by price-based competition. However, he continues that there is room for both business models to survive and prosper, but it seems, that efficient low-cost airlines are the role models for future profitability and growth in the industry. In order to maintain or develop a successful market position is willingness to make hard choices and strategic trade-offs (Porter, 1996).

The essential feature of a reliable airline product are on-line departures and arrivals, low cancellation rates, minimal lost or damaged baggage and helpful, informed and available customer service staff (Lawton, 2003).

The low-cost airlines have made an enormous impact on aviation industry during previous decade. Since the deregulation in US and Europe, the open skies have caused severe

competition in aviation industry. The new business models and operation modes as well as cost structures have changed the aviation business altogether. According Peter Morrell (2005) the head to head competition with low-cost airlines is however not advisable, even though the low-cost business model has been commonly more profitable than the established flag carrier model. As Graf (2005) illustrates in his paper "Incompatibilities of the low-cost and network carrier business models within the same airline grouping" attempts of network carriers to form low-cost offshoot: transferring de-centralized traffic flows to the low-cost unit and deploying the aircraft of the network carrier merely to hub operations could be an efficient work-sharing and positioning strategy for the business units. If airlines practice organizational ambidexterity, my conclusion is that they should be aware for not pursuit cyclical ambidexterity (de Kloet, 2012): instead of only pursuing exploitation and exploration within one unit with the same group of people (cyclical), it might be necessary to work across unit or even organization borders in order to achieve specific objective(s).

As, Lavie et al. (2010) suggest, that exploration-exploitation should not be viewed as continuum, but instead as an option between separate alternatives, the conclusions are supporting this theory. Several different actions can be chosen to pursuit organizational ambidexterity, the long-term and persistent operations are the profitable ones when they fit well in the business plan of the company. According Kauppila's (2007) proposition 6 of network model of ambidexterity exploitative processes ultimately strengthen explorative processes and are essential for their survival. Explorative processes do not have a similar effect on the survival of exploitative processes because explicit knowledge is always available in the market. This paradigm is essential for executives in aviation industry as well. The availability of explicit knowledge should be considered when planning personnel operations.

This paper has illustrated how the annual reports and the language used in them does clarify us, that exploration or exploitation strategies do not have a positive impact on airline performance. However as several researchers have studied annual reports, some attitudes are quite skeptical. According Courtis (2002), disclosures in annual reports are weakly associated with other measures of performance. "All studies using the letter for shareholders contained in

annual corporate reports have a common limitation. Researchers do not know the authors of these documents and do not know much about the conditions under which they were written (Fiol, 1995, p. 532)."

When researching the vocabulary hits from the excel files filled with information from the yearly IATA reports, the large Asian airline companies (mainly Singapore Airlines and Cathay Pacific) had highest position regarding utilization time and weight load factor. The achieved reputation of the upscale customer service with the classy and graceful Asian hospitality attitude as well as broad destination network and in addition long-haul flights is most probably the reason. Large European established carriers British Airways, SAS and Lufthansa were in top position regarding the fleet size. The broad destination networks of these flag carrier hub-and-spoke airlines is an essential reason for the ranking.

To conclude, in this research I reviewed two factors that could have a positive impact on airline performance. However, the research did not support the hypotheses. Looking at the European airline industry after deregulation, the aviation companies are facing enormous challenges due to fierce competition and the strategies of airline companies are flexible and in constant change. In addition, peoples' travelling habits and frequencies are constantly growing respectively. It is therefore important to continue to analyse the management strategies within airline companies, for example demand analysis, associated with income, own-price and cross-price elasticities has useful managerial implications for travel service providers (Graham et al., 2010). The cult of cost reduction has become a powerful operating model in airline industry's business models. Nevertheless the results from this research show that it may not be so fruitful model as it has been generally considered within the aviation industry. "Rather than determining what are the right products and services to give to the right customers at the right costs which may be more than current average costs, a repetitive swathe is cut through costs. This is done without too much depth of thought because cost cutting has become a cult. Rather than cost being one lever to pull, it is the end game" (http://www.changefactory.com.au/our-thinking/articles/the-cult-of-cost-cutting/).

Future research

The research studied airlines and their annual reports under years 1996-2001. Until year 2001 there was not yet many low cost airline companies operating. Future research could focus on searching organizational ambidexterity more explicitly between low cost airlines and full service airlines. Another perspective, not dealt within this study, is to find out do results of customer satisfaction surveys of airline companies and the hits of exploration and exploitation vocabularies have any significant correspondence.

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Appendix 1

Stata output

```
Airlines Wednesday March 6 10:22:21 2013 Page 1
___ ____ ____ ____ ____(R)
/__ / ____/ / ____/
___/ / /___/ / /___/
Statistics/Data Analysis
User: cognition
___ ____ ____ ____ ____ (R)
/__ / ____/ / ____/
___/ / /___/ / /___/ 11.0 Copyright 1984-2009
Statistics/Data Analysis StataCorp
4905 Lakeway Drive
Special Edition College Station, Texas 77845 USA
800-STATA-PC http://www.stata.com
979-696-4600 stata@stata.com
979-696-4601 (fax)
Single-user Stata license expires 31 Dec 9999:
Serial number: 71606281563
Licensed to: STATAForAll
STATA
Notes:
1. (/m# option or -set memory-) 50.00 MB allocated to data
2. (/v# option or -set maxvar-) 5000 maximum variables
running C:\Users\syrigos\Documents\syrigos\Stata\profile.do ...
1 . use
"C:\Users\syrigos\Downloads\airlines_iata_information_years_continents1.d
> ta", clear
2 . xtset col1 year
panel variable: col1 (unbalanced)
time variable: year, 1996 to 2001, but with gaps
delta: 1 unit
3 .
4 . tab year, generate (year_)
year Freq. Percent Cum.
1996 7 5.15 5.15
1997 21 15.44 20.59
1998 26 19.12 39.71
1999 26 19.12 58.82
2000 28 20.59 79.41
2001 28 20.59 100.00
Total 136 100.00
5 . xtabond2 weight_load_factor__ L.weight_load_factor__ fleet
av__utiliz__time_f
> or_aircrafts continent year_1 year_2 year_3 year_4 year_5 year_6 expl_vol
exp
> loit_vol, gmmstyle(L.weight_load_factor__) ivstyle( year continent
av__utiliz
> __time_for_aircrafts fleet)
Favoring speed over space. To switch, type or click on mata: mata set mata-
favor
> space, perm.
year_1 dropped due to collinearity
year_6 dropped due to collinearity
Dynamic panel-data estimation, one-step system GMM
Group variable: col1 Number of obs = 92
Time variable : year Number of groups = 28
Number of instruments = 19 Obs per group: min = 1
Wald chi2(10) = 114.97 avg = 3.29
Prob > chi2 = 0.000 max = 5
weight_loa~_ Coef. Std. Err. z P>|z| [95% Conf. Interval]
weight_loa~_
L1. .5526664 .1628978 3.39 0.001 .2333927 .8719401
fleet -.0187486 .0070294 -2.67 0.008 -.032526 -.0049712
av__utiliz~s -1.239026 .7130544 -1.74 0.082 -2.636587 .1585354
continent -1.271837 .9580458 -1.33 0.184 -3.149572 .6058981
year_2 4.213358 3.285989 1.28 0.200 -2.227063 10.65378
```

```
year_3 2.816501 2.4636 1.14 0.253 -2.012067 7.645069
year_4 6.010404 2.537353 2.37 0.018 1.037284 10.98352
year_5 6.737987 2.180072 3.09 0.002 2.465125 11.01085
Airlines Wednesday March 6 10:22:21 2013 Page 2
expl_vol -.0687063 .0703988 -0.98 0.329 -.2066855 .0692728
exploit_vol .0325194 .0257307 1.26 0.206 -.017912 .0829507
_cons 37.50413 12.64089 2.97 0.003 12.72844 62.27982
Instruments for first differences equation
Standard
D.(year continent av__utiliz__time_for_aircrafts fleet)
GMM-type (missing=0, separate instruments for each period unless collapsed)
L(1/5).L.weight_load_factor__
Instruments for levels equation
Standard
year continent av__utiliz__time_for_aircrafts fleet
_cons
GMM-type (missing=0, separate instruments for each period unless collapsed)
D.L.weight_load_factor__
Arellano-Bond test for AR(1) in first differences: z = -3.72 Pr > z = 0.000
Arellano-Bond test for AR(2) in first differences: z = 1.36 Pr > z = 0.173
Sargan test of overid. restrictions: chi2(8) = 9.15 Prob > chi2 = 0.330
(Not robust, but not weakened by many instruments.)
Difference-in-Sargan tests of exogeneity of instrument subsets:
GMM instruments for levels
Sargan test excluding group: chi2(4) = 4.54 Prob > chi2 = 0.337
Difference (null H = exogenous): chi2(4) = 4.61 Prob > chi2 = 0.330
iv(year continent av__utiliz__time_for_aircrafts fleet)
Sargan test excluding group: chi2(4) = 5.05 Prob > chi2 = 0.282
Difference (null H = exogenous): chi2(4) = 4.11 Prob > chi2 = 0.392
6 . xtabond2 weight_load_factor__ L.weight_load_factor__ fleet
av__utiliz__time_f
> or_aircrafts continent year_1 year_2 year_3 year_4 year_5 year_6 ex-
ploite_mar> t explore_mar, gmmstyle(L.weight_load_factor__) ivstyle( year
continent av__u
> tiliz__time_for_aircrafts fleet)
Favoring speed over space. To switch, type or click on mata: mata set mata-
favor
> space, perm.
year_1 dropped due to collinearity
year_6 dropped due to collinearity
Dynamic panel-data estimation, one-step system GMM
Group variable: col1 Number of obs = 90
Time variable : year Number of groups = 27
Number of instruments = 19 Obs per group: min = 1
Wald chi2(10) = 90.88 avg = 3.33
Prob > chi2 = 0.000 max = 5
weight_loa~_ Coef. Std. Err. z P>|z| [95% Conf. Interval]
weight_loa~_
L1. .7682149 .2031243 3.78 0.000 .3700986 1.166331
fleet .0017294 .0101323 0.17 0.864 -.0181296 .0215884
av__utiliz~s -1.633922 .865667 -1.89 0.059 -3.330598 .0627539
continent -3.55771 2.083661 -1.71 0.088 -7.64161 .5261908
year_2 -3.573655 4.57096 -0.78 0.434 -12.53257 5.385262
year_3 -5.395419 4.386894 -1.23 0.219 -13.99357 3.202734
year_4 -1.662688 3.821827 -0.44 0.664 -9.15333 5.827955
year_5 .4439674 3.383174 0.13 0.896 -6.186932 7.074867
exploite_mar .082111 .2110266 0.39 0.697 -.3314935 .4957155
explore_mar -.4817702 .3129674 -1.54 0.124 -1.095175 .1316348
_cons 47.35962 15.53034 3.05 0.002 16.92071 77.79854
Instruments for first differences equation
Standard
D.(year continent av__utiliz__time_for_aircrafts fleet)
GMM-type (missing=0, separate instruments for each period unless collapsed)
L(1/5).L.weight_load_factor__
Instruments for levels equation
Standard
year continent av__utiliz__time_for_aircrafts fleet
_cons
Airlines Wednesday March 6 10:22:21 2013 Page 3
GMM-type (missing=0, separate instruments for each period unless collapsed)
D.L.weight_load_factor__
Arellano-Bond test for AR(1) in first differences: z = -2.99 Pr > z = 0.003
```

```
Arellano-Bond test for AR(2) in first differences: z = 1.47 Pr > z = 0.143
Sargan test of overid. restrictions: chi2(8) = 7.38 Prob > chi2 = 0.496
(Not robust, but not weakened by many instruments.)
Difference-in-Sargan tests of exogeneity of instrument subsets:
GMM instruments for levels
Sargan test excluding group: chi2(4) = 3.13 Prob > chi2 = 0.536
Difference (null H = exogenous): chi2(4) = 4.25 Prob > chi2 = 0.373
iv(year continent av__utiliz__time_for_aircrafts fleet)
Sargan test excluding group: chi2(4) = 3.71 Prob > chi2 = 0.447
Difference (null H = exogenous): chi2(4) = 3.67 Prob > chi2 = 0.452
7 . xtabond2 weight_load_factor__ L.weight_load_factor__ fleet
av__utiliz__time_f
> or_aircrafts continent year_1 year_2 year_3 year_4 year_5 year_6
L.exploite_
> uot L.explore_mar, gmmstyle(L.weight_load_factor__) ivstyle( year conti-
nent a
> v__utiliz__time_for_aircrafts fleet)
Favoring speed over space. To switch, type or click on mata: mata set mata-
favor
> space, perm.
year_1 dropped due to collinearity
year_6 dropped due to collinearity
Dynamic panel-data estimation, one-step system GMM
Group variable: col1 Number of obs = 88
Time variable : year Number of groups = 27
Number of instruments = 19 Obs per group: min = 1
Wald chi2(10) = 140.71 avg = 3.26
Prob > chi2 = 0.000 max = 5
weight_loa~_ Coef. Std. Err. z P>|z| [95% Conf. Interval]
weight_loa~_
L1. .538017 .1230367 4.37 0.000 .2968694 .7791646
fleet -.010507 .0054033 -1.94 0.052 -.0210973 .0000833
av__utiliz~s -1.38756 .7617657 -1.82 0.069 -2.880594 .1054728
continent -1.418086 .9974917 -1.42 0.155 -3.373134 .5369614
year_2 1.788759 2.916494 0.61 0.540 -3.927464 7.504981
year_3 -.3855422 1.987471 -0.19 0.846 -4.280913 3.509829
year_4 3.72903 1.804582 2.07 0.039 .1921137 7.265946
year_5 4.940066 1.59146 3.10 0.002 1.820862 8.059271
exploite_uot
L1. .0713137 .2172109 0.33 0.743 -.3544118 .4970392
explore_uot
L1. -.1499781 .2077034 -0.72 0.470 -.5570692 .257113
_cons 45.229 17.06799 2.65 0.008 11.77637 78.68164
Instruments for first differences equation
Standard
D.(year continent av__utiliz__time_for_aircrafts fleet)
GMM-type (missing=0, separate instruments for each period unless collapsed)
L(1/5).L.weight_load_factor__
Instruments for levels equation
Standard
year continent av__utiliz__time_for_aircrafts fleet
_cons
GMM-type (missing=0, separate instruments for each period unless collapsed)
D.L.weight_load_factor__
Arellano-Bond test for AR(1) in first differences: z = -3.30 Pr > z = 0.001
Arellano-Bond test for AR(2) in first differences: z = 0.07 Pr > z = 0.946
Sargan test of overid. restrictions: chi2(8) = 10.84 Prob > chi2 = 0.211
(Not robust, but not weakened by many instruments.)
Airlines Wednesday March 6 10:22:21 2013 Page 4
Difference-in-Sargan tests of exogeneity of instrument subsets:
GMM instruments for levels
Sargan test excluding group: chi2(4) = 6.10 Prob > chi2 = 0.192
Difference (null H = exogenous): chi2(4) = 4.74 Prob > chi2 = 0.315
iv(year continent av__utiliz__time_for_aircrafts fleet)
Sargan test excluding group: chi2(4) = 4.02 Prob > chi2 = 0.403
Difference (null H = exogenous): chi2(4) = 6.82 Prob > chi2 = 0.146
8 . xtabond2 weight_load_factor__ L.weight_load_factor__ fleet
av__utiliz__time_f
> or_aircrafts continent year_1 year_2 year_3 year_4 year_5 year_6
L.exploite_
> mar L.explore_mar explore_uot exploite_mar, gmm-
style(L.weight_load_factor__)
```

```
> ivstyle( year continent av__utiliz__time_for_aircrafts fleet)
Favoring speed over space. To switch, type or click on mata: mata set mata-
favor
> space, perm.
year_1 dropped due to collinearity
year_6 dropped due to collinearity
Dynamic panel-data estimation, one-step system GMM
Group variable: col1 Number of obs = 87
Time variable : year Number of groups = 27
Number of instruments = 19 Obs per group: min = 1
Wald chi2(12) = 46.54 avg = 3.22
Prob > chi2 = 0.000 max = 5
weight_loa~_ Coef. Std. Err. z P>|z| [95% Conf. Interval]
weight_loa~_
L1. .9787581 .4147691 2.36 0.018 .1658257 1.791691
fleet .0074156 .0178993 0.41 0.679 -.0276664 .0424976
av__utiliz~s -2.046445 2.256324 -0.91 0.364 -6.468759 2.375869
continent -5.671982 4.131762 -1.37 0.170 -13.77009 2.426123
year_2 -5.670493 8.261503 -0.69 0.492 -21.86274 10.52176
year_3 -11.00508 9.435678 -1.17 0.243 -29.49867 7.488508
year_4 -6.984231 9.150929 -0.76 0.445 -24.91972 10.95126
year_5 -3.656274 7.560219 -0.48 0.629 -18.47403 11.16148
exploite_uot
L1. -.1226954 .5085961 -0.24 0.809 -1.119525 .8741346
explore_mar
L1. .4779752 .615247 0.78 0.437 -.7278867 1.683837
--. -.9879559 .7984167 -1.24 0.216 -2.552824 .5769122
exploite_mar .0634673 .3950532 0.16 0.872 -.7108227 .8377572
_cons 51.26773 40.39558 1.27 0.204 -27.90615 130.4416
Instruments for first differences equation
Standard
D.(year continent av__utiliz__time_for_aircrafts fleet)
GMM-type (missing=0, separate instruments for each period unless collapsed)
L(1/5).L.weight_load_factor__
Instruments for levels equation
Standard
year continent av__utiliz__time_for_aircrafts fleet
_cons
GMM-type (missing=0, separate instruments for each period unless collapsed)
D.L.weight_load_factor__
Arellano-Bond test for AR(1) in first differences: z = -1.65 Pr > z = 0.098
Arellano-Bond test for AR(2) in first differences: z = 0.87 Pr > z = 0.386
Sargan test of overid. restrictions: chi2(6) = 2.13 Prob > chi2 = 0.908
(Not robust, but not weakened by many instruments.)
Airlines Wednesday March 6 10:22:22 2013 Page 5
Difference-in-Sargan tests of exogeneity of instrument subsets:
GMM instruments for levels
Sargan test excluding group: chi2(2) = 0.34 Prob > chi2 = 0.844
Difference (null H = exogenous): chi2(4) = 1.79 Prob > chi2 = 0.775
iv(year continent av__utiliz__time_for_aircrafts fleet)
Sargan test excluding group: chi2(2) = 0.45 Prob > chi2 = 0.798
Difference (null H = exogenous): chi2(4) = 1.67 Prob > chi2 = 0.795
9 . generate amb_vol = expl_vol* exploit_vol
10 . generate amb_uot = explore_uot* exploite_uot
(6 missing values generated)
11 . xtabond2 weight_load_factor__ L.weight_load_factor__ fleet
av__utiliz__time_f
> or_aircrafts continent year_1 year_2 year_3 year_4 year_5 year_6 amb_vol
L.am
> b_vol, gmmstyle(L.weight_load_factor__) ivstyle( year continent
av__utiliz__t
> ime_for_aircrafts fleet)
Favoring speed over space. To switch, type or click on mata: mata set mata-
favor
> space, perm.
year_1 dropped due to collinearity
year_6 dropped due to collinearity
Dynamic panel-data estimation, one-step system GMM
Group variable: col1 Number of obs = 92
Time variable : year Number of groups = 28
Number of instruments = 19 Obs per group: min = 1
Wald chi2(10) = 123.65 avg = 3.29
```

```
Prob > chi2 = 0.000 max = 5
weight_loa~_ Coef. Std. Err. z P>|z| [95% Conf. Interval]
weight_loa~_
L1. .6101661 .1450452 4.21 0.000 .3258827 .8944494
fleet -.0112927 .0042761 -2.64 0.008 -.0196736 -.0029117
av__utiliz~s -2.070882 .792873 -2.61 0.009 -3.624884 -.5168791
continent -1.401625 .9696756 -1.45 0.148 -3.302155 .498904
year_2 1.862067 2.660459 0.70 0.484 -3.352337 7.07647
year_3 -.2954596 2.023853 -0.15 0.884 -4.262139 3.67122
year_4 3.331518 1.769294 1.88 0.060 -.1362342 6.799269
year_5 4.902018 1.709981 2.87 0.004 1.550518 8.253519
amb_vol
--. -.0001411 .0002088 -0.68 0.499 -.0005503 .0002681
L1. -.0001468 .0001365 -1.08 0.282 -.0004143 .0001207
_cons 50.22567 13.67893 3.67 0.000 23.41545 77.03588
Instruments for first differences equation
Standard
D.(year continent av__utiliz__time_for_aircrafts fleet)
GMM-type (missing=0, separate instruments for each period unless collapsed)
L(1/5).L.weight_load_factor__
Instruments for levels equation
Standard
year continent av__utiliz__time_for_aircrafts fleet
_cons
GMM-type (missing=0, separate instruments for each period unless collapsed)
D.L.weight_load_factor__
Arellano-Bond test for AR(1) in first differences: z = -2.92 Pr > z = 0.003
Arellano-Bond test for AR(2) in first differences: z = 1.11 Pr > z = 0.268
Sargan test of overid. restrictions: chi2(8) = 9.44 Prob > chi2 = 0.307
(Not robust, but not weakened by many instruments.)
Airlines Wednesday March 6 10:22:22 2013 Page 6
Difference-in-Sargan tests of exogeneity of instrument subsets:
GMM instruments for levels
Sargan test excluding group: chi2(4) = 7.96 Prob > chi2 = 0.093
Difference (null H = exogenous): chi2(4) = 1.49 Prob > chi2 = 0.829
iv(year continent av__utiliz__time_for_aircrafts fleet)
Sargan test excluding group: chi2(4) = 6.42 Prob > chi2 = 0.170
Difference (null H = exogenous): chi2(4) = 3.02 Prob > chi2 = 0.555
12 . xtabond2 weight_load_factor__ L.weight_load_factor__ fleet
av__utiliz__time_f
> or_aircrafts continent year_1 year_2 year_3 year_4 year_5 year_6 amb_uot
L.a
> mb_uot, gmmstyle(L.weight_load_factor__) ivstyle( year continent
av__utiliz__
> time_for_aircrafts fleet)
Favoring speed over space. To switch, type or click on mata: mata set mata-
favor
> space, perm.
year_1 dropped due to collinearity
year_6 dropped due to collinearity
Dynamic panel-data estimation, one-step system GMM
Group variable: col1 Number of obs = 87
Time variable : year Number of groups = 27
Number of instruments = 19 Obs per group: min = 1
Wald chi2(10) = 99.03 avg = 3.22
Prob > chi2 = 0.000 max = 5
weight_loa~_ Coef. Std. Err. z P>|z| [95% Conf. Interval]
weight_loa~_
L1. .659445 .1643496 4.01 0.000 .3373257 .9815642
fleet -.0109628 .0044197 -2.48 0.013 -.0196253 -.0023003
av__utiliz~s -2.702407 1.063613 -2.54 0.011 -4.787051 -.6177634
continent -3.265851 1.670404 -1.96 0.051 -6.539782 .0080803
year_2 -.0301638 3.534564 -0.01 0.993 -6.957782 6.897455
year_3 -3.605475 3.108144 -1.16 0.246 -9.697325 2.486375
year_4 2.012066 2.309188 0.87 0.384 -2.51386 6.537992
year_5 3.812325 2.113626 1.80 0.071 -.3303053 7.954955
amb_uot
--. -.0046759 .0037132 -1.26 0.208 -.0119537 .0026018
L1. -.0021516 .0032503 -0.66 0.508 -.0085221 .0042189
_cons 60.21832 17.24956 3.49 0.000 26.4098 94.02684
Instruments for first differences equation
Standard
```

```
D.(year continent av__utiliz__time_for_aircrafts fleet)
GMM-type (missing=0, separate instruments for each period unless collapsed)
L(1/5).L.weight_load_factor__
Instruments for levels equation
Standard
year continent av__utiliz__time_for_aircrafts fleet
_cons
GMM-type (missing=0, separate instruments for each period unless collapsed)
D.L.weight_load_factor__
Arellano-Bond test for AR(1) in first differences: z = -2.27 Pr > z = 0.023
Arellano-Bond test for AR(2) in first differences: z = 0.69 Pr > z = 0.493
Sargan test of overid. restrictions: chi2(8) = 5.45 Prob > chi2 = 0.708
(Not robust, but not weakened by many instruments.)
Difference-in-Sargan tests of exogeneity of instrument subsets:
GMM instruments for levels
Sargan test excluding group: chi2(4) = 4.99 Prob > chi2 = 0.288
Difference (null H = exogenous): chi2(4) = 0.46 Prob > chi2 = 0.977
iv(year continent av__utiliz__time_for_aircrafts fleet)
Sargan test excluding group: chi2(4) = 4.37 Prob > chi2 = 0.358
Difference (null H = exogenous): chi2(4) = 1.08 Prob > chi2 = 0.898
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13 . save
"C:\Users\syrigos\Downloads\airlines_iata_information_years_continents1.
> dta", replace
file
C:\Users\syrigos\Downloads\airlines_iata_information_years_continents1.dta
> saved
14 .
```

Appendix 2

Data set excel files

Row Labels	expl_vol	exploit_vol	exploite_ mar	explore_mar	Words	Weight load factor %	Fleet	Av. Utiliz. Time for aircrafts	Country
AerLingus1997.txt	37	115	10	1	6492	69,5	32	8	Ireland
AerLingus1998.txt	13	39	5	3	7234	75,8	34	8	Ireland
AerLingus1999.txt	42	146	17	3	14197	N/A	N/A	N/A	Ireland
AerLingus2000.txt	28	110	15	3	12647	N/A	N/A	N/A	Ireland
AerLingus2001.txt	10	160	28	7	12681				
AerLingus2002.txt	17	182	20	13	12727				
AerLingus2003.txt	11	117	9	10	11273				
AerLingus2004.txt	13	122	15	11	11495				
AerLingus2005.txt	15	149	21	25	12177				
AerLingus2006.txt	54	402	46	95	34037				
AirCanada1996.txt	59	230	16	19	21679	58	136	9,6	Canada
AirCanada1997.txt	60	299	23	29	27970	56,2	156	9,1	Canada
AirCanada1998.txt	58	268	16	27	29092	54,6	157	9,6	Canada
AirCanada1999.txt	50	260	20	19	29352	52,1	157	12	Canada
AirCanada2000.txt	55	304	25	22	39956	54,5	174	8,9	Canada
AirCanada2001.txt	38	385	12	22	42933	53,1	254	9,1	Canada
AirCanada2002.txt	19	298	2	21	29183				
AirCanada2003.txt	46	476	26	38	45123				
AirCanada2004.txt	75	591	69	52	65492				
AirCanada2005.txt	60	630	67	65	68676				
AirCanada2006.txt	41	577	38	75	57177				
airfr1998.txt	7	4		9	7066	69,6	203	9,9	France
airfr1999.txt	72	160	26	34	27708	63	214	9,9	France
airfr1999_Broken.txt	15	15	4	4	5369				
airfr2000.txt	25	174	22	21	34100	61,8	230	10,1	France
airfr2001.txt	47	163	28	35	34795	68,7	367	N/A	France
airfr2002.txt	48	194	25	42	34545				
airfr2003.txt	71	197	21	63	37802				
airfr2003csr.txt	61	247	38	7	23262				
airfr2004.txt	208	579	88	107	66943				
airfr2005.txt	167	699	93	170	81491				
airfr2006.txt	195	798	107	183	85759				
airfr2006csr.txt	178	483	111	52	24913				
AirNewZealand1996.txt	31	101	9	8	19497	66,9	33	11,7	New Zea-land
AirNewZealand1997(1).txt	52	134	15	7	19130	N/A	31	11,8	New Zea-land

AirNewZealand1998(1).txt	27	117	9	8	18559	68,2	35	12,4	New Zea-land
AirNewZealand1999.txt	29	153	12	9	19736	68,5	38	12,3	New Zea-land
AirNewZealand2000.txt	17	128	9	9	22558	80,5	84	9,8	New Zea-land
AirNewZealand2001.txt	21	180	14	24	25730	65,3	89	9,1	New Zea-land
AirNewZealand2002.txt	25	212	7	22	38500				
AirNewZealand2003.txt	42	303	24	56	38472				
AirNewZealand2004.txt	54	369	39	56	40876				
AirNewZealand2005.txt	85	410	41	64	45072				
AirNewZealand2006.txt	27	80	9	8	11554				
AirNewZealand2006earn(1).txt	1	30			3190				
AirNewZealand2006stat.txt	20	147	9	22	20437				
AirNewZealand2007.txt	34	130	26	11	9644				
airtran1999.txt	20	153	13	26	17360				
airtran2000.txt	12	90	3	15	13229				
airtran2001.txt	24	148	7	13	19513				
airtran2002.txt	21	172	7	18	21772				
airtran2003.txt	17	168	8	14	22456				
airtran2004.txt	16	178	10	18	20772				
airtran2005.txt	62	532	40	57	70222				
airtran2006.txt	82	376	33	70	43492				
alaskaair1996(1).txt	9	161	16	6	14184	46,8	74	11,2	USA
alaskaair1997.txt	5	119	6	6	13763	48	78	11,8	USA
alaskaair1998(1).txt	22	147	17	11	14935	46	80	11,8	USA
alaskaair1999(1).txt	30	136	20	15	14595	42,8	89	11,2	USA
alaskaair2000(1).txt	17	188	25	12	17123	44,8	95	10,9	USA
alaskaair2001.txt	23	213	20	22	24020	48,8	102	10,2	USA
alaskaair2002.txt	43	352	24	47	35456				
alaskaair2003.txt	53	433	26	60	40227				
alaskaair2004.txt	42	552	20	58	47333				
alaskaair2005.txt	62	969	39	72	111107				
Alitalia1997.txt	115	305	60	91	41950				
Alitalia1999(1).txt	73	150	40	37	43799	68,9	146	10,1	Italy
Alitalia2000.txt	47	167	44	29	38712	74,4	130	9,5	Italy
Alitalia2001.txt	62	337	46	37	43895	76,4	154	9	Italy
Alitalia2002.txt	110	734	127	79	97159				
Alitalia2003.txt	211	894	139	108	96670				
Alitalia2004.txt	87	729	152	110	96294				
All Nippon Airway1996.txt	2	34	1		24143	51,9	126	14,2	Japan
All Nippon Airway1997.txt	32	86	11	2	29999	52,1	136	7,9	Japan
All Nippon Airway1998.txt	17	115	8	3	32155	49,8	143	7,9	Japan
All Nippon Airway1999.txt	22	156	12	4	34606	49,5	N/A	N/A	Japan
All Nippon Airway1999csr.txt		1			2154				

All Nippon Airway2000.txt	55	263	50	10	38585	48,4	144	8,8	Japan
All Nippon Airway2000csr.txt		6			3192				
All Nippon Airway2001.txt	48	345	58	15	51848	44,7	141	9,7	Japan
All Nippon Airway2001csr.txt	30	303	31	1	14766				
All Nippon Airway2002.txt	52	395	85	32	51511				
All Nippon Airway2002csr.txt	48	361	50	1	19566				
All Nippon Airway2003.txt	43	367	54	33	42768				
All Nippon Airway2003csr.txt	57	502	56	1	25803				
All Nippon Airway2004.txt	27	339	44	38	41446				
All Nippon Airway2004csr.txt	63	513	68	12	25892				
All Nippon Airway2005.txt	37	298	34	26	41642				
All Nippon Airway2005csr.txt	55	381	54	25	27572				
All Nippon Airway2006.txt	76	344	50	57	42570				
All Nippon Airway2006csr.txt	71	449	67	34	29831				
AmericaWestAir1996.txt	38	263	28	18	32239	41,6	101	11,9	USA
AmericaWestAir1997.txt	73	258	27	21	32660	42,2	102	12	USA
AmericaWestAir1998.txt	71	231	26	22	23807	43,6	111	12,1	USA
AmericaWestAir1999.txt	21	85	7	7	3557	43,8	123	11,9	USA
AmericaWestAir2000.txt	50	245	32	29	22456	43,5	138	11,1	USA
AmericaWestAir2001.txt	29	266	19	38	31425	47	146	9,7	USA
AmericaWestAir2004.txt	134	1442	55	78	167470				
amr1.TXT	109	707	48	20	102749				
amr1997.txt	45	251	19	21	26619				
amr1999.txt	52	169	12	31	19208	48,7	701	9,9	USA
amr2.TXT	103	640	59	14	89136				
amr2000.txt	38	188	14	21	20652	47,8	703	10,1	USA
amr2001.txt	26	225	12	21	22288	46,2	712	8,7	USA
amr2001csr.txt	36	161	23	9	14709				
amr2002.txt	46	542	25	41	47653				
amr2003.txt	32	574	39	47	44982				
amr2004.txt	51	1218	63	73	147080				
amr2005.txt	32	578	26	49	44557				
amr2006.txt	29	932	34	54	64102				
amr3.TXT	146	841	58	26	93426				
AtlasAir1997(1).txt	35	197	27	16	33560				
AtlasAir1998(1).txt	41	224	27	26	36444				
AtlasAir1999(1).txt	36	251	20	26	38546				
AtlasAir1999a(1).txt	30	231	20	25	37488				
AtlasAir2000(1).txt	27	101	12	7	9800				
AtlasAir2000(2).txt	41	302	26	24	43587				
AtlasAir2001.txt	51	308	21	36	43004				
AustrianAirlines1997.txt	55	109	13	11	26408	46,1	30	N/A	Austria
AustrianAirlines1998.txt	94	125	10	10	22795	61	35	9	Austria
AustrianAirlines1999.txt	82	140	21	11	28862	68,2	37	9,2	Austria

AustrianAirlines2000.txt	71	187	36	36	31441	65,7	33	9,9	Austria
AustrianAirlines2001.txt	62	173	43	43	29655	63,4	37	8,6	Austria
AustrianAirlines2002.txt	92	303	71	53	31936				
AustrianAirlines2003.txt	99	292	62	54	35353				
AustrianAirlines2004.txt	156	387	124	82	38345				
AustrianAirlines2005.txt	140	421	123	97	44193				
ba1997.txt	41	275	36	19	35562	71,2	271	8,6	United Kingdom
ba1998.txt	35	297	34	26	29855	66,9	280	9	United Kingdom
ba1999.txt	63	400	53	42	33113	73,5	276	9,2	United Kingdom
ba2000.txt	33	403	55	37	31395	70,1	311	9,2	United Kingdom
ba2000csr.txt	113	309	56	19	22949				
ba2001.txt	43	387	38	41	32408	66,3	296	9	United Kingdom
ba2001csr.txt	138	344	61	27	25068				
ba2002.txt	37	369	36	37	32824				
ba2002csr.txt	89	325	38	34	20552				
ba2003.txt	35	432	32	42	35167				
ba2003csr.txt	58	207	21	14	11496				
ba2004.txt	39	415	25	54	36876				
ba2004csr.txt	84	283	28	22	17469				
ba2005.txt	41	439	19	54	35763				
ba2005csr.txt	61	273	39	15	15914				
ba2006.txt	102	783	48	171	63357				
Braathens1996(1).txt	38	113	48	5	15155	62,6	29	N/A	Norway
Braathens1997(1).txt	32	92	28	6	17270	63,3	31	N/A	Norway
Braathens1998(1).txt	33	122	36	8	16261	61,4	36	6,2	Norway
Braathens2000(1).txt	40	114	23	8	15955	58,8	37	6,4	Norway
CathayPacific1997.txt	27	106	14	14	21835	63,6	62	11	Hong Kong SAR (China)
CathayPacific1998.txt	22	107	13	11	21890	62,7	72	12,1	Hong Kong SAR (China)
CathayPacific1999.txt	19	102	10	9	21309	69,6	77	11,8	Hong Kong SAR (China)
CathayPacific2000.txt	23	94	8	8	21735	71,4	64	13,1	Hong Kong SAR (China)
CathayPacific2001.txt	16	82	8	6	22853	68,3	75	11,7	Hong Kong SAR (China)
CathayPacific2002.txt	19	119	8	8	22621				
CathayPacific2003.txt	25	119	5	10	21740				
CathayPacific2003csr.txt	48	205	46	5	10302				
CathayPacific2004.txt	31	170	3	15	24295				
CathayPacific2004csr.txt	37	153	28	4	5727				
CathayPacific2005.txt	32	167	8	32	24953				
CathayPacific2005csr.txt	30	82	18		3443				
CathayPacific2006.txt	41	234	13	35	33745				
CathayPacific2006csr.txt	57	180	50	13	10048				

chinaair1997(1).txt	36	125	22	1	12888				
chinaair1998(1).txt	8	33	6	3	2617				
chinaair1998.txt	38	134	17	7	13288				
chinaair1999(1).txt	5	30		7	15220				
chinaair2000.txt	8	31	1	7	13959				
chinaair2001.txt	7	26	1	7	15774				
chinaair2002.txt	34	80	5	11	18951				
chinaair2003.txt	34	80	5	11	18951				
chinaair2003stat.txt	10	48	3	8	16819				
chinaair2004.txt	27	83	10	14	16974				
chinaair2005.txt	44	134	19	14	21228				
chinaair2006.txt	26	68	15	5	5798				
ChinaEasternAir1996(1).txt	28	111	5	5	19146				
ChinaEasternAir1999.txt	67	373	23	16	42465	56,6	N/A	N/A	China
ChinaEasternAir2000(1).txt	59	355	13	19	41764				
ChinaEasternAir2001.txt	62	271	25	20	52390	58,1	N/A	N/A	China
ChinaEasternAir2002.txt	74	285	15	34	54113				
ChinaEasternAir2003.txt	58	326	29	38	61191				
ChinaEasternAir2004.txt	59	290	13	40	58844				
ChinaEasternAir2005.txt	69	526	19	72	73650				
ChinaEasternAir2006.txt	34	523	29	66	99348				
ChinaSouthernAir1997.txt	215	605	85	64	164330	52,7	91	7,7	China
ChinaSouthernAir1998.txt	31	121	8	1	18610	50,2	102	7,8	China
ChinaSouthernAir2000(1).txt	36	112	11	12	27086	51	109	8,4	China
ChinaSouthernAir2001.txt	37	134	9	16	30496	56,6	111	9,1	China
ChinaSouthernAir2002.txt	34	119	5	19	50428				
ChinaSouthernAir2003.txt	60	317	13	25	81987				
ChinaSouthernAir2004.txt	53	335	15	23	84034				
ChinaSouthernAir2006.txt	40	474	26	36	90688				
cont1997.txt	37	243	12	26	24769	76,1	332	10	USA
cont1998.txt	36	260	17	26	36984	57,7	351	10,1	USA
cont1999.txt	33	235	9	19	40001	54,9	396	10,8	USA
cont2000.txt	20	214	10	21	35670	55,4	359	10,9	USA
cont2001.txt	75	539	34	63	70444	55,2	343	9,1	USA
cont2002.txt	22	176	15	6	13342				
cont2003.txt	19	205	18	11	13988				
cont2004.txt	13	185	19	10	13241				
cont2005.txt	13	156	13	10	13765				
cont2006.txt	30	469	26	49	75484				
czechAirlines2001.txt	61	231	92	11	32746	78,7	30	7,8	Czech Republic
czechAirlines2002.txt	71	252	44	29	32822				
czechAirlines2004.txt	163	396	97	45	52390				
czechAirlines2005.txt	130	377	90	59	59626				
delta1997.txt	22	266	14	20	22525	48,2	556	10,6	USA

delta1998.txt	36	317	18	31	27389	49,1	575	11,7	USA
delta1999.txt	46	328	31	42	28480	49,9	564	11,1	USA
delta2000.txt	67	261	21	45	29716	43,9	602	10,7	USA
delta2000_1.txt	36	195	6	44	24170	41,6	588	9,8	USA
delta2001.txt	32	299	12	43	33253				
delta2002.txt	37	367	20	52	41423				
delta2003.txt	80	1168	57	76	140191				
delta2004.txt	72	957	46	75	68658				
delta2005.txt	30	1047	37	75	66906				
delta2006.txt	40	1293	44	91	136984				
easyjet2000.txt	16	132	8	12	12496				
easyjet2001.txt	21	232	18	28	18702				
easyjet2002.txt	28	304	30	39	25708				
easyjet2003.txt	29	315	28	41	28365				
easyjet2004.txt	39	417	46	53	34130				
easyjet2005.txt	43	427	42	60	35666				
easyjet2006.txt	63	557	71	78	48373				
Expressjet2001(1).txt	91	573	26	77	96960				
Expressjet2002.txt	65	539	26	61	51942				
Expressjet2002a.txt	54	506	24	59	49569				
Expressjet2003.txt	54	517	30	56	67836				
Expressjet2004.txt	9	154	17	12	23657				
Expressjet2005.txt	11	136	12	18	24945				
Expressjet2006.txt	5	18			1115				
FrontierAirlines2003.txt	46	326	25	47	42617				
FrontierAirlines2004.txt	50	326	30	55	60394				
FrontierAirlines2005.txt	56	472	48	49	52268				
FrontierAirlines2006.txt	59	469	42	52	52164				
iberia1998(1).txt	158	401	76	138	49578	53,9	112	6,9	Spain
iberia1999(1).txt	157	322	47	141	54982	N/A	178	7,2	Spain
iberia2000(1).txt	152	429	63	137	55093	53,2	159	7,7	Spain
iberia2001(1).txt	173	525	88	155	66719	48,4	144	N/A	Spain
iberia2002.txt	177	676	109	168	63192				
iberia2003.txt	195	759	135	192	73603				
iberia2004.txt	164	795	138	138	76662				
iberia2005.txt	183	708	95	208	74929				
jal1997.txt	61	133	11	9	20214	61,7	137	9,7	Japan
jal1998.txt	61	132	22	15	22948	59,7	136	10,2	Japan
jal1999.txt	38	125	18	10	24284	60,9	138	10,4	Japan
jal2000.txt	51	181	40	8	26750	63,1	138	10,6	Japan
jal2001.txt	75	280	30	17	30285	58,2	133	10,2	Japan
jal2002.txt	54	196	24	5	29021				
jal2003.txt	35	171	32	8	26806				
jal2004.txt	43	200	38	6	25862				

JetBlue2002.txt	60	405	48	40	48974				
JetBlue2003.txt	58	337	38	43	50821				
JetBlue2004.txt	51	334	29	41	44620				
JetBlue2005.txt	62	463	46	44	60331				
JetBlue2006.txt	68	480	44	48	61279				
LaudaAir1997(1).txt	4	5	1	1	8953	71,9	17	9,8	Austria
LaudaAir1998(1).txt	38	79	7	5	9396	67,3	19	9,3	Austria
LaudaAir1999(1).txt	24	89	10	7	13755	69,3	22	8,4	Austria
LaudaAir2000(1).txt	1	12		3	23825	71,7	23	8,9	Austria
luft1996.txt	79	204	22	14	34286				
luft1997.txt	101	200	31	24	33459	68,6	270	9,6	Germany
luft1998.txt	101	260	28	52	49146	68,9	295	9,2	Germany
luft1999.txt	161	320	35	65	57875	70,2	303	9,2	Germany
luft2000.txt	170	357	48	76	65084	72,6	328	9,2	Germany
luft2001.txt	20	104	4	28	21524	71,5	372	N/A	Germany
luft2001csr.txt	86	103	26	23	15660				
luft2002.txt	136	357	35	138	57861				
luft2002csr.txt	85	131	17	19	19400				
luft2003.txt	164	467	71	139	60871				
luft2003csr.txt	86	166	30	19	20320				
luft2004.txt	183	579	74	166	68956				
luft2004csr.txt	66	162	25	23	16490				
luft2005.txt	336	689	94	193	77021				
luft2005csr.txt	66	126	41	14	17662				
luft2006.txt	413	839	107	245	89769				
MesaAir1996(1).txt	15	129	15	2	13635				
MesaAir1997(1).txt	26	147	15	6	15343				
MesaAir2001.txt	30	257	12	19	30176				
MesaAir2002.txt	29	260	15	10	30495				
MesaAir2003.txt	22	277	14	14	36508				
MesaAir2004.txt	33	297	17	20	41682				
MesaAir2005.txt	36	331	16	24	43809				
monarch1999(1).txt	5	68	2	3	7503				
monarch2000(1).txt	4	63	1	1	7696				
monarch2001(1).txt	7	69	2	1	7973				
monarch2002(1).txt	6	79	2	1	8724				
monarch2003(1).txt	5	64	2	1	9577				
monarch2004.txt	5	66	2	2	9656				
monarch2005(1).txt	6	65	2	2	8860				
Northwest1996(1).txt	47	228	18	12	27304	62,8	399	9,6	USA
Northwest1997(1).txt	54	214	21	19	27966				
Northwest1997b(1).txt	51	206	21	20	26720	62,4	405	9,5	USA
Northwest1998(1).txt	49	191	28	20	26868	56,4	409	8,7	USA
Northwest1999(1).txt	59	219	32	25	25337	60,3	409	9,7	USA

Northwest2000(1).txt	49	225	21	26	26841	61,2	424	9,8	USA
Northwest2001.txt	41	317	20	42	45574	62,5	444	9,2	USA
Northwest2002.txt	32	402	15	26	54069				
Northwest2003.txt	45	423	19	32	46990				
Northwest2004.txt	43	518	18	35	63546				
Northwest2005(1).txt	41	627	25	38	77562				
Qantas1997.txt	24	104	19		5848	62,9	98	11,8	Australia
Qantas1998.txt	47	393	20	22	31174	63,4	98	11,6	Australia
Qantas1999.txt	40	228	17	11	20740	51	100	11,8	Australia
Qantas1999fs.txt	14	241	2	20	18219				
Qantas2000.txt	29	197	13	6	15830	63,1	119	11,1	Australia
Qantas2000fs.txt	13	252	2	20	18729				
Qantas2001.txt	24	192	9	16	16940	52,3	126	10,9	Australia
Qantas2001fs.txt	18	274	2	21	22745				
Qantas2002.txt	20	188	9	20	20162				
Qantas2002fs.txt	14	295	3	21	25473				
Qantas2003.txt	47	371	25	25	22865				
Qantas2003fs.txt	11	349	2	22	23899				
Qantas2004.txt	49	651	38	39	34166				
Qantas2004fs.txt	14	496	11	22	28779				
Qantas2005.txt	65	892	37	66	60761				
Qantas2006.txt	78	1020	40	72	69278				
ryanair1998(1).txt	19	251	13	10	22241	71,5	21	4,6	Ireland
ryanair1999.txt	20	306	13	14	20816	75,5	26	N/A	Ireland
ryanair2000.txt	21	295	34	20	20244	77,5	33	8,7	Ireland
ryanair2001.txt	16	267	26	27	21456	75	39	8,5	Ireland
ryanair2002.txt	19	305	20	45	22698				
ryanair2003.txt	16	358	20	43	25385				
ryanair2004.txt	25	380	27	43	29041				
ryanair2005.txt	22	387	23	41	27422				
ryanair2005b.txt	86	570	58	89	125516				
ryanair2006.txt	27	392	19	67	30590				
ryanair2007.txt	24	325	24	60	62967				
sas1997.txt	143	312	64	44	51172	60,1	164	7,9	Denmark, Norway, Sweden
sas1998.txt	134	272	47	49	49889	62,9	179	7,6	Denmark, Norway, Sweden
sas1999.txt	209	379	77	60	53947	68,8	181	7,7	Denmark, Norway, Sweden
sas2000.txt	208	375	60	71	57585	69,9	183	7,5	Denmark, Norway, Sweden
sas2001.txt	216	447	101	82	66064	69,4	190	7,3	Denmark, Norway, Sweden

sas2002.txt	251	674	172	85	77938				
sas2003.txt	257	699	185	134	86768				
sas2004.txt	288	752	182	123	89974				
sas2005.txt	248	853	144	139	98373				
sas2006.txt	253	892	126	158	92707				
SingaporeAirlines1998.txt	47	124	19	8	30549	69,9	94	11,4	Singapore
SingaporeAirlines1999.txt	60	140	23	5	30598	72,2	92	11,6	Singapore
SingaporeAirlines2000.txt	45	207	23	4	32578	73,3	90	12,5	Singapore
SingaporeAirlines2001.txt	49	182	18	29	39647	69	101	11,8	Singapore
SingaporeAirlines2002.txt	63	299	25	33	48838				
SingaporeAirlines2003.txt	42	319	30	133	48037				
SingaporeAirlines2004.txt	59	377	34	119	49510				
SingaporeAirlines2005.txt	57	385	38	91	49913				
SingaporeAirlines2006.txt	62	450	41	94	57483				
SingaporeAirlines2007.txt	49	532	40	105	59563				
SkyWest1997(1).txt	14	127	10	5	11339				
SkyWest1998(1).txt	22	71	7	7	21717				
SkyWest1999(1).txt	34	110	5	8	12244				
SkyWest2000(1).txt	42	123	5	13	13535				
SkyWest2001(1).txt	45	138	7	12	12646				
SkyWest2002(1).txt	32	191	8	23	46118				
SkyWest2003.txt	46	229	13	29	28897				
SkyWest2004.txt	41	224	21	21	43935				
SkyWest2005.txt	50	365	27	50	37625				
SouthwestAirlines1996.txt	19	152	19	2	17789				
SouthwestAirlines1997.txt	23	155	21	20	17419				
SouthwestAirlines1998.txt	22	156	13	17	20070				
SouthwestAirlines1999.txt	12	119	2	18	13786				
SouthwestAirlines2000.txt	39	112	9	21	18220				
SouthwestAirlines2001.txt	22	161	8	20	24145				
SouthwestAirlines2002.txt	24	317	16	35	39931				
SouthwestAirlines2003.txt	33	318	17	38	39230				
SouthwestAirlines2004.txt	26	351	18	42	43420				
SouthwestAirlines2005.txt	47	431	32	48	43573				
SouthwestAirlines2006.txt	52	484	33	52	55745				
swiss1997.txt	26	52	6	4	12886	68,2	63	10,8	Switzerland
swiss1998.txt	28	59	19	3	13796	64,2	68	10,6	Switzerland
swiss1999.txt	29	60	17	6	14566	68,7	74	11,8	Switzerland
swiss2000.txt	32	92	13	6	16835	58,5	75	11,9	Switzerland
swiss2001(1).txt	47	115	24	15	20362	65	78	N/A	Switzerland
swiss2002.txt	111	394	39	60	45685				
swiss2003.txt	60	371	41	54	40766				
swiss2004.txt	73	419	49	56	46065				
ThaiAirways1999.txt	9	63	7		9607	60,4	77	8,9	Thailand

ThaiAirways2000.txt	52	157	46		18877	61,7	80	9,4	Thailand
ThaiAirways2001.txt	48	166	36	5	21041	91,4	N/A	N/A	Thailand
ThaiAirways2002.txt	70	245	37	19	25791				
ThaiAirways2003.txt		38		5	8969				
ThaiAirways2004.txt	133	499	74	76	41903				
ThaiAirways2005.txt	89	470	94	101	44183				
ThaiAirways2006.txt	2	20		8	9063				
ual1997.txt	23	155	16	7	18949	54	574	10,4	USA
ual1998.txt	20	156	16	6	17010	50,8	576	10,5	USA
ual1998a.txt	3	31	3	1	3197				
ual1999.txt	30	142	8	9	17274	52,4	594	10,6	USA
ual2000.txt	56	189	22	12	18793	52,5	604	10,5	USA
ual2001.txt	25	231	19	33	25562	34,3	537	10,4	USA
ual2002.txt	52	641	33	33	57787				
ual2003.txt	44	559	23	29	48852				
ual2004.txt	42	718	23	26	64004				
ual2005.txt	39	744	31	41	63190				
ual2006.txt	37	837	53	49	84651				
usair1997.txt	6	32	10	1	2271	60,5	376	9,3	USA
usair1998.txt	36	289	42	28	35137	61	375	9,2	USA
usair1999.txt	34	291	33	24	33137	48,8	392	9,4	USA
usair2000.txt	41	203	24	19	31198	58,3	412	10,2	USA
usair2000_1.txt	54	570	37	34	63017				
usair2001.txt	43	535	45	35	57119	53,8	340	9,8	USA
usair2002.txt	47	907	49	35	69184				
usair2003.txt	34	647	34	33	61863				
usair2004.txt	60	672	40	77	101617				
usair2005.txt	87	1391	53	86	156691				
usair2006.txt	59	1198	48	93	175509				
Westjet1999.txt	75	422	43	26	36390				
Westjet1999a.txt	21	86	12	9	8032				
Westjet2000.txt	28	122	8	11	10014				
Westjet2001.txt	24	122	13	13	14537				
Westjet2002.txt	35	195	23	14	21149				
Westjet2003.txt	38	176	34	17	20152				
Westjet2004.txt	43	252	42	23	21842				
Westjet2005.txt	34	203	25	14	19522				
Westjet2006.txt	37	210	29	15	20468				