What drives airline operating margins? The impacts of ownership, business model, and institutions.

by

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Certificate of Authorship

I, L. A. W. D. O. N. G. U. S. A. S., hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgment is made in the thesis [or dissertation, as appropriate]. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

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Glossary

Industry Measures:

Average Fare  Revenue for a flight sector divided by the number of passengers carried

ASK  Available seat Kilometre. (Passenger capacity unit)

ATK  Available Tonne Kilometre (Uplift capacity unit)

RPK  Revenue Passenger Kilometre (Passenger load unit)

FRTK  Freight Revenue Tonne Kilometre (Freight load unit)

RTK  Revenue Tonne Kilometre (Uplift load unit)

Yield  Unit revenue generally measured in cents/RPK

Terms:

ASA  Air service agreement

ASEAN  Association of Southeast Asian Nations

ATW  Air Transport World. Monthly industry journal

A330  Airbus A330 commercial aircraft

B747  Boeing B747 commercial aircraft

Block hours  The elapsed time between an aircraft pushing back from the gate at the departure airport and shutting down its engines after arriving at the gate at the arrival airport.

CAB  United States Civil Aeronautics Board

CASA  Civil Aviation Safety Authority (Australia)

Carrier  Airline

Configuration  The interior seating layout of an aircraft

EU  European Union

FSNC  Full service network carrier
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<td>GDS</td>
<td>Global distribution system</td>
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<tr>
<td>Legacy carrier Full Service Network Carrier</td>
<td>Low cost carrier</td>
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<tr>
<td>Longhaul</td>
<td>Intercontinental journeys usually in excess of 6 hours.</td>
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<tr>
<td>Hub</td>
<td>Airport used to expand network reach by facilitating flight connections</td>
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<tr>
<td>Hybrid carrier</td>
<td>An airline that combines some features of both LCC and FSNC models</td>
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<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
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<tr>
<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
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<tr>
<td>Interline</td>
<td>A passenger connection between two airlines</td>
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<tr>
<td>Narrowbody</td>
<td>Single-aisle small to medium size passenger jet (e.g. Airbus A320)</td>
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<tr>
<td>State-owned</td>
<td>An airline with more than 50% of its ownership in the hands of a government, a government department, a state investment vehicle, or a sovereign wealth fund.</td>
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<td>Seat pitch</td>
<td>A measure of passenger space representing the distance between the back of an aircraft seat and the back of the seat in the row in front.</td>
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<td>UD</td>
<td>Uplift-Discharge. A single flight, which may be part of a longer origin-destination (OD) journey (e.g. a passenger with an OD Wellington (WLG) to Singapore (SIN) may travel on two flights connecting in Sydney (SYD) The UD would be WLG-SYD and SYD-SIN.</td>
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<td>Flight sector</td>
<td>A non-stop aircraft journey between two airports – may be part of a longer multi-sector flight.</td>
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<tr>
<td>WACC</td>
<td>Weighted average cost of capital</td>
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<tr>
<td>Widebody</td>
<td>Multi-aisle large commercial passenger jet (e.g. Boeing B777)</td>
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Abstract

The airline industry delivers a poor return on its invested capital. The industry's regulatory framework, a perishable product, rivalry based on price competition, vulnerability to volatile fuel prices, and low switching costs for customers contribute to the industry's poor margins. Domestic deregulation began in the United States in the 1970's. Deregulation and privatisation followed in Europe, Australasia, and much of Asia, but international aviation remains bound by institutions. Low cost airline innovation has expanded the industry's business models but not its institutions. Many major airlines in Southeast Asia and the Middle East remain state owned. This thesis reports research on airline strategy and the impacts of state-ownership and institutions on airline operating margins. The quality of institutions is found to have a greater impact on strategy outcomes than ownership. The study finds that reduced regulation is more likely to improve operating margins than further privatisation. Permitting consolidation through cross-border mergers, adopting multi-lateral market access agreements, and imposing global limits on state aid to airlines are identified as issues for policy development and further research.
Chapter One

Introduction and Research Overview

In 1958 the first Boeing 707 and McDonnell Douglas DC8 aircraft entered service, and as one of a series of strategic inflections that reshaped the airline industry (Grove 1998), opened the way for five decades of growth in air travel (Leary and Trimble 1994). Other externally driven changes followed with the introduction of wide-bodied aircraft (e.g. Boeing B747) in the early 1970's, Global Distribution Systems (GDS) in the early 1990's and Internet selling at the turn of the 21st Century. Each strategic inflection brought with it airline business model innovation (Christensen 2000, Markides 2006). Airline industry capacity continues to grow, with 340 billion seat kilometers of capacity offered monthly by 2010, an increase of 40% over the decade (Boeing 2010). By contrast with the advances in both aircraft technology and distribution, the industry continues to operate in the mid 20th century regulatory environment established at the Chicago Convention in December 1944 (ICAC 1944) that framed national entitlements to international air routes.

Thirty-five years after the United States began domestic deregulation, the concept of 'open skies' is far from achieved (Pearce 2009). Access to international markets continues to be limited by nationality requirements and air service agreements established under the Chicago Convention (Richards, 2001). Revisiting the Five Forces model for industry analysis, Porter (2008:84) observed the continuing weak performance of the airline industry:
The average return on invested capital varies markedly from industry to industry. Between 1992 and 2006, for example, average return on invested capital in U.S. industries ranged as low as zero or even negative to more than 50%. At the high end are industries like soft drinks and pre-packaged software, which have been almost six times more profitable than the airline industry over the period.

State ownership and control of airlines remains widespread, and the industry delivers operating margins that fall well short of the cost of capital employed. With industry-wide net operating losses occurring in the five years between 2001-2010 and poor returns delivered in the remaining years of the study, the global airline industry remains a net destroyer of shareholder value (Cordle 2010).

The research described in this thesis elucidates the drivers of airline operating margins in Europe, the Middle East and the Asia-Pacific region, and establishes a conceptual framework that explains the impacts of state ownership and institutional (economic freedom) influences on the financial performance of commercial airlines. It will be argued that both majority state ownership and poorer institutional quality in an airline’s host country produce poorer financial results, and that institutional factors have the stronger impact of the two. Furthermore it will be argued that this negative impact is multiplied when airlines face both state-ownership and a poor institutional environment.

In industries with fewer regulatory constraints, firms participating in a global market would enjoy the freedom to locate the business in countries that offer factor advantages. Airlines remain bound however, by stringent ownership rules included in route access agreements. The company must remain based in the
country or region whose traffic rights they utilise. The 'Location' aspect of Dunning's (1988) eclectic paradigm and Porter's (1990) Diamond model outline the benefits of adopting host locations that provide a competitive advantage to firms ranging from skilled labour to geographic location, but the regulatory framework in which aviation operates is still dependent on country to country (or at best region to region) bilateral agreements to secure market access. Richards (1999:11) identifies the role that politicians can ascribe to international institutions, where rather than building institutions for the common good, the objective becomes the capture of wealth for domestic redistribution. Richards further observes (1999:14) that choosing a cartel structure for the airline industry reinforces the message that governments were not setting out to create an airline industry that achieved the greatest allocative efficiency or mutual gains from the aviation institutions established. In this thesis it is argued that this tension between an internationally efficient industry and the domestic policy objectives of national governments continues today.

The majority ownership requirement of the bilateral agreements limits foreign ownership or cross border mergers of airlines. Some flexibility has emerged with the creation of an intra-Europe market, and the freeing of markets between the European Union and North America (European Union 1999), but this deregulation has yet to permit foreign ownership of United States carriers. Recent consolidation in the United States has seen mergers of large carriers, including the merger of Northwest with Delta Airlines, and of Continental and United Airlines. These carriers see little impact on their access to traffic rights because they remain able to access United States traffic entitlements. European consolidation took a different form, with the merged or acquired airlines continuing to operate their
original brands from home country airports (e.g. Swiss International's continued Zurich-based operations after its acquisition by German flag carrier Lufthansa). Rather than 'seeking' a host country offering the best factor advantages, airlines are locked by regulation into 'taking' the factor conditions available in their home state.

For the full service network carriers (FSNC) that are predominantly the traditional national flag-carrier airlines (e.g. British Airways), deregulation in markets such as Europe and Australasia has brought the arrival of low cost carrier (LCC) competitors increasing competitive pressure on pricing and regional route structures. Despite these competitive pressures, the FSNC in the more free markets deliver the strongest operating margins of the industry, and come closest to covering their cost of capital throughout the business cycle (Douglas 2009). Their low cost competitors have achieved rapid growth, with Ryanair in Europe now carrying more than 73 million passengers annually (Ryanair 2011), but the LCCs have also failed to meet the operating margins required to service their capital base, and are at increasing risk from the volatility of oil prices (Douglas 2009, Morrell 2007).

While LCC growth has been strong in Europe and Southeast Asia, the fastest growth in FSNC capacity since 2001 has come from airlines in the Middle East. Following a nation-building approach adopted by Southeast Asian airlines a generation earlier (Bowen 2000), the Arabian Gulf state airlines identified by the Association of European Airlines (Flint 2011, Haneke 2009) have adopted strategies more focused on scale and market share expansion than on near term profitability. The airlines are required to draw on 6th freedom connecting traffic to
support growth, as home country populations are small\(^1\). With small home markets and capacity growth exceeding global traffic growth (Emirates 2011, Flint 2011), the Gulf carriers must continue to take market share from existing airlines as their fleet expansion continues. Where this leverages location advantages to allocate resources effectively it is representative of positive industry deregulation and rationalisation. Where the growth is shaped by domestic political objectives rather than allocative efficiency (Richards 1999, 2001), institutional factors are introduced into market, and the capacity of neo-classical economic analysis to explain the industry is arguably limited (Aspromourgos 1986).

The Association of European Airlines (Flint 2011) identified concerns with the rate of capacity growth in the Middle East region noting that:

> ...the three [Emirates, Etihad, Qatar Airways] have more widebody seats on order than the entire US industry has in its current fleet, 425 brand new long-haul aircraft in the next five years. Does it make sense for airlines and travelers worldwide if three carriers—two of which have never made a profit—collectively commit $100 billion to transforming the aviation map of the world?

Neo-classical economic theory considers the mutual interactions of demand and supply for commodities and factors of production (Aspromourgos 1986:265). The theory holds that privatisation helps industry performance by imposing fiscal discipline. Privatised airlines face stock market reporting standards, and shareholder pressure for maximised financial returns. Backx Carney and Gedajlovic (2002) and preliminary studies for this research (Douglas 2010a) reported in Chapter Four, identify evidence that the privatisation of airlines leads

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\(^1\) The United Arab Emirates population in 2010 was 8.6 million, with fewer than 1 million Emiratis and 7.3 million expatriates (Emirates 24/7, 2011), while Qatar's population was 1.7 million (Qatar Statistics Authority, 2011).
to improved operating margins. This present study extends the privatisation argument, and contends that neo-classical analysis alone cannot explain the performance of the airline business. Rather, broader institutional issues must be included to understand operational performance and strategy development in the industry.

In essence, privatising an airline is not enough, but privatisation combined with a home base that offers greater economic freedom, through reduced regulation and greater institutional quality (Gwartney 2009), can be expected to deliver improved airline operating margins. This research shows that most airlines in the more-free economies are out of state hands. For those in less-free economies and under state control, governments looking to advance domestic issues over allocative efficiency (Richards 1999, 2001) are likely to stifle performance. It is unlikely that simply providing more liberal access to markets or routes will have any significant impact on improving the financial outcomes of these airlines.

1.1 Research objectives

The thesis considers the aviation markets in Europe, the Middle East, and the Asia-Pacific region. Approaches to deregulation, privatisation, and regional (as opposed to national) markets vary between the regions. While Europe has a well-developed aviation policy based in legislation the markets of the Asia-Pacific region are diverse. The ASEAN countries have established a pathway to regional deregulation, but it relies on consensus-based implementation. In Northeast Asia little regional progress exists towards a regional framework. The thesis will consider the
industry's future path by contrasting aviation in the Asia-Pacific region with aviation in Europe and the Middle East.

The international airline industry is interconnected, with major carriers offering global reach by combining their networks with those of alliance partners. The ability to serve markets with indirect connecting flights expands competition and offers growth opportunities to airlines with small home markets. Widespread deregulation and privatisation already delivered in North America, Europe, and Australasia are not as widely observed in Southeast Asia and the Middle East where state-ownership is widespread.

This research is an inductive study, where hypotheses have been shaped from emerging findings and draw on multiple data sources. The nineteen (19) year timeframe of the research was determined by limited access to reliable data prior to 1990. To build a comprehensive database of the airline industry, revenue and cost data were consolidated from several commercial databases, government agencies and industry journals. Definition of the problem was achieved with 'a priori' constructs, used to shape the research, that drew on prior knowledge and understanding of the industry and its operating data.

The operating results of 131 airlines are consolidated in the study database. The study is based in quantitative analysis, and is positioned in a post-positivist paradigm. Research in this mode requires 'an ability to see the whole picture [and] to take a distanced view or an overview' (Ryan 2006:18). This kind of objectivity is different from 'just the facts' (Ryan 2006) and requires an understanding of the context. The diverse commercial operations and spread geographic locations of
companies in the study also required pragmatism in the approach. The requirements of this pragmatic approach are explained in Chapter Six.

1.2 The role of the researcher’s experience

The balance between addressing the particular and addressing the general will be an important element of the research. In this situation Cresswell (2003) identifies the researcher’s experience and training as an important element of the research process. As with Ryan (2006), Cresswell (2003) notes that the researcher’s focus will be on objective analysis. This objectivity requires both an understanding of the context, and the ability to stand back to observe. Clark (1994:81) describes objectivity as an attempt to ‘diminish or eliminate bias, to study the world itself, to be fair and open to all sides of an argument, and to see things the way they really are’. Gauch (2002:36) finds in objectivity, a willingness to allow facts and truth to overwhelm prejudice. It is recognised that this research has an industry ‘insider’ addressing industry activity that this insider status is leveraged to explore the issues that arise from the deductive research, and that this brings risks of subjectivity. A protection from subjectivity, beyond the desire to be objective and allow facts to win through (Gauch 2002), is the imposition of methodological rigour (Clark 1994:88). Rigour is brought to this research through the use of a comprehensive database that eliminates the risk of sampling bias, through the cross validation of secondary data sources to assure consistency, and through database testing to identify input errors.

This rigour also means that the quantitative study of data in the research considers the reality of an ‘object’, measured by external and objective standards, rather than
the approach of phenomenology where the reality of an object is' inextricably related to a person's consciousness of it' (Creswell 1997). In phenomenology, the intent is to capture the lived experience into a description that reveals the essence of the experience (Smith 2009). Capturing the lived experience requires an 'outside' observer to capture a perception of the experience at a given point in time (van Manen 1990, Dowling 2007), and to reflect on the meaning of the experience at a later point in time, using a level of detachment that is not available to this researcher. A level of detachment appropriate to an outside observer is unlikely to be achieved by a researcher remaining actively engaged with consultancy to airlines within the study population, and contributing to strategy development.

1.3 Research overview

The global airline industry rarely covers its cost of capital, even in the most profitable years. Madanoglou Chang and Chou (2004:297) calculated the economic value destroyed by United States carriers, measured by the shortfall of net operating profit against the capital charge in the decade from 1990-1999, as $US1.92 billion. Of the major airlines in the United States, only Southwest Airlines achieved a positive economic value creation of $US32 million over that study period. At a global level, an International Air Transport Association (IATA) value chain study identified an annual shortfall of $US11.8 billion in airlines' return on invested capital against investor expectations for the period from 1996-2004 (IATA 2004). This study separated results for the period before the September 11, 2001 terror attacks in New York from those in the economic downturn that followed. Even in the relatively benign period from 1996-2000, the industry failed
to meet its cost of capital, achieving a return on invested capital of 6.1% against a cost of capital of 7.3% (IATA 2004:1).

The industry remains fragmented and constrained by a regulatory structure that dates from the final days of World War 2 (ICAC 1944), and depends heavily on bilateral and multilateral treaties for market access. This research of the airline markets of Europe, the Middle East, and the Asia-Pacific region follows the uneven development of the industry as it transitions from the rigorous structure of post-war regulation defined by the 1944 Chicago Convention (ICAC 1944) to the more aggressive competitive environment of the early 21st century. This understanding and analysis of the structure of the industry, its regulatory limits, and its financial performance informs the opening position of the inductive research undertaken.

The results of the research described in this thesis are intended to contribute to:

1. A stronger understanding of elements of competitive strategy theory in an applied environment,

2. The development of management practice and policy in Asia-Pacific aviation, and

3. A stronger understanding of the relative impacts of ownership (privatisation) and economic freedom (institutional quality) on airline performance.

This understanding is placed in a context where the ASEAN group of countries following a pathway to aviation deregulation, in an environment where large low cost airlines have emerged as competitors to traditional national flag carriers, and where Chinese aviation is growing rapidly.
The author's experience includes management and consultancy roles in airline pricing, alliances, revenue management and commercial strategy. This experience informs and supports this research into innovation and airline strategy. In recent years this work has developed a particular focus on airlines in the Asia-Pacific region.

During the seven-year course of the research, progress has continued on aviation market deregulation between Europe and North America, illustrated by the implementation of the EU-US Air Transport Agreement (AEA 2010). Mergers of full service network flag carriers in the US and Europe (Buyck 2011), and the restructure of several state-owned European airlines starved of state subsidy including Olympic Airlines of Greece and Italy's Alitalia, demonstrate some movement towards pragmatism in the global aviation industry. This liberalisation and restructuring is less evident in Southeast Asia where significant state ownership of airlines remains common, and where evidence of significant institutional involvement in national economies is widespread (Peng 2000, Gwartney 2009). That is, economic decisions are impacted by institutional pressures, and not purely the result of individual (or aggregated) rational micro-economic analysis (Peters 2005:21, Williamson 1988).

Institutional quality can be observed through several indexes of countries' measures of economic freedom, including the Economist Intelligence Unit's Index of Democracy, the Fraser Institute's Economic Freedom of the World Index, and the Wall Street Journal - Heritage Foundation's Index of Economic Freedom. This research adopts an index of economic freedom as a latent variable for institutional
impact and quality. Use of the index permits this study to quantify the financial impact of institutional pressure on airlines, whether state or non-state owned. For example, the situation of 51% state-owned Thai Airways demonstrates the tension between profit-maximising and institution-serving roles, and through that the tension between neo-clasical economics and new institutional economics. While 49% of the stock of Thai Airways is not held by the State, the government sees the airline as an instrument subject to government policy, creating a tension between profit maximising strategy settings and the obligations to it 51% state shareholder. Quoted in Thailand’s English language daily newspaper, The Nation

*Thai Airways President, Piyasvasti Amranand, stated the carrier plans to invest approximately USD4.8 billion (THB150 billion) over the next five years to improve services and purchase new aircraft.*

While later in the same article, then Prime Minister Abhisit Vejjajiva states that the Thai Government position is:

*Their [Thai Airways International’s] next challenge will be to maintain this success. THAI is a state enterprise, and though it serves the government, it must also be competitive as a private firm. This makes THAI’s work quite complicated.* The Nation, 03-Sep-2010

This tension between ‘being competitive as a private firm’ and ‘serving the government’ (even where a significant portion let alone a majority shareholding of the firm is not held by the state) forms the basis for the institutional element of this study. Examples of state interference can be found in other ASEAN airlines, including Indonesia’s Garuda where the company’s privatisation was marred by government interference. Reuters reporting in the Business Spectator (2011) on the slump of Garuda’s shares the day after its stock market listing in February 2011 noted:
They [investors] were put off by pricing that valued Garuda far higher than its regional peers after the government intervened to push the initial offer range higher, at a time when growing inflation and oil prices cast doubt on the airline sector. ..... Garuda said investors only took up 3.2 billion shares from the 6.3 billion offered so that underwriters Bahana Securities, Mandiri Sekuritas and Danareska Securities had to take up the remainder, or more than $US253 million.

The thirty-four year industry experience of the researcher, including recent pricing and strategy consultancies with airlines including Malaysia Airlines, Thai Airways International, and Myanmar (Burmese) domestic carrier Air Bagan, underpins this study, providing an experiential base in which to ground the research. These consultancies and several published studies (Douglas 2005, 2007, 2009, 2010a, 2010b) ensure that the researcher retains a current understanding of the management issues of the industry, and that this in turn informs the a priori constructs of the research. Earlier experience with an airline privatisation at Qantas Airways and management of the commercial joint-venture with initial 25% shareholder British Airways offers an insider's insight to the impacts of privatisation on national carriers.

The intention of inductive research is to allow theory to emerge from the research (Eisenhardt 1989b, Trochim 2000, Creswell 2003). A theoretical investigation of the relationship between an airline's operating margin and its nationality was undertaken to ground the study. Findings from this and from two other preliminary studies for this research are reported in Chapter Four. Analysis of extensive industry databases formed the basis of the initial research. The literature review was directed to the areas of competitive strategy, industrial economics, institutional economics, innovation, bounded theory, economic freedom, and airline deregulation. This literature supports
the research as it addresses the impacts on airline competitive strategy of the tensions between institutional and neo-classical economics, as well as the disruptions that flow from endogenous and exogenous drivers of innovation. Through the theoretical investigation, a conceptual framework was developed using operating margin as a measure of the effectiveness of airline competitive strategies. Operating margin is the outcome of the strategy deployed and a measure of the operational effectiveness of an airline. Observed over time, it allows the long run relationship between ownership, nationality, and strategic effectiveness to be measured.

This study utilises a database containing nineteen (19) years of airline operating data consolidated by the industry journal ‘Air Transport World’ and by the United Nations aviation agency the International Civil Aviation Organisation (ICAO). Industry revenue and cost data was supplemented with GDP data from the World Bank, airline ownership data from Thomson-Reuters and the Centre for Asia Pacific Aviation (CAPA), and economic freedom indices from the Fraser Institute.

Analysis of the database required extensive preparation of the historical material. Missing data were sought from alternative sources including company annual reports, government agencies, and trade journals. Financial data from all sources were consolidated into a single database. Filters were applied to remove airlines not achieving operating revenues of $100 million in at least one year of the study, or with fewer than three years of data reported. This filter excludes very small operators with extremely limited fleet and network structures, as well as new entrant airlines incurring high ratios of cost to revenue during the start-up phase of the business. The $100
million threshold represents a notional fleet of four narrow body (Airbus A320-200 or similar) aircraft with an average daily utilisation of 10 hours, 180 economy seats, 75% seat factor and 8 US cents/revenue passenger kilometre yield. This yield implies an average fare of $96 between Jakarta and Kuala Lumpur, or of $53 from Zurich to Berlin. The filters remove several airlines including Oasis Hong Kong, MaxJet, and OzJet, that misjudged market entry and failed to gain a viable foothold in the marketplace. The failure of several airlines attempting long haul niche business models is addressed in Chapter Four.

The emerging hypothesised relationships were tested statistically in SPSS using linear regression and ANOVA correlation studies. Initial linear regression and correlation studies of the relationship between ownership and institutional quality (using economic freedom as a proxy for institutional factors) were complicated by the extended study period. The airline industry does not conform to a regular pattern or cycle, and the nineteen year time series contains both disruptive single events such as the September 2001 terrorist attacks in New York, and external technology innovations such as online selling. Two-way ANOVA analysis however affirmed the significant impact of institutional quality on airline operating margin that was observed in earlier pilot studies reported in Chapter Four.

To address the impact of unpredictable exogenous events, and to enhance the understanding of external factors, the database was enhanced with categorical (non-metric) fields (Hair Anderson Tatham and Black 1998:244), identifying geographic region, home state, business model, economic freedom category, a GDP growth scenario, and ownership. The strength of categorising data is that it captures qualities or characteristics, and can be usefully summarised by using
'cross-tabs' (two-way tables) to summarise the characteristics of two variables at once.

During the course of the research, a pilot study was conducted with a two-year sample of the database, covering a period of positive profit performance for the global airline industry in 2006-2007. This pilot study (Douglas 2010b) was used to validate both the data preparation process and the conceptual model.

1.4 Thesis framework

This thesis is comprised of eight chapters. Chapter One presents the research motivation, the research objectives, a definition of key terms and measurements, and an overview of the conceptual framework and the research methodology. Chapters Two and Three present a review of the literature, with Chapter Three focused on the application of the competitive strategy models to the airline industry. A theoretical investigation of the academic literature in the fields of industrial economics, institutional theory, the evolution of regulation in the aviation industry, and measures of economic freedom is described. From this review of the literature, the two key variables of ownership and economic freedom and their impact a tightly regulated industry are considered. Chapter Four presents a synthesis of three papers developed during this research that contributed to the methodology and structure of the research. The pilot studies affirmed the adoption of the ICAO and Air Transport World databases for the thesis research. Consolidation of the parallel databases, sourcing of missing data from alternative company and industry reporting, and validation of data accuracy with line graph plots of revenues and costs followed. The relative stability of the
growth of an airline's costs from year to year makes data errors clearly evident in line graph plots.

Research on airline deregulation is heavily skewed towards the United States experience (see Brueckner and Spiller 1994, Borenstein and Rose 1994, Miller and Chen 1994, Dresner Windle and Zhou 2002, Brueckner and Pai 2009) with some more recent research addressing European deregulation and privatisation (e.g. Button 1996, Adler 2001). Airline privatisations differ from the privatisation of other state utilities and corporations in that their operations almost invariably extend beyond their home country. Private, privatised, part state-owned and fully state-owned airlines compete in multiple markets, and once privatised arguably have less specific ongoing social responsibilities than is the case for privatised energy utilities or telecommunication networks who provide basic community services and whose operations usually remain limited to their domestic markets (Jones 2000, Martin and Parker 1997, Melville 1994).

The United Kingdom was an early mover on airline privatisation with British Airways floated onto the London stock exchange in July 1987. Moon (2005) identifies the role of European governments and in particular the United Kingdom government in assuring responsible corporate behaviour by firms that have been privatised as governments reduces their role in ownership (Moon 2005).

The limited research available on airline performance after deregulation and privatisation, further constrained by the incomplete process of both deregulation and privatisation in Europe and the Asia-Pacific region, provides the opportunity for this study to integrate analysis of both ownership and institutional factors. The nineteen year data set also allows this study to extend earlier research undertaken
before the disruptive impacts of Internet distribution and the low cost carrier model were present in industry data.

Chapter Five outlines the research variables, research questions, emergent research hypotheses, and a study of the evolution of the post-war international airline industry. Chapter Six outlines the research design and the methodology used in this study, with Chapter Seven presenting the findings of the hypothesis testing and the database analysis. Finally Chapter Eight presents the conclusions and the policy recommendations that are drawn from the study.
Research process.

Phase 1. The initial research concept is identified as the broad airline industry failure to achieve long-run profitability and adequate return on assets.

Phase 2. The academic literature in the fields of competitive strategy, neo-classical and institutional economics, and innovation is addressed and the conceptual model for the research is established.

Phase 3. A dataset is assembled from a range of industry sources that contains operating revenues and operating costs for European, Middle Eastern and Asia-Pacific airlines for 19 years from 1990 – 2008.

Phase 4. A series of studies is undertaken to test the dataset and to identify basic relationships between financial performance and ownership factors. The role of home country economic freedom emerges as a key factor, and operating margin emerges as a consistent dependent variable. Study three establishes the final analytical structure for the thesis.

Phase 5. The results of the quantitative study are consolidated, and policy

Table 1.1 describes the five phases of the research process undertaken in this study.
Chapter Two

Literature Review

The purpose of this chapter is to present the background knowledge related to this study and also to provide an overview of current research. Research on the impact of ownership and of changes in ownership of airlines is very limited. Eckel Eckel and Singal (1997) identified a fall in competitors' share prices of 7% in response to the privatisation of British Airways in July 1987, suggesting that the change from government to private ownership generated both economic efficiency and heightened competitive responses. The research is useful in that it attempted to control for broad changes in the industry environment and thereby isolate the particular impacts of the ownership change.

The British Airways privatisation was an early transformation of a large European state-owned airline to a stock market listed business, and formed part of the British Conservative (Thatcher) government's privatisation policy to rein in public debt (Elliott 2001). The significant trans-Atlantic competition between British Airways and listed United States based airlines provided Eckel et al (1997) with the opportunity to measure the privatisation impact on share price values. Meggison et al (1994) found strong evidence of improved firm-level economic performance in a study into the impact of privatising state-owned enterprises in both OECD and non-OECD countries. Not only did the performance of privatised former state-owned enterprises begin to resemble the performance ratios of private entrepreneurial companies (Meggison et al 1994:448), but this improved
performance was also found to occur even for non-competitive or regulated industries.

Returning to airline studies, Gillen et al (1989) identified a loss of productive efficiency from the state ownership of Air Canada of 23% of its total costs, primarily from an overexpansion of its capital stock. The impact of an airline's capital structure on its required operating margin is addressed in the research methodology in Chapter Six. Inefficient ownership structures, poor asset utilisation, and the operation of poorly performing network elements have the potential to seriously undermine the performance of an airline (Doganis 2002:164).

A major focus of the literature reviewed in this chapter is competitive strategy (Penrose 1959, Porter 1980, Mintzberg 1985, Barney 1991, Peteraf 1993) and the application of strategy theory to international aviation. Literature on strategy is abundant and, by variously addressing national, industry, and firm level factors, it provides a series of lenses through which to view the forces shaping decision-making in business generally and in the airline industry specifically. Strategic management does not rely on a single definition of strategy but rather requires a series of approaches considering the firm's internal resources (Barney 1991, 1995, Peteraf 1993, Priem and Butler 2001), the structure of the industry (Porter 1980, 2008), the intensity of inter-firm conflict (D'Aveni 1994, 1995, Brown and Eisenhardt 1997, Bourgeois and Eisenhardt, 1998), the application of game theory (Dixit and Skeath 2004, Nalebuff and Brandenburger 1996) and the complexities of market entry (Yoffie and Kwak 2002).
This research draws on Porter's (1980) generic strategy framework to explain the two business models that are adopted in international aviation, and this model is developed in Chapter Three. Full service airlines delivering global networks with a differentiated product, and low cost airlines providing low fare/best cost operations within relatively narrow regional markets are the current dominant business models for airlines. The Porter (1980) generic strategies have been extensively reviewed in the literature (see Hill 1988, Karnani 1984, Murray 1988, Oliva, Day, and MacMillan 1988 for a range of perspectives).

Rumelt (1979:196) describes strategy as 'problem solving of the most unstructured sort', and argues that strategy is strongly contextual. That is, the focus of strategy is the interaction of the organisation and its external environment, and the ability of its managers to make sense of the competitive landscape in which they are operating (Azaddin 2008, Nadkarni, Herrmann, and Perez 2010).

The global nature of aviation requires airlines to leverage their capabilities and resources in the international environment, to deal with the velocity of the industry (Nadkarni and Narayanan 2007), as well as to address the limitations imposed by their host country (Tallman 1991, Tallman and Fladmoe-Lindquist, 2002). Lengnick-Hall and Wolff (1999:1112) sought to define the 'core logic' of each branch of strategy, positioning the principles and premises of various strategy models against Rumelt's (1979) four tests for effective strategy theories. Rumelt proposed:
• a goal consistency test that requires a theory to specify primary goals and to avoid inherently conflicting objectives.

• a frame test that requires a theory to distinguish important from unimportant factors and to define critical sub-problems that must be resolved.

• a competence test that requires a theory to offer ways to use organisational skills, resources, and competencies to resolve critical issues, and

• a workability test that requires a theory to provide a reasonable expectation that desired results can be achieved if the theory is applied appropriately.

Lengnick-Hall and Wolff’s (1999) logics (capability logic, guerrilla logic and complexity logic), are used as a framework in this chapter to consider the approaches to strategy taken by airlines. The industry includes traditional full service airlines that achieve financial success leveraging superior resources to deploy their traditional business model (capability logic), and new entrant low cost airlines that have achieved financial success through aggressive entry to regional markets with lower costs and pricing (guerrilla logic). The emergent behaviours of complexity logic are less suited to the airline business with its underlying regulatory and network structures. In addition to defining firms by their core logic, the Porter (1980) generic strategies are employed in Chapter Three to describe the industry structure, to consider the range of business models applied, and to map the evolution of these business models over time.

Debate between academic authors has addressed the question of the relative importance of firm and industry factors in firm performance. Rumelt (1991) posed the question ‘how much does industry matter?’ The debate has continued (Gersick 1991, Coyne and Balakrishnan 1996, McGahan and Porter 1997, Hawawini, Subramanian, and Verdin
2003), with McNamara, Aime and Vaaler (2005:1081) affirming the earlier findings of Rumelt (1991) and McGahan and Porter (1997) that firm effects are stronger than industry effects in predicting profitability. Hawawini et al (2005) confirmed that firms stuck in the middle, rather than at the upper or lower ranges of performance, are less impacted by industry factors than their outlying peers.

While academic authors tend to offer each new strategy perspective as a stand-alone approach, practitioners tend to blend and merge the perspectives as they attempt to understand the competitive environment in which they operate. Boundaries between approaches mean little to managers focused on maximising the outcomes of their business rather than separating the conceptual lenses of competing academic theories. Various authors have addressed both the integration of theory (Brown and Eisenhardt 1997, Teece Pisano and Shuen 1997), and its differences (Stacey 1995, Lengnick-Hall and Wolff 1998, McDaniel 1997).

In an effort to provide an overview and structure to analyses, Teece Pisano and Shuen (2000) clustered strategy theory into three paradigms through which to consider research and practice:

- competitive forces – industrial organisation theory,
- resource based view, and
- strategic conflict – game theory.

Current streams of research on strategy can be traced to Edith Penrose's (1959) *Theory of the Growth of the Firm*, which established the basis for the current Resource Based View. Penrose viewed the firm as a 'bundle of resources' (Buckley
and Casson 2007:153), and identified the conflict between wealth maximising activity and the pursuit of growth driven by other objectives including by the performance targets of management (Buckley and Casson 2007:154). Examples of this behaviour can be seen in the pursuit of rapid growth at airlines that are not achieving break even operating performance, let alone delivering a return on capital employed (Flint 2011).

Discussions of the difficulties of developing and sustaining competitive advantage can be found in much earlier institutional economic research, such as Veblen's (1908:117) discussion of the difficulties of compounding and sustaining competitive advantage and intangible capabilities through the business cycle. The effective allocation of resources, the role of experience in shaping subsequent decisions, and the idea of continuous but constrained growth are developed in Penrose's work, and can be found in subsequent research in each of the strategy streams.

This Chapter is divided into six sections to provide structured contrast between the various perspectives of the strategy literature, and to address the relationship of competitive strategy theory to the practise of competitive strategy in the airline industry. Competitive forces, industrial organisation theory and the strategy literature addressing industry-level performance are reviewed in Section 2.1. Firm level strategy and the literature addressing competencies and capabilities of the firm are addressed in Section 2.2. Literature related to national advantage and global strategy is addressed in Section 2.3, after which the interaction and paradoxes of the strategy streams is addressed in Section 2.4. Literature related to innovation and constraints on innovation is explored in Section 2.5. The
underlying argument between classical economic and neo-classical economics is addressed in Section 2.6

This structured approach to the literature narrows the theory from industry to firm level issues, before considering the impact of a firm's host country on its outcomes. Some paradoxes in the theory are addressed before the responses of firms to their situation through innovation is addressed, leading to the literature discussing the motivation to maximise (or not) profitability.

2.1 Competitive forces

2.1.1 Firms in equilibrium

For firms that are established in a market, there is compelling logic to adopt strategy settings that are equilibrium-oriented (Levy 1994). For the airline industry, the firms most likely to seek equilibrium strategy settings are the legacy full service network and national flag carriers looking to sustain prior investment in their complex hub-based networks and traditional distribution channels. Hamel and Prahalad (1990, 1994) note that an equilibrium orientation does not imply that the marketplace is unchanging, but rather that the changes are engineered by incumbents to reinforce a desired competitive position in that market. Planned and predictable market conditions reflect linear and predictable relationships. Numerous authors (Prahalad and Bettis 1986, Reed and DeFillipi 1990, Barney 1991, Peteraf 1993, Conner and Prahalad 1996, Foss 1996a, 1996b, Priem and Butler 2001) address the concept of the firm defending its distinctive resource advantages in an approach identified as the resource-based view of the firm.
(RBV). This defensive approach calls for strategy as a plan of actions to protect the business from new entrant market incursions.

Mintzberg and Waters (1985) propose that when developed as a plan, strategy represents a deliberate and consciously intended course that shows a consistent pattern in a stream of actions, whether intended or not. Mintzberg and Waters also point out that the mere existence of a plan does not automatically lead to its realisation, and that the development and planning must include an approach to implementation. For several successful airlines including Singapore Airlines and Lufthansa, the executed plan has been to enhance both the physical product and the network strength of the airline in the face of growing low cost competition in their home countries. Both airlines invested in or acquired nearby competitors to reduce competitive pressures and to expand business scale.

For Lengnick-Hall and Wolff (1999), the literature argues that competitiveness is a function of the strength of the firm and the quality of its resources. The firm tries to develop and deliver its product or service more effectively than its competitors and pursues a future where it sees a sustainable advantage. Further, firms in stable industries look to blend capabilities in ways that are more difficult for competitors to copy, producing heterogeneous outcomes (Barney 1991, Peteraf 1993).

Strategy development for firms relying on capabilities is likely to be path-dependent. The organisation’s history, structure, and its business culture shape and influence decisions about the future (Chandler 1962). Path dependent firms are identified as heterogeneous and their differing capability positions are seen as somewhat ‘sticky’ (Teece Pisano and Shuen 1997). This means that firms are limited in their options by their current resources and capabilities. Definitions of path dependence range from Sewell’s (1996) broad perspective that ‘an event at an earlier point in time will affect the possible outcomes of events occurring at a later point in time’, summarised by Liu (2009) as ‘history matters’; to Levi’s (1997) tighter definition that, once started down a track where the costs of reversal are high, institutional arrangements will obstruct that reversal.

Airlines face this risk when committing to fleet decisions (Taneja 2008:83). Once an aircraft type is ordered, the related training, maintenance, and support equipment investments make reversal difficult and expensive. Liebowitz and Margolis (1995) distill this idea further, suggesting that only ‘remediable path dependence’ is of theoretical significance, since if firms made the best possible decision with the information available at a point in time they were acting efficiently. That is, if there are
no ‘feasible’ improvements to be made now, the firm’s position should be considered non-remediable. It seems inconceivable however, that faced with the consequences of a sub-optimal earlier decision, a firm’s management would not work towards finding some feasible improvement. Wishing to have made a different decision with the benefit of hindsight does not condemn the earlier choice made with the best available information at the time. Deferring decisions waiting for more information to refine the decision however risks paralysis.

Teece et al (1997:515) summarise equilibrium focus effectively. Firms in this strategic position are ‘bound and influenced by their past choices rather than driven by an impetus to reshape the competitive landscape’. Nonetheless firms need the ability to renew their capabilities and to innovate as the business environment changes. Those looking to reconfigure the business and to be sensitive to emerging opportunities are seen as adopting a Dynamic Capabilities approach (Schreyögg and Kliesch-Eberl 2007, Cohen and Levinthal 1990:137). The use of acquisitions, identified by Karim and Mitchell (2000) as a method to allow firms to break out of this historical constraint or ‘path dependence’, is often closed off to airline flag carriers by the complex ownership requirements linked to international traffic rights access.

Lengnick Hall and Wolff (1999:1112) summarise the capability logic position by focusing on the firm’s use of its existing skills and competencies to build its future competitive advantage. They state that:

"...capability logic rests on the selection, development, enhancement, and exploitation of a deliberately chosen set of elemental, building-block competencies and assets that are isolated from imitation and appropriation by competitors. Structures and systems are designed to nurture, protect, and exploit
The key capabilities and resources in ways that enable a firm to create a deliberate, path-dependent future to achieve a sustained competitive advantage.

The cost and complexity of building a full service network airline provides a barrier to entry to the highly differentiated globally-positioned generic strategy position that is adopted by many of the traditional national flag-carriers (Porter 1980). This barrier to entry reinforces the adoption of the capability logic position by these airlines, limiting the opportunities for imitation or appropriation of the business model by new entrant competitors. Airlines based in the Middle East (particularly the United Arab Emirates and Qatar) provide examples of new entrants that have entered a differentiated market position with broad network ambitions, but have only achieved this with very large scale capital investment, and with government shareholders prepared to sustain continued growth despite poor profitability (Flint 2011).

2.1.2 Path dependence for ASEAN airlines

The capability logic position relies on sustaining the existing competencies and advantages of the airline. Traditional network carriers and in particular state-owned ASEAN flag carriers are arguably bound by their historical roles of national development and technology transfer (Bowen 2000) and even the requirements of the 'iron rice bowl' (Ding et al 2000) in meeting expectations of social responsibility.

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2The 'iron rice bowl' in post-revolution Chinese state-owned firms, was identified by Ding et al (2000) as a major obstacle to reform in China, where these older firms tended to have higher employee levels and more traditional views of social responsibility, suggesting that at least in the Chinese/Confucian context, established firms were slow to respond to changes in social regulation within a competitive marketplace.
While many developing and transition economies have embraced the privatisation of state firms, airlines in Southeast Asia have for the most part remained (significantly if not fully) in the hands of state investment vehicles. Peng (2000) notes the lingering impact of the state even in ‘reformed or corporatised’ firms in transition economies, and suggests that expecting privatisation to deliver a business that automatically performs like private firm is naïve. The outcomes of airline privatisations in Southeast Asia support this assertion, with Malaysia Airlines returned to majority state ownership after losing RM8 billion following its sale to Tajuddin Ramli (Malaysia Today 2011), Philippine Airlines poor profit performance after its sale to Lucio Tan (ABS-CBN 2010), and the slide in Garuda’s share price after its 2010 initial public offering (Business Spectator 2011).

The report of the panel of experts appointed to review the 2009 state-sponsored bankruptcy restructure of Japan Airlines offers a further example of a privatised state airline that remained constrained by its earlier culture, unable to reshape labour costs or rationalise its network and fleet.

_The airline was often limited in taking reform action by the country’s rigid labour laws and job-for-life culture. Bankruptcy restructuring will reportedly enable it to shed more than 19,000 jobs by March 2015, far more cuts than were ever contemplated in recent years_ (ATWOnline – August 20, 2010).

Thai Airways public debate with the Thai government over loan guarantees in 2009 provides another example of a partly privatised airline still deeply aware of the wishes of the state (Bangkok Post 2009). Despite 49% of the company’s shares being held by private and institutional investors, many of them financial institutions, the financial plans for the airline were solely dependent on the sanction of the state treasury. This transfers key decisions in a large commercial venture from the firm’s executive team.
that are intimately aware of the business dynamics to politicians and bureaucrats less likely to understand the commercial drivers of the industry. In this situation, the risk arises of politically useful rather than commercially driven decisions being taken.

Regulatory barriers, the scale of capital investment, the longevity of aircraft, the protection of scarce airport slots, the maintenance of core networks, and even the seasonality of schedules, combine to render airlines’ capabilities particularly ‘sticky’. Sticky capabilities are those that can be identified as generalised across a firm or even an industry, but that are not readily transferable, at least in the short term, meaning that airlines tend to have to work with what they have, and not what they see in others (Teece et al 1997, Chao 2011).

Little short-term flexibility exists to change fleet structure or amend route networks, but where opportunities arise, knowledge of markets and fleet capabilities are critical to effective responses. This situation leaves low cost entrants free to attack the legacy operators who are, in their path dependence and their institutional engagements, fighting to defend their hard won network structures and resources, but also unable to meet low cost carrier unit costs and pricing.

2.1.3 Disruption

New entrants are more likely to attempt to reshape the rules for competing, since they lack the resources, knowledge, or experience of existing competitors. The new entrants are not embedded in path dependent positions, but are also unable to embrace some sticky capabilities of the full service incumbents (Chao 2011). Generating a temporary
advantage from unpredictable and fast changing market conditions is core to the idea of hypercompetition. Authors (D'Aveni 1994, Collis 1994, Chakravarthy 1997, and Eisenhardt 1989a) identified in hypercompetition the role of high-velocity strategies and frequent tactical actions to keep competitors unsettled. Lengnick-Hall and Wolff (1999:1112) describe this approach as ‘guerrilla strategy’ where

...disequilibrium and perpetual, discontinuous, radical change ensure that competitive advantages are temporary. An effective strategy destroys a firm’s own current advantages along with those of competitors. The purpose is not to do familiar things more expertly or to leverage existing assets as a capability logic recommends.

For guerrilla strategists any advantage is considered fleeting, entrepreneurial biases and the ability to reassemble capabilities in different ways are the core competencies (Lengnick-Hall and Wolff 1999). Rather than adopt path dependent behaviours, these firms eschew history, tradition, and loyalty, embracing risk rather than avoiding it. Effective competition depends on aggressive actions and opportunism. D’Aveni (1995:45) even asserts that ‘Laws that protect ‘fair play’ are not the models for the future of competition’. Airlines have seen changes in information technology reshape distribution, aircraft innovations redefine product offerings, and the first stages of deregulation shift the emphasis of business models towards aggressive low cost entrants. For the full service incumbents the response has generally been to defend existing capabilities, for the new entrants it has been to find ways of making those capabilities less relevant or effective.

2.1.3.1. Strategic inflection points – inside the industry

Grove (1999) identified the role of strategic inflections (dramatic shifts in technology or capabilities) on reshaping the competitive landscape within
industries. Aviation faced these periodic major shifts, both from endogenous and exogenous forces. Commercial jet aircraft were an early technology driven inflection point, with subsequent ones often driven by regulatory liberalisation or by supplier innovation such as Global Distribution Systems (McDonald 2011). New aircraft and engine technologies revolutionised the cost and convenience of air travel through more fuel efficient and longer-range jets. Regulators opened markets to multiple carriers removing the duopoly markets that characterised early bilaterally negotiated route access, and governments privatised airlines and airports establishing an emphasis in the industry on servicing the cost of capital, at least in the privatised firms. This is evidenced by the increasing focus of IATA on industry level economic performance (Pearce 2009, Ng and Seabright 2001).

Information technologies revolutionized distribution, firstly through computerised reservation systems in the early 1970’s, secondly through travel agent connectivity in global distribution systems (GDS) that consolidated the role of FSNC around major hubs, and thirdly though the emergence of Internet selling from the late 1990’s that enabled the entry of low cost carrier competition with direct and inexpensive access to customers.

2.1.3.2 External inflections – disruptors

Additional inflection points come from major external impacts including oil price shocks, terrorist attacks, and pandemics. These external shocks have been prevalent in recent years, with the industry facing the 1997 Asian financial crisis, the 2001 World Trade Centre attacks, SARS in 2003, the rapid escalation of oil prices in 2007-08, the Global Financial Crisis (GFC) in 2009, and the Swine flu pandemic inside of twelve years. Increasing focus on environmental issues, and the
associated taxation of compliance regulations, is adding to the external pressures on air carriers, and this will intensify as European governments increase taxation on carbon intensive travel.

2.1.3.3 Inflection impacts

The impacts of strategic inflections manifest in different ways. Massive external events such as the World Trade Centre bombings in New York and the Global Financial Crisis have immediate impacts. Demand falls steeply, and airlines respond with a mixture of price discounting and where possible capacity reductions. The concept of stickiness, introduced by Keynes (1936) in the General Theory of Employment Interest and Money arguably applies similarly to airline capacity. The scope for capacity cutbacks is limited, at least for FSNC, by the need to sustain the core connectivity of the network and to protect vulnerable landing slots at congested airports that usually require a slot to be used for 80% of the days in a schedule season to preserve grandfathered rights3. This situation sets the scene for airlines to persist with excess capacity and to engage in aggressive discounting where the downshift in demand meets the ‘sticky’ (Keynes 1936, Wells 1985) supply of seats. Tactical responses to periods of downturn tend to favour the LCC operators who capture price sensitive customers and whose networks (without the need to retain hub connectivity) are more flexible and adaptive (Lawton 2003, Douglas 2005).

3 Airport curfews and fleet constraints limit commercially viable timings for some routes. Grandfathered rights are landing rights at congested airports that were allocated to an airline at a prior time, and that are retained by that airline provided that the rights continue to be exercised. Grandfathered rights permit schedule stability over time. Stability may not be achieved if airlines were compelled to regularly re-apply for landing slots.
While external impacts are quickly visible, internal inflection points take time to wash through the industry, and are unlikely to appear as spikes in annual performance. Aircraft have 20 year working lives. Some 70% of the aircraft currently flying are out-of-production types. Less efficient aircraft generally remain in operation while the capital cost of their replacement outweighs the performance penalty of their inefficiencies (Derber 2010, Baldwin 2011).

Distribution innovations require a transition from traditional relationships and the re-education of customers as airline and third party websites, (and more recently social media), have taken an increasing role in airline marketing and sales.

The implementation of global distribution systems (GDS) in the early 1990s and the later shift in emphasis to Internet distribution progressively reduced the roles of call-centres and ultimately of traditional travel agencies in the distribution value chain. IATA’s value chain study (2004:1) identified the GDS suppliers as the strongest suppliers in the airline value chain, capturing an average return on capital in excess of 20% (5 times that of the airlines they serve), and enjoying a volatility in returns that is half that of the airlines. The distribution changes evolved over several years rather than in a single sharp shock, and as each innovation washed through the industry it favoured some firms more than others. Global alliance partnerships were the full service network carrier response to the development of GDS, but have evolved as a tool to leverage network connectivity and rationalise operations (Mullaney 2005). Access to GDS distribution was expensive and of little use to the LCC segment that bypassed the technology and moved directly to more cost effective Internet selling, saving the $6-$8 per flight segment levied by GDS for bookings (Mullaney 2005). While FSNC are able to provide a website sales channel, more complex itineraries with connecting flights
and multiple airlines are more difficult to offer online, and leave an ongoing commitment to traditional channels.

The third strategy paradigm addressed by Teece et al (2000) is strategic conflict that can be found in a game theory approach. Lengnick-Hall and Wolff (1999) frame this paradigm as ‘complexity logic’ where strategic consequences are no longer seen as the result of deliberate intent (Hamel and Prahalad 1990), but rather as emergent patterns of action that have little durability and flow from the constant rearrangement of resources and firm structure. The environment is dynamic, and it is possible to reach the firm’s desired outcome by more than one course of action (Miller 1990, Hamel 1998). This perspective is the antithesis of path dependence, because it views ‘values and vision’ as constraints on the firm rather than drivers (Lengnick-Hall and Wolff 1999). The authors argue that, ultimately, the development of strategy from a complexity perspective is bounded only by the culture of the organisation and its human capital.

The paradoxical relationships that complexity logic suggests can be seen in the emerging maintenance collaboration between Southeast Asian low cost competitors Air Asia and Jetstar-Asia, and also between LCCs and FSNCs who might otherwise be seen as aggressive competitors including All Nippon Airways’ potential link with Air Asia. This situation confronts firms with a dilemma. Rather than adopting capability logic to preserve competitive advantage and brand recognition, the airline is faced with a partner looking to cannibalise and destroy existing market conditions, overturing the firm’s strategic orientation (Romanelli and Tushman 1994).
The strategic orientation of firms using guerrilla logic (Lengnick-Hall and Wolff 1999) requires actions to stay ‘one step ahead’ or potentially to ‘leapfrog’ competitors, not to mount defences of existing capabilities. Despite the potential for conflict, capability logic, complexity logic, and guerrilla logic have some principles in common. Firstly, both capability logic and guerrilla logic argue for the importance of following a deliberate, controllable strategic intent (see Hamel and Prahalad 1994, D’Aveni 1994). Secondly, both capability and complexity logics recognise the value of long-term, self-sustaining partnerships and alliances (Barney 1991, Moore 1996), with reciprocity, continuity, and commitment seen as important assets from both perspectives. Guerrilla logic, on the other hand, emphasizes the liabilities of intimate and intricate connections that are common in the alliance relationships of established airlines (Chakravarthy 1997) and looks for opportunities to build advantage, at least in the short term, by disruptive actions.

2.2 National advantage and global strategy

Classical economics views the economy as a single unit (Arnsperger and Varoufakis 2005). Traditional theories of international trade build from Adam Smith’s (1776) anti-protectionist absolute advantage theory, where self-interest, competition and specialisation allow countries to build an absolute advantage in specific products. Countries should then engage in the production of goods where they hold an absolute advantage.

David Ricardo’s (1817) similarly anti-protectionist comparative advantage theory proposes that even where a country is unable to sustain absolute advantage, the country should focus on producing those goods that they can produce most efficiently. Porter’s
‘Diamond of National Advantage’ (1990) develops this argument further by proposing that a country can create its own factors such as a technology base or skilled workers. Further, Porter argues that the existence of local disadvantages in key factors of production can force innovation by companies looking to overcome resource or skill shortages, opening the possibility of new methods building new comparative advantage.

Neo-classical economics (Aspromourgos 1986) in its pure form relates supply and demand to an individual’s rationality and his or her ability to maximise utility or profit. This approach to economics is criticised (Leontief 1973, Coase 1991) for the narrow assumptions and abstract disconnection from the functioning environment that is embodied in the equations used in studies. The complexity of the business environment is not always readily captured in the limited range of factors capable of being addressed in a model’s assumptions.

In the broader perspective of ‘new institutional economics’ Coase (1998) includes other factors important to studies, including organisational structures, enforceable property rights, transaction costs, governance, legal enforcement mechanisms, asymmetric information, strategic behaviour, bounded rationality, opportunism, contractual safeguards, incentives to collude, hierarchical structures, and bargaining strength. North (1995:359) offers a useful separation of institutions and organisations describing institutions as the "rules of the game", both the formal legal rules and the informal social norms that govern behaviour and structure social interactions in institutional frameworks. North (1995:360) sees organisations as groups of people and ‘their governance arrangements they create to coordinate their team action against other teams performing also as
organisations' and sees the conditions for economic efficiency as impossible to achieve in political markets.

The underlying message of North's writing, and its inherent criticism of neo-classical economics is the idea that it is impossible to find markets devoid of bargaining strength or transaction costs, and that these factors will shape the perceptions around economic payoffs.

2.3 Interactions

2.3.1 Dynamic environments
The business environment is not static (D'Aveni 1995, Arthur 1990). Changing business conditions as well as some fundamental contradictions among key elements of each strategy perspective confront managers and corporate strategists. Mintzberg (1992) notes that the strategy planned is not always the outcome executed, but that, regardless of other uncertainties, it is important for the firm to understand its context and to keep its internal and external positions aligned. Shifts in technology, regulation, and ownership, as well as falling barriers to entry have required airlines to shift their business models to maintain consistency between their strategy and their context. This shift does not come easily to large established businesses, particularly where there is a significant level of government involvement. Airlines must overcome structural and competitive inertia and path dependent organisational momentum to sustain competitive advantage.
2.3.2 Absptive capacity and path dependence

Cohen and Levinthal (1990:129) describe absorptive capacity as the ability to identify the value of new external knowledge and information, to assimilate it, and utilise it to meet new commercial objectives. The capacity to adapt to a changing business environment is seen in the context of the firm’s prior knowledge and experience, and posits that each firm is likely to have a unique capacity to learn. The ability of FSNC to adapt to change, and the motivation of LCC entrants to engage in guerrilla strategies to unsettle established competitors, shapes the current airline landscape. This component of organisational culture is addressed in the following section.

2.4. Strategy models and an institutional environment

In the previous section, the core research streams of strategic management were positioned within the Lengnick-Hall and Wolff (1999) core logics, and these logics were applied to provide different perspectives of and explanations for the decision-making actions of firms within an industry. The wide range of models and frameworks developed in the core strategy streams generally describe the actions of firms addressing the dual challenges of profit maximisation and sustained competitive advantage in their industry sector.

The airline industry with its regulatory constraints and continuing significant state ownership elevates the impact of institutional factors amongst the challenges of strategy formation and business optimisation. According to Oliver (1991, 1997) this institutional
extension of the focus of the firm shifts resource advantages away from sustaining competitive advantage, and towards managing its relationship with its context.
‘...behaviour extend(s) beyond economic optimisation to social justification’ (Oliver 1997:699). DiMaggio and Powell (1983) identify the tendency for firms in the same sector to exhibit similar behaviours and structures when faced with the same pressures from governments or partners. They suggest that larger and older firms can reach the point where they dominate rather than adjust to their environments. Oliver (1997:710) further identifies the weaknesses of an institutional capital focus as resulting in ‘stagnant cultures, management loyalty to outdated traditions, and vested interests in the status quo’, and he points out that firms that are captives of their own histories can make sub-optimal resource decisions where imitation of success factors of others ‘lack legitimacy or social approval’ (Oliver 1997:700).

Peng (2000) and Peng and Luo (2000) identify the role and importance of interpersonal and institutional linkages for privatising firms in transition economies, and the difficulties that these firms have in separating from politicians and bureaucrats previously accustomed to making resource allocation decisions (Peng 2000:107).

National flag carriers in ASEAN countries are predominantly government owned, either directly or through stakes held by government investment corporations. Where partial privatisation of airlines in the region has taken place, strong links remain to national governments (Bowen 2000). Several airlines, including Garuda Indonesia, (privatised in 2010) Philippine and Malaysia Airlines, have faced major restructuring in recent years. Others such as Thai International have variable profit histories despite strong traffic flows, strategically advantageous geographic locations, and access to low cost labour.
Historically, governments in the region have given exclusive operating rights to national flag carriers, though some limited second tier carriers were operating in Thailand, the Philippines, Indonesia and Malaysia before the economic disruption of the 1997 Asian financial crisis.

2.4.1 Disruptive competition

The hard-to-replicate scale and networks of the incumbent established flag carriers would likely see them adopt the Lengnick-Hall and Wolff (1997) capability logic position, and exhibit path-dependent relationships (Dierickx and Cool 1989, Waldrop 1992). Conversely, the new entrant low cost competitors will move to deliberately disrupt established processes, positions, and regulation (D’Aveni 1994). The established airlines have built webs of interdependence within and across organisational boundaries that become ‘institutionalised patterns of culture, norms and ideologies’ and contribute to organisational inertia (Tushman and Romanelli 1985:177). Shifting from a capability logic to a guerrilla logic to compete with new entrants on their own terms would require the institutional impediments to change to be replaced with a culture where relationships are based on transactional exchanges and short-run benefits (D’Aveni 1994, Kim and Mauborgne 1997).

2.4.2 Institutional cultures

Institutional cultures built into Southeast Asian airlines are not surprising given the key economic development role these companies were given. Responsibilities included establishing technical capabilities, promoting tourism, and supporting international trade on top of providing essential transport links. Heavy investment in airport
infrastructure supported the development of hub and spoke airline networks as nations strove to gain an edge in tourism and air travel markets (Bowen 2000).

Williamson (2000) maps four levels of social analysis to describe institutional economics. The highest level (embeddedness), addresses informal institutions, customs, traditions and norms. Changes at this level are slow and rarely deliberative (Williamson 2000:97). Below the embedded level falls the institutional environment, specifying the rules of the game for the bureaucracy and codifying the economics of property rights. Drawing on Coase (1960), Williamson argues that, where property rights are not assured (eg Thailand or China), it is difficult to move forward from writing the rules of the game, to playing the game by aligning governance structures with transactions.

Gwartney's (2009) analysis of the Economic Freedom of the World database identifies constraints on economic performance, and supports the contention, that 'a legal system that protects property rights and enforces contracts in an even-handed manner is vitally important for the achievement of a high level of per capita income' as these conditions are essential for realising the gains from investment and commercial exchange. Scott (1997) identified the importance of clarifying the contrasting roles of deregulation and government investment in leading growth and development in emerging economies. Williamson's (2000) cascading relationship finally sees resource allocation able to be achieved at the fourth level along the lines of neo-classical economics, with rational profit maximising choices the expected outcome.
2.4.3 Transaction costs

Coase (1960) identified the impact of transaction costs on rational decision-making, and the relationship between institutions and neo-classical economics. Coase argues that only where there is costless bargaining (that is where no transaction costs or external factors impact the negotiation) will the actors reach an outcome of maximised aggregate income, regardless of the institutional conditions. In essence, a condition of costless transactions is required for neo-classical markets to function effectively. North (1994:360) underlines the difficulties of achieving this costless bargaining outcome that requires not only efficient transmission of all the relevant information, but also actors that have clear objectives and understand the process required to achieve them. North (1994:360-361) notes that

_Institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve those with the bargaining power to create new rules. In a world of zero transaction costs, bargaining strength does not affect the efficiency of outcomes; but in a world of positive transaction costs it does._

International institutions have played a key role in the development of air transport since the Convention on International Civil Aviation, generally known as the Chicago Convention (ICAC 1944). Trading bilateral traffic rights in air service agreements was essential for the growth of international aviation, and with the establishment of national flag carriers in Southeast Asia, for the growth of Asia's hub airports. Ensuring access to hub connecting traffic through bilateral traffic rights negotiations can be traced back to the ASEAN economics ministers meeting of February 1979 (ASEAN Secretariat 1979), where concerns with possible exclusion from Australia-Europe 'low fare' pricing was addressed.
[The ministers] agreed on the following principles for negotiations on the
Australian International Civil Aviation Policy; (Press Release: The Special
ASEAN Economic Ministers Meeting, Kuala Lumpur, 22 February 1979, Part 5)
(a) The ASEAN airlines should be allowed to participate in the new low
fare scheme between Australia and Europe with or without stopovers in ASEAN
countries. There should be no reduction in the present capacity of ASEAN
airlines. With the reduction in fares, there is likely to be an increase in traffic
which necessitates extra capacity. In order to enable equitable participation,
such increase in the capacity would initially be taken up by the airlines of
Indonesia, Malaysia, the Philippines and Thailand.
(b) The new Australian ICAP low fare scheme would not be viable for
participation by the national airlines of Indonesia Malaysia, Philippines and
Thailand because of their present limited capacity and landing rights. To
overcome this, ASEAN should:
(i) seek stopover rights at reasonable surcharge based on the 10% proposed
by Singapore; and
(ii) obtain additional landing rights.
(c) It would be necessary for the ASEAN countries to act collectively in their
negotiations with Australia as well as other countries to secure better landing
rights for the ASEAN airlines in general.
(d) The Meeting agreed the proposals on the ASEAN - Australia fares in the
Singapore working paper be used as a basis for computing these fares.

Over the succeeding years ASEAN airlines participated strongly in the 'low fare'
market between Australia and Europe, leveraging their resource advantages of
geographic location, low labour costs, and expanding networks to ultimately replace the
European carriers on the route. Low fare pricing approaches to 6th freedom traffic by
ASEAN airlines put downward pressure on yields and encouraged the European carriers
to seek more profitable use of their aircraft, since in the long-run, aircraft can be
redeployed to more favourable markets, and limited resources in outstations can be
disbanded at little cost (Holloway 2003:449).

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4The regulatory structure for international air services emerged from the Chicago Convention
discussions on 1944. 6th freedom traffic rights refer to an airline's ability to carry passengers
between two markets using its home base as a mid point. For example Japan Airlines could
participate in the Philippines – France market by combining its bilateral rights to carry
passengers between Japan and the Philippines with its rights to carry passengers between Japan
and France. The Chicago convention traffic rights underscore the factor advantage of
geographic location.
More recently the emerging state-owned network carriers in the Middle East have followed the same path to growth, tapping large 6th freedom opportunities between Europe and the Asia-Pacific region to grow at a pace that would not be supported by home country 3rd and 4th freedom markets. In 2009 Dubai-based Emirates airline was ranked as the world's largest carrier in terms of international seat kilometres flown (IATA 2011, MEED 2008). The United Arab Emirates, with a population below 5 million (World Bank 2009) serves as home base for both Emirates and Abu-Dhabi-based Etihad. Neighbouring Qatar, with a population below 1.5 million, hosts Qatar Airways, serving 100 destinations with a fleet of 96 aircraft and with 200 aircraft on order (Qatar 2011). Of these three carriers, only Emirates airline has reported positive economic results (Flint 2011).

State owners, apparently pursuing market growth ahead of financial return, have underwritten the rapid fleet and network expansion of Etihad and Qatar Airways. This level of investment would likely have been impossible to justify had a requirement for a short term return on assets been imposed on funding decisions.

2.5 Summary of the chapter

This chapter has covered background knowledge important to this study, addressing both seminal and contemporary literature on competitive strategy, neo-classical and institutional economics, the regulation of international aviation, and institutional theory. In the following chapter, this knowledge is applied to develop a framework that describes the international airline industry and provides a further structure for this research.
Chapter Three
An Industry Level Model

This chapter positions the airline industry within the Porter (1980) generic strategies, and maps the evolution of the industry within that framework. The role of technical and regulatory innovation in expanding competitive scope (Porter 1980:41) is contrasted with the role of business model innovation in expanding competitive advantage. Section 3.1 outlines competitive strategy and innovation theory in an aviation context. Section 3.2 describes the pre-deregulation industry structure with particular reference to the United States market prior to deregulation, before Section 3.3 addresses deregulation by geographic region. Finally Section 3.4 adapts the Porter (1980) generic strategies model to an industry specific framework.

3.1 Industrial organisation

The Porter (1980) generic strategies model provides a framework to describe differences between firms’ business models. Firms are categorised by their broad or narrow position in the market, and by their approach to the development and delivery of products and services. Porter (1980:5) defines an industry as ‘a group of firms producing products that are close substitutes for each other’. This definition leaves open arguments about the breadth of industry scope, and the
substitutability of products from what are arguably other industries, such as high-speed rail for air travel.

Tirole (1988:12) addresses this question with the view that a market should not be so narrow as to leave a single monopoly supplier, but should only be broad enough to allow a single description of the interaction between firms.

Despite the uncertainties around the definition of a market, the Porter generic strategies allow definitions of business models to be applied within a market, with firms either garnering market share through cost competitiveness or leveraging premium pricing through the superior features of their product. Dess and Davis (1984) found superior performance for firms deploying one of the generic strategies over those seen to be ‘stuck in the middle’ (Porter 1980:41, McDaniel and Walls 1998).

Australian carrier Virgin Blue in announcing its rebranding as Virgin Australia conceded that its hybrid position trapped between low cost airlines Tiger and Jetstar, and full service carrier Qantas was unsustainable (Knight 2011). The generic strategy theory identifies weakness in a confused or hybrid strategy where firms attempt to blend the features of more than one generic strategy position. The hybrid position has its defenders including Miller (1992) and Kim and Mauborgne (1999) who argue that new market space can be created by blending innovative differentiation with strong cost control. Kim and Mauborgne (2005) return to the hybrid strategy question, proposing that an industry can be reconstructed with a renewed value proposition.
The value proposition is maximised by raising customer utility (differentiation), while driving out costs by identifying product elements that customers do not value. This ‘differentiation with effective cost control’ (Kim and Mauborgne 2005) approach has arguably been followed by many profit-focused businesses including FSNC for many years (Pretorius 2008). Differentiation without effective cost control would in any case be inconsistent with a neo-classical profit-maximising objective. A firm, aiming to produce until marginal revenue equalled marginal cost, would have more scope for growth when its costs were contained (Keen 2004).

Considering a Cournot-Nash approach, where marginal revenue approaches marginal cost as the number of firms increases, Keen and Standish (2006) identify a potential increase in unpredictable output changes as industries fragment, but also find that, in competitive industries, firms appear to sustain a marginal revenue above marginal cost (2006:4). In either case, a focus on cost control allows firms to achieve lower marginal costs and provides opportunities to capture more demand. There is long run evidence of a focus on cost control in the airline business, with IATA (2006) finding that the unit costs of United States based FSNC remained unchanged in nominal terms over the period between and 1996 to 2004.

There is also evidence of the failure of airlines to successfully deploy hybrid strategies including the collapse in 1999 of Debonair, a ‘lower fare/full service’ model airline operating from primary airports in the United Kingdom (Doganis 2006:263), and the ‘lower fare/all business class’ model introduced to the East Coast Australia market by OzJet in 2006. Despite deeply discounted business class fares OzJet withdrew after viable loads could not be generated on its 30 year old fleet of Boeing B737 aircraft. Dorman (2006) notes that business class customers
are predominantly responsive to differentiated products and service, and
demonstrate relatively price inelastic demand.

Similarly, three all-business-class airlines entered the London-New York market in
2005 (Douglas 2010a) but failed to differentiate adequately to generate yields to
match the product cost, and failed once shareholder funds were exhausted. The
capacity of the Porter generic strategies to describe viable models for the airline
business is underlined by these examples, which demonstrate carriers caught in
the middle between value-based and differentiated positions. These business class
carriers achieved neither premium revenues nor cost or scale advantages.
Ultimately, with lower fare levels than their network competitors, they fell short of
covering even marginal costs (Douglas 2010a).

The potential for firms to sub-optimise was addressed by Tirole (1988:48) who
identified non-economic factors including ego, prestige, friendship and even the
span of subordinates managed, as factors that may unsettle a firm’s neo-classical
economic focus on profit maximisation. In aggregate, the airline industry
consistently fails the profit-maximisation objective, falling short of meeting even
its cost of capital, throughout the business cycle (David 2007, IATA 2008). Porter
(2008:85), describing the airline industry notes that:

*Years of airline price wars reflect these circumstances in that industry. Fixed
costs are high and marginal costs are low. This creates intense pressure for
competitors to cut prices below their average costs, even close to their
marginal costs, to steal incremental customers while still making some
contribution to covering fixed costs....Capacity must be expanded in large
increments to be efficient. The need for large capacity expansions disrupts the
industry's supply/demand balance and often leads to long and recurring
periods of overcapacity and price-cutting. The product is perishable.
Perishability creates a strong temptation to cut prices and sell a product
while it still has value.

A study based solely on neo-classical economic modelling would fail to capture the
non-economic factors driving airline industry decision-making. A new institutional
economics approach is more likely to capture the broader range of drivers of
economics the need to deal with 'feasible organisational alternatives' and to
recognise that market failures cannot reliably be remedied by 'omniscient,
onnipotent, benevolent governments'. Williamson subsequently addresses the
merits of privatisation (Williamson 2000:611), and while accepting that real
benefits accrue, states that they are

...not uniform and need to be assessed with reference to both the rules of the
game and the play of the game. The firm is variously described in
technological, contractual, and competence/knowledge-based perspectives.

This breadth of approaches, with its elements consistent with much competitive
strategy theory, allows bureaucracy and political factors to be considered
alongside efficiency arguments.

Adopting Porter's (1980) generic strategies as a framework, the evolution of the
airline industry can be observed from early its early niche position as narrowly
differentiated companies serving a small premium segment, to the competitive
blend of differentiated global full service operators and cost driven regional low cost carriers that form the current industry.

Fig 3.1 Airline industry business model innovation – described within Porter's (1980) generic strategies.

As technology evolved, airlines integrated technologies (e.g. jet aircraft, and computer reservations system) to expand from a niche market segment, to become broad market differentiated providers. Continued technology innovation (e.g. wide-bodied long haul aircraft) accompanied early changes in regulation to drive market expansion. The pace of product innovations (usually developed by external vendors and suppliers) and the pace of regulatory innovations (shaped externally by governments) determined much of the pace of change in the industry.
The development of global distribution systems in the early 1990’s to extend airline reservation systems into travel agent offices was an airline-driven innovation that in turn drove airline codeshare and alliances relationships (Oum Park and Zhang 1996). These innovations were designed to optimise an airline’s travel agent displays\(^5\).

Supplier innovations are readily dispersed to all competitors, and advances in reservations systems pioneered by American Airlines and IBM in 1960 (IBM 2011) were quickly adopted by competitors, while new aircraft types rapidly joined fleets around the world. Competitive advantage came from consistent evolution and early adoption of advances in technology such as longer range aircraft (Copeland and McKenney 1988). The performance of the airline industry is also addressed by Porter (1980) in the development of the five-forces model. Porter argues that the combination of substitute products, buyer and supplier power, and rivalry based on price competition keeps the airline industry’s profitability under pressure.

Revisiting the five forces model, Porter (2008) notes the sub-optimisation factors of ego and prestige raised by Tirole (1988) as reasons for airline owners staying in an industry with a history of economic value destruction.

In the immediate post war era price competition was eliminated by a cartel structure managed in international markets by the International Air Transport

\(^5\) Codeshare is the marketing of one airline’s flight number on a flight operated by another carrier. For example, Air France is able to offer connecting Air France flight numbers between Paris and Sydney by marketing its brand in a codeshare on a Qantas flight from Hong Kong to Sydney. Global distribution systems routinely prioritise ‘online’ connections between flights of one airline over ‘interline’ connections between flights of different airlines. An apparent online connection, achieved by providing one airline’s flight number on a partner’s flight, improves the visibility of the flights to travel agents.
Association (IATA) (Doganis 2006:30). Access to markets was constrained by
regulators to provide almost perfect barriers to entry. In an environment where
governments were seeking to define a value for air service access, many carriers
were owned by the same governments (Richards 2001). The United States airline
industry was free from government ownership, but was as tightly regulated and
constrained as other countries, with the Civil Aeronautics Board (CAB) controlling
both route access and pricing (Conklin, 1971). Market capacity and demand was
not always effectively balanced, and an excess of capacity in 1961 saw the industry
fall into losses with average load factors around 50% (Conklin 1971:40). Aircraft
were small and their range was limited. Until 1965/66 with the significant
technology innovation of the Boeing 727 and Douglas DC9 short haul jet aircraft,
air travel provided little competition as a substitute for rail journeys (Barnum
1998).

Markides (2006:19) separates ‘business model innovation’ that reshapes the way
companies compete in the same market space (offering the example of British
Airways risking alienation of its traditional distribution network if it adopted
online selling to compete with easyJet ) from ‘technology innovations’ that can
dominate the industry once widely taken up. Airline industry technology
innovations before deregulation were provided to an industry that preferred the
status quo, and resisted disruptive business model change (Barnum 1998).
Developments in aircraft and engine design provided incremental benefits to
airlines and their customers, and delivered an impetus to market growth. Each
innovation enabled airlines to improve service, often at lower cost, but each was
easily imitable and did not facilitate business model innovation (Markides 2006),
providing little opportunity for competitive advantage to a single carrier against its
peers (Douglas 2010a).

There is significant emphasis on ‘disruptive innovation’ in the literature (Christensen 1997, Christensen and Raynor 2003, Markides and Charitou 2004 Markides 2006). Christensen (1997) tends to provide a narrow focus on disruptive technologies compared with Markides and Charitou (2004) and Markides (2006) where broader business model innovation is addressed.

Christensen and Raynor (2003) argue that incumbent organisations can only embrace disruptive innovation by establishing a separate business unit, building on Christensen’s (2000:125) observation that the arrival of disruptive technologies can have a deadly impact on incumbent companies. Markides and Charitou (2004) identify four strategic options for firms facing disruptive innovation, and offer a structure for firms managing dual business models (units). The impact of the relatedness of markets and the intensity of internal conflict for are crucial factors for firms following this path.

The arrival of high speed rail in Europe offers an example. Fast rail journey times provided a substitute that lead to the withdrawal of most domestic flying in France, between Paris and Brussels, and much of the capacity between Paris and London, but did not change the core business model of the FSNC. Internet selling, which allowed dramatically lowered distribution costs, had a disruptive impact on the airline business model. Low cost airlines were able to distribute low fare point-to-point flights within the regional markets of Europe and Southeast Asia on their websites while full service network carriers remained locked into more expensive GDS distribution for their traditional hub and spoke networks. This provided a
significant cost advantage to the new entrant LCCs while FSNC were constrained in
their response by risks of conflict with their existing travel agent sales channels.

The regulated structure of the airline industry before the 1990s reduced
opportunities and arguably incentives to embrace disruption. Significant business
model innovation had to wait not only for privatisation and deregulation of the
industry in Europe and in the Asia-Pacific region, but also for enabling technology
before it could begin.

3.2 Pre-deregulation: Rigidity imposed limits on competitive
strategy options

Before deregulation the airline industry operated under oligopolistic or
duopolistic market conditions. Air fare pricing was rigid, with tariffs often enforced
by government agencies that embedded IATA price regulation into bilateral
aviation treaties, even for non-IATA member airlines (Doganis 2006:31).
International fares packages were routinely subject to bilateral government
approval before publication, and monitored by IATA to prohibit competitive
discounting (Doganis 2006:30). Capacity was tightly controlled under bilateral
treaties, and barriers to entry were consequently high.

Under the United States Civil Aeronautics Board pricing model, a single rate per
mile was charged for domestic airfare journeys regardless of the type of operation
or the journey length, and fare levels were managed to deliver a 12% return on
investment to airline companies (Vietor 1990, Barnum 1998). Given that many
journey costs are incurred in the airport departure process, there was an economic
incentive for regulated airlines to avoid regional flying and operate longer haul
flights where the diminishing unit cost was set against the single unit revenue on offer to the entire industry.

Carriers able to devote more of their network to longer flight stages were better able to extract profits (Barnum 1998). Any potential advantage to a single carrier could be offset by the Civil Aeronautics Board’s attempts to stabilise industry profitability by allocating new and more attractive route licences to carriers that appeared to need additional profit support. Requests by airlines to modify their networks or to move from, charter to scheduled operations were met with high bureaucratic barriers. Barnum (1998) notes

But when, for example, World Airways, a charter airline, applied in 1967 to fly a scheduled service between New York and Los Angeles at low prices, the CAB “studied” the matter for six and a half years and then dismissed the application because the record was “stale”.

Despite this heavy institutional imposition on the industry, some airlines were able to craft more effective and profitable strategies than others (Vietor 1990, Ramaswamy et al 1994, Borenstien and Rose 2007).
Figure 3.2 Pre-deregulation United States CAB regulated economic structure

3.3 Deregulation Opens Opportunities

Much of the research on airline market entry has studied the market entry and growth of short haul value-based carriers. (Brueckner 1994, Nero 1999, Chin, Hooper, and Oum 1999, Oesterle and Macharzina 2002, Steinrucken and Jaenichen 2004, Hooper 2005, Brueckner and Pai 2009). Barnum (1998) noted that no new trunk carrier entered the United States domestic market between 1938 and deregulation of the market in the 1970's, but that regional carriers were able to develop. In particular Barnum (1998) identifies California-based PSA and Dallas-based Southwest that were established under the intra-state rules beyond the CAB’s rigid controls, and that addressed price competition and volume growth rather than following the fixed fares and low load
factors of the regulated trunk carriers. Southwest, like Ryanair in Europe, suffered unprofitable early years before restructuring as a low cost operator and capturing the expansion opportunities of the deregulated market.

Parallels can be found in Southeast Asia, with Air Asia, that took over the shell of the eponymous failed Malaysian domestic carrier in 2002 and restructured the airline along the low-cost model. Each airline prospered by moving to a ‘focused best cost’ business model (Porter 1980) and capturing market share in a deregulating domestic/regional market. Both Ryanair and Air Asia limited the scope of their early head to head competition with their most powerful rivals. Yoffie and Kwak (2002) identify this avoidance of head to head conflict as the ‘puppy dog’ approach in judo strategy.

*In any kind of competition, your first goal is to stay in the game. So judo strategy counsels challengers to keep a low profile and avoid head-to-head battles that they’re too weak to win. This advice goes against the grain for many managers* (Yoffie and Kwak, 2002).

3.3.1 Approaches to deregulation

Airline deregulation began in the United States domestic market in the 1970's and has been extended by legislation throughout the developed economies of Europe and Australasia to provide open regional markets. By contrast, the pathway to ASEAN aviation deregulation comes without the binding force of a central legal system, with bilateral agreements still constraining market access, and with a substantial percentage of the region’s airlines state-owned or controlled.
3.3.1.1 ASEAN

ASEAN chose the aviation sector as an early candidate for the deregulation and economic integration process, and reached the first tangible milestone for passenger traffic with the limited opening of the intra-ASEAN capital city markets in December 2008. The Multilateral Agreement on Air Services signed in November 2008 sets out a gradual path of liberalisation 'with a view to building a single unified aviation market within ASEAN by 2015 (CAPA 2008). A precursor to this milestone was the opening of the busy and fiercely protected air route between Kuala Lumpur and Singapore to unlimited third and fourth freedom traffic in the second half of 2008, allowing services to be mounted by the low cost carriers of each country. While new entrant capacity was limited to a handful of narrow body services daily, most to the less convenient LCC terminal Kuala Lumpur International Airport, price competition was swift and brutal. Singapore's Tiger Airlines offered tax inclusive fares as low as USD10 one way in the formerly high yielding market, prompting an aggressive pricing response from Malaysia Airlines, accompanied by a reduction in capacity by Malaysia Airlines to narrow bodied aircraft and the substitution of Silkair to take over the route from its parent Singapore Airlines.

The reluctance of the Indonesian government to liberalise traffic rights into Jakarta while it restructured and privatised flag carrier Garuda was an early test of this easing of regulation (Bofinger and King 2006, Bofinger 2008). The air routes between Singapore, Bangkok, and Kuala Lumpur have seen a growing LCC presence since 2004. With the Singapore to Kuala Lumpur route now open to competition, the Singapore - Jakarta market is one of the few large city pairs inside ASEAN still facing traffic rights limits.
While ASEAN governments have endorsed a process of deregulation and economic integration (CAPA 2008), the consensus nature of ASEAN decision-making with opportunities for states to opt out of agreed positions, the lack of a central register of air service agreements, and the lack of a binding centralised ASEAN legal system, makes the deregulation process difficult and slow (Bofinger and King 2006, Bofinger 2008).

In Singapore in November 2007 the heads of government accepted the ASEAN multilateral agreement on air services, affirmed again by a meeting of ministers in Manila in May 2009 that offers closer and more binding co-operation. This multilateral agreement on air services, as ratified by member states, still falls well short of providing binding obligations or super-national institutions with legal force, but does open unlimited capacity on services between an airline's home territory and designated points in ASEAN, as well as full regional 5th freedom traffic rights, expanding to beyond ASEAN 5th freedom rights from December 2012. This beyond ASEAN expansion will require a more co-ordinated dialogue with partners outside the ASEAN region (Thomas Stone Tan Drysdale and McDermott 2008).

Opportunities for backsliding opened up in late 2008, with the Indonesian government qualifying its acceptance of the capital cities component of the air transport agreement by limiting access to Jakarta's main airport at Cengkareng (Bernama, November 15, 2008).

The Indonesian government had earlier moved to limit the growth of LCC operations to the country's major airports and in particular had blocked new
carrier access to the key Jakarta-Singapore route. The constrained capacity environment has seen frequencies previously allocated to Jetstar-Asia transferred to its Singapore-based rival Tiger Airways to allow double daily services for both airlines (Francis 2010).

Low cost airlines Air Asia and Qantas subsidiary Jetstar-Asia are showing strong growth in Singapore, Malaysia, Thailand, Indonesia, and Vietnam, but are forced to construct complex country-based ownership structures to deal with the existing regulatory framework (CAPA 2011, Fitzsimons 2011). Malaysia-based Air Asia consequently operates nation-based subsidiaries in Indonesia and Thailand with local equity partners, and Jetstar-Asia runs a part-owned subsidiary in Vietnam to access traffic rights. The cross-border subsidiaries overcome some constraints of the slow liberalisation process in ASEAN, but stand in stark contrast to Europe where airlines are free to launch intra-regional and trans-Atlantic routes based on market opportunity.

The Northeast Asian region, (including for this study China, Hong Kong, Macau, Japan, Korea, and Taiwan) is more fragmented than the ASEAN countries of Southeast Asia (Oum and Yamaguchi 2006, Bowen and Leinbach 1995), with the entire region relying on bilateral rather than regional traffic rights. The concept of a regional aviation block comprised of Japan, China, and South Korea has made little progress (Oum 1998, Oum and Lee 2002) leaving a regional structure comprised largely of FSNC. In Japan, and progressively in China and Taiwan, high speed rail is taking a dominant role in domestic transportation and this will contribute to a greater focus of the Chinese carriers on international services.
3.3.1.2 Europe

In contrast to Southeast and Northeast Asia; Europe, the United States, and Australasia matched easier market access with less stringent ownership controls, privatisation, and strong competition laws. Europe imposed centralised approval for government subsidy of state enterprises (European Commission 2005), facilitated European cross-border mergers, harmonised bilateral air service agreements beyond the European Union, and built an open internal market. The European liberalisation measures, known as the "third air package", came into force in 1993. The package gave Community air carriers unrestricted access to the intra-Community market, allowing airlines to operate within Europe as if it were a single country's domestic market. The package also removed all restrictions on tariffs from April 1997. Constraints on state aid to airlines are embodied in European Union deregulation:

....[this] has been accompanied by strict control of State aid. The application of the principle of single aid for restructuring (one time-last time) has thus allowed the more adaptable airlines to make the transition from a relatively protected operating regime to competing as normal players in the market. This has led to a significant restructuring of the whole air industry, a measure that became even more necessary after the events of 11 September 2001, the consequences of which on air transport were significant. Examples of consolidation in the industry are the recent alliances such as Air France/Alitalia, Lufthansa/Austrian Airlines and Iberia/British Airways, and the recent merger of Air France and KLM (European Commission, 2005).

German flag-carrier Lufthansa has led Europe's airline consolidation process, acquiring Swiss International, Austrian, British Midland, Brussels Airlines (CAPA 2010) and a minority stake in US carrier Jet Blue (MSNBC 2007). Lufthansa also launched an Italian-based subsidiary unit as Italian state-owned Alitalia was restructured. The merger of Air France with Dutch carrier KLM provided a
platform for the reduction in the French government stake in Air France, and a merger between British Airways and Spanish flag-carrier Iberia continued the consolidation of European FSNC. The merged airlines continue to fly their separate brands from home country hubs, but co-ordinate schedules, loyalty programs, and pricing.

European deregulation progressed from domestic mergers (e.g. British Airways-British Caledonian), to cross border investment stakes (KLM-Air UK) and ultimately cross border acquisitions (Lufthansa-Austrian) (Brueckner and Pels 2005, CAPA 2010). Chronic loss-making state-owned Alitalia and Olympic were forced to undertake total restructuring and sale, with the restructured Olympic a takeover target of its domestic rival Aegean. The merger was blocked on competition grounds by the European Union, with Competition Commissioner Joaquin Almunia (Reuters 2011) citing the reduction in competition in the Greek domestic market as the basis:

>The merger between Aegean and Olympic would have led to a quasi-monopoly in Greece and thus to higher prices and lower quality of service for Greeks and tourists travelling between Athens and the islands...<

Ireland’s Aer Lingus recast itself as a low-cost operator and resisted with European Union intervention similar merger overtures from Ryanair, the Irish LCC which has grown to carry more than 73 million passengers in 2010 (Hancock and Beasley 2010). These competition rulings have come despite the open European market that would allow any European carrier to operate in competition on these routes.
While economic failure removed several airlines including Belgian flag carrier Sabena from the market, part state-owned Scandinavian Airlines sold off stakes in subsidiary carriers in January 2009 and scaled back fleet capacity to return its focus to the Scandinavian marketplace.

3.3.1.3 North America

United States deregulation in the late 1970's gave domestic carriers open route access, freedom from tariff regulation, permission to merge with competitors, and access to previously closed international routes. New entrant and merger activity in the United States has been constant since deregulation, with the original flag carriers TWA and Pan Am long since absorbed by domestic competitors and LCC pioneer Southwest Airlines growing profitably to command the second largest share (14%) of the US market in the year ending October 2010 (BTS 2010).

3.3.1.4 Australia

Australian domestic deregulation, implemented in December 1990, removed tariff-filing regimes, liberalised traffic rights, and facilitated the eventual foreign ownership of domestic airlines (BTCE 1995). The deregulation process was given full legal force and backed up with consumer protection. Following the abolition of the Australian Independent Air Fares Commission, the Prices Surveillance Authority was charged with monitoring Australian domestic airfares (BTCE 1995:2), while the Bureau of Transport and Communication Economics monitored consumer behaviour and the changes to airline capacity and schedules (BTCE 1995:4). New entrant LCC competition emerged, including Virgin Blue that took a major share of the Australian domestic market after the demise of Ansett in 2001.
3.4 Adapting Porter's generic strategies – The industry in four competitive zones

In Section 3.1 it was established that the development of the international airline business models can be described within the Porter (1980) generic strategies. In applying the Porter (1980) generic strategies to the industry, four airline business models become evident.

<table>
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<th>Distinctive Competence/ Competitive advantage</th>
<th>Lower cost</th>
<th>Differentiation</th>
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<tr>
<td><strong>Hybrid Zone:</strong></td>
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<td>• LCC expansion to longhaul</td>
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<td>fleet complexity.</td>
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<td>• Premium product with LCC</td>
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<td>features confuses customers.</td>
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<td><strong>Network Zone:</strong></td>
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<td>• Existing network carriers and Gulf entrants</td>
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<td>• Hub-based connectivity</td>
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<td>• Complex fleets</td>
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<td>• Traditional distribution</td>
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| **Online Zone:**                             |            |                 |
| • New entrant LCC                            |            |                 |
| • Online distribution                        |            |                 |
| • Simple fleet                               |            |                 |
| • Little to no connectivity                  |            |                 |

| **Niche Zone:**                              |            |                 |
| • Regional specialist e.g.                   |            |                 |
|   Bangkok Airways                            |            |                 |
| • Simple fleet                               |            |                 |
| • Interline connectivity                     |            |                 |
| • Traditional distribution                   |            |                 |

after Porter 1980

Fig 3.3 Adapting Porter's (1980) generic strategies to the airline market.

3.4.1 Network Zone – large network airlines offering differentiated service

Broad differentiators are, with the exception of recent Gulf state entrants, the legacy network carriers, and make up the largest share of the airline industry (Doganis 2006:263). These airlines operate extensive route structures that build traffic flows by connecting multiple nodes over major hub cities (Doganis 2006).
Fleet structure is a complex mix of short and longhaul jets capable of meeting a range of missions. In this zone, a broad range of products is offered including premium services, loyalty and alliance programs, air cargo, corporate travel management, and interline connectivity (Doganis 2006).

The hub and spoke structure of this model was imposed by regulatory obligations on European network carriers since traffic rights applied bilaterally from their home country, forcing 6th freedom traffic consolidation over a home country hub. The intra-European market was liberalised in 1997, allowing European carriers to mount services within and between other European countries (Vasig Fleming and Tacker 2008). After this liberalisation, few network carriers expanded their focus beyond their home country hub and spoke networks. British Airways’ German subsidiary Deutsche BA was an exception, with BA expanding its minority shareholding to full ownership of the German domestic carrier (Vasig et al 2008:163). Deutsche BA was subsequently disposed of by British Airways and returned to German ownership in June 2003, when it was rebranded ‘dba’. It was absorbed by Air Berlin in 2006 (Weismann 2007).

Interestingly, once deregulated, US major carriers adopted a similar hub and spoke structure to consolidate a wide range of domestic city pair combinations over a small number of hub cities, with individual hubs often dominated by a single carrier.

Carriers in this zone have massive fleet and product investments, and given their incumbent roles are predicted by the theory to be more likely to adopt the defensive strategies of the Resource Based View (Barney 1991, 1997, Peteraf 1993), protecting key product capabilities from replication, or refreshing them
through innovation while defending the hub-based network. The strength of these carriers often lies in their scale, particularly their dominant presence in a home market (Brueckner and Spiller 1994).

New entrants in the Middle East have attempted to replicate this FSNC structure and scale with a rapid expansion of routes.

A critical vulnerability of the network zone is the exposure of network carriers’ shorthaul regional networks to LCC entrants who are able to ‘cherry pick’ prime city pairs and capture market share with aggressive price competition while avoiding the cost of network connectivity. The extent of this vulnerability is dependent on the relative size and profitability of the network carrier’s longhaul operations, the range of secondary city pair markets and the willingness of the home state government to liberalise market access (Forsythe King and Rodolfo 2006).

European network carriers with high yielding trans-Atlantic markets such as British Airways, Lufthansa and Air France whose long-haul premium cabins achieve profitable operations rely on hub connecting traffic from shorthaul European flights that are vulnerable to LCC competition. ASEAN carriers such as Malaysia Airlines or Thai International built long haul route expansion with lower yielding 6th freedom connecting traffic while superior profits were available from bilaterally protected regional markets within Asia (Douglas 2005). The impact of LCC entry to ASEAN markets is starkly illustrated by the opening of the Kuala Lumpur-Singapore route to LCC competition that was noted previously.
3.4.1.1 Too big to fail

Airlines in the Network zone face the 'failure of competitors to fail' when financial circumstances have triggered an event that would lead to acquisition or closure in a less regulated environment. State supported restructuring for airlines as diverse as Swissair, Air New Zealand, Japan Airlines and Malaysia Airlines assured the continuation of businesses that would otherwise have failed. Borenstein and Rose (1995) found no significant impact on competitive pricing in the United States from seven airlines that were restructured under bankruptcy protection between 1989 and 1992. Unlike state restructured and state subsidised airlines in Europe and the Asia-Pacific region, five airlines in the Borenstein and Rose study, including the two United States international flag carriers of the regulated era (Pan Am and TWA) exited the market. Survival and indeed steady traffic growth continues despite many airlines (and the industry in aggregate) failing chronically to cover the cost of capital (IATA 2008).

Operating margins for airlines should represent an adequate return on the capital invested. Long-term survival should require an airline to demonstrate its ability over the longer term to source and service the capital requirements for growth and development, including fleet renewal, new route entry, and technology adaptation. (Holloway 2003:41). Achieving strong margins can be difficult where competitor carriers are driven by political considerations rather than profitability, and continue to serve or even expand markets by suppressing margins to capture market share.

The fragmented structure persists while regulation of the industry makes cross border mergers difficult. With the recent exception of the European Union's single
aviation market, foreign carrier overseas stakes are routinely limited to minority positions. In the absence of global consolidation, the US airline industry has laboured on with bouts of Chapter 11 bankruptcy protection (Borenstein and Rose 2007:21) and the periodic domestic consolidation of large carriers.

Before limits on state aid were imposed, Europe saw unprofitable state-owned carriers continue to trade and at times even consolidate other loss-makers from the same country into their group\(^6\), while the ASEAN and China markets have seen (and continue to see) state support for struggling flag carriers, through combinations of subsidy, re-capitalisation, and the manipulation of traffic rights.

3.4.2 Niche Zone

The Niche Zone, representing Porter’s (1980) narrowly focused differentiation strategy, is occupied by smaller full service airlines addressing narrow market segments. Bangkok Airways, with its focus on Southeast Asian cultural tourism is a longstanding example of this business model. The Niche zone is also an entry point for new entrant network aspirants, and a potential retreat for traditional network carriers forced to scale back their operations such as Irish carrier Aer Lingus and Indonesia’s Garuda (Business Spectator 2011).

The attrition rate in this zone is high, with recent failures ranging from the cluster of new entrant ‘all business class’ operators on the North Atlantic who collapsed in 2007/08, to scaled down network carriers Alitalia, Swiss, Austrian and Olympic

\(^2\) Air France incorporated UTA, AOM and the domestic carrier Air Inter, Austrian Airlines absorbed Lauda and Tyrolean, while SAS absorbed the Norwegian carrier Braathens and launched Spanair.
whose residual businesses were sold on, often to European competitors. Carriers run the risk of being ‘stuck in the middle’ (Porter 1980, McDaniel 1997) in this model, enjoying neither the cost advantage of LCCs nor large networks delivering connecting feeder traffic through major hub cities.

One airline to grow successfully from this zone to the Network zone was Finnair, which developed a network of flights into Asia, and leveraged its gateway position in Northern Europe to connect passengers onto its European services. This focus on a growth strategy on routes to East and Southeast Asia limited the struggle of head to head conflict with LCCs on its European regional network.

3.4.3 Online Zone

The Online Zone represents the most common current entry point to the industry. Barriers are low for LCC’s who distribute online and compete on price (OAG 2006). Entry to a small market segment is possible, even with a single aircraft, allowing these carriers to take market share from large network operators on individual city pairs (Morrell 2007). Guerilla pricing tactics allow new entrants to disrupt market segments and even render single city pairs unprofitable for network competitors.

Simple fleet structures and access (in Europe at least) to cheaper secondary airports combined with online distribution and high density seating give a marked cost advantage as great as 45% (ICAO 2003). Cost centres such as inflight catering, checked baggage, and airport check-in that are traditionally bundled into the full service model are converted to revenue streams by LCCs where passengers pay up
to 20% of the airline's revenue in fees and charges for ancillary services (Amadeus 2010).

Following a 'focused low cost' strategy, a low cost airline should be amongst the lowest-cost producers in its market segment. Pricing should be at industry averages to earn higher margins, or below the average yield to gain market share. Airline experience shows that LCC's have entered markets with aggressive price discounting to capture market share, and have continued aggressive pricing in the face of responses from incumbents, particularly where capacity is growing. Low cost carriers have not been assured of profitability, but their entry to markets changes incumbent carrier competition.

LCC cost advantages are achieved in part by process efficiencies, outsourcing, unbundling the airline product, and avoiding some costs such as meals and entertainment altogether. Ryanair extended the cost saving by identifying secondary airports willing to subsidise the airline’s operations in return for Ryanair generating broader economic activity in the airport catchment. This approach turns a major cost component into a revenue stream, but has faced challenges by European competition regulators (Steinrucken and Jaenichen 2004). Network carriers’ connectivity and network costs generally leave them unable to match LCC unit costs, even where they can match LCC performance on individual components such as aircraft turnaround times, and operate from identical airports.

An IATA cost study (2005) compared unit costs for the three largest network carriers in Europe with low cost carriers Ryanair and easyJet, finding a 40% cost gap for easyJet.
and a 64% cost gap for Ryanair. This cost advantage was principally achieved from
significantly lowered operational and distribution costs, and was enhanced by a higher
seating density. The study also identified 60-70% gaps between major network carriers
and low cost airlines in Asia and South America. Given the significant difference in
costs, successful full service competitors focus on capturing and retaining higher
yielding business. In some markets network carriers have adopted cost saving measures
implemented by LCC competitors including faster aircraft turnarounds and checked
baggage fees. Yoffie and Kwak (2002) identified the risk of competitor's replicating
capabilities noting,

*Each generic strategy has its risks, including the low-cost strategy. For
example, other firms may be able to lower their costs as well. As technology
improves, the competition may be able to leapfrog the production capabilities,
thus eliminating the competitive advantage. Additionally, several firms following
a focus strategy and targeting various narrow markets may be able to achieve
an even lower cost within their segments and as a group gain significant market
share.*

Experience with the LCC model in Europe, North America and Australia suggests
that, under current conditions, carriers adopting this business model can capture
up to one third of the regional market in which they operate (OAG 2006:1). The
use of a single aircraft type, optimum sector lengths below two hours (OAG
2006:3) and the requirements for fast turnaround operations place barriers to
some market segments served by the network operators.

3.4.4 Hybrid Zone

Standalone long-haul low fare operations, network carriers attempting to
reposition as low cost operators and LCC carriers expanding to more complex
business models from the Online Zone make up this segment. Standalone long-haul low-fare operations proved unsuccessful for a range of airlines including Oasis Hong Kong, Zoom, XL, and Sterling. Irish flag carrier Aer Lingus withdrew from the oneworld alliance and adopted a low cost network operation in its competitive battle against Ryanair. In the Asia-Pacific region Air Asia, Jetstar, and Virgin Blue have expanded into long haul operations from their regional LCC bases.

The weakness of the long haul low fare model comes from the reduced competitive advantage these carriers retain on longer flights. Much of the LCC cost advantage comes from configuring aircraft with very tight seat pitch, and limiting services, while further advantage is gained from fast turnarounds that allow extra flying within the operating day. These advantages fade on longer haul journeys where larger galley and lavatory spaces are required, where tight seat pitch becomes a more obvious customer negative, and where 7-12 hour flights eliminate the gains of fast airport handling (CAPA 2009).

This model brings the carriers into direct competition with the network operators, but in some cases without the advantage of connecting hub feed, premium cabin yields, and connectivity. These weaknesses are minimised where the carrier is the subsidiary of an existing operator, which perhaps helps explain the apparent viability of Jetstar and Air Asia X in this otherwise difficult segment.
3.5 Summary of the chapter

This chapter outlines the application of the Porter (1980) generic strategies model to the airline industry. The development of the industry from its niche and highly regulated post-war position to the current global industry, and the roles of technology and business model innovations, are explained through the generic strategies model. The impacts of innovation, the constraints of regulation, and the asymmetries of unevenly liberalised markets are addressed. Finally the generic strategies model is adapted to describe the industry’s structure and the strategic issues facing airline managers.
Chapter Four
Preliminary Studies

One purpose of this thesis is to establish a conceptual framework that identifies the relationships between factors impacting firm performance in the airline industry. The thesis also seeks to inform policy development on aviation deregulation and airline privatisation, and to this end a theoretical framework was developed through several preliminary studies.

4.1 Published papers

Three studies reported in this chapter examined sample periods of the ICAO and ATW databases utilised in this research, tested the development and evolution of both new entrant and existing carriers against a range of strategy models and frameworks, and considered the impact of legacy government ownership and emerging business models on airline innovation.

By testing each of the aspects of the thesis research goals in the preliminary studies, the theoretical model is developed incrementally. The final model derived for this research is described in Study Three.

Business model innovation in the airline industry was encouraged by access to online selling and distribution from 1999. The growth of LCCs in Europe (Ryanair, Air Berlin, and EasyJet), the emergence of Air Asia in Malaysia in 2004, and the
establishment of Virgin Blue in Australia in 2001 drew heavily on direct selling to customers from these airline's websites. Economic conditions for airlines improved after the disruptions from the World Trade Centre attacks in New York in 2001 settled, opening the way for market entry. The first study in this Chapter addresses the emergence of airlines adapting the low cost model to serve longhaul markets, and identifies the differing outcomes under varying ownership models and route selections.

Study One: Long-haul market entry by value-based airlines: dual business models support product innovation.7

Study One contributes to this thesis by examining product innovation that was undertaken at a peak time in the business cycle in 2005 when industry margins were improving. This study tests the reliability of existing theoretical frameworks to both describe airline business models and to predict likely financial outcomes. Gudmundsson and van Kranenburg's (2002) extensive review of post-deregulation entry to the United States market demonstrated the positive relationships between GDP growth and both the cost of fleet acquisition and the propensity for new market entry. Using Gudmundsson and van Kranenburg's model (2002), new entrants could be predicted to emerge in the strong economic climate of 2005-2006.

Rapid growth in demand creates opportunities for firms to enter irrespective of the size of the entry barrier. In previous studies it is shown that a growing economy will stimulate the demand of the number of flights. This development

creates opportunities for potential airline companies to enter the market. Hence, we argue that entry should be positively related to the demand growth. The relative change in the real US GDP growth, is used as a measure of the industry demand growth (Gudmunsson and van Kranenburg 2002:212).

Tarry (2005) reports a long term relationship between GDP growth and air travel demand, finding demand growth approximately 1.8 times GDP. Trethaway (2004) identified the opportunity for low cost carriers to enter even a single market and capture passengers who did not require complex connectivity in their itinerary, and predicted the growth of LCCs at the expense of the FSNC model. This capture of FSNC market share by LCC airlines is addressed in the analysis undertaken in this thesis and reported in Chapter Seven.

A number of new airlines (including Eos, Maxjet, Oasis Hong Kong) attempted market entry outside the short haul low-cost model in 2005, several of them with premium products positioned against major network carriers in key international long haul markets of New York-London and London-Hong Kong. The study categorises airlines using the Porter (1980) generic strategies, and applies strategy and innovation frameworks to assess the viability of long-haul premium cabins on airlines not operating inside the FSNC model.

While none of the airlines studied operated a FSNC model, several were low cost subsidiaries of existing airlines. In these cases the subsidiary carrier relationship to its parent is placed within the Markides and Charitou (2004) dual business model framework, before the airline’s approach to market entry strategy is assessed within the Yoffie and Kwak (2002) judo strategy model.
The premium cabins and the fleet choices of new 'value-based' entrants were evaluated against the aircraft of direct competitors on the contested routes. Data to assess the comparative advantages between aircraft types and their relative fuel efficiencies (given fuel is the single largest cost component for most airline operations) were sourced from Australian Civil Aviation Safety Authority (CASA) Standard Economic Value Guidelines (2007), and a longitudinal study of commercial aircraft fuel efficiency (Peeters Middel and Hoolhorst, 2005). Aircraft cabin configurations can significantly impact the overall economic performance of an aircraft. Configuration efficiency was assessed by calculating the seating density of each aircraft (identifying the equivalent number of economy seats forgone for each business/premium seat fitted to an aircraft to produce a comparable all-economy configuration benchmark). Yield (price) comparisons between the new entrant and incumbent FSNC airlines business class fares were made. A further comparison of the spaciously configured Eos B757 was made with British Airways' trans-Atlantic First class product and price.

Product features of the new entrants were evaluated against their key competitors to identify the value proposition offered (Kim and Mauborgne 2009). The product value elements assessed include frequency, connectivity, airport access, loyalty rewards, airport lounges, meals, seat recline, and entertainment. These features are tracked by consumer information sites, including 'Skytrax', where information was sourced for this research.

The product innovation proposed by the 'all Business class' operators was the removal of stress from the airport stage of the travel experience, achieved by
locating London operations at a secondary airport. The smaller total onboard seat count was also a strong sales message of new entrants, although the total premium cabin seat counts were higher than the premium cabin configurations of their FSNC competitors on parallel routes.

Lacking the fleet size, network connectivity, frequency, and loyalty programs of their direct competitors, the new entrants, fell short in the product features that attract the highest yielding premium travellers, often by a significant margin.

Initial analysis in this study positions those airlines (e.g. Jetstar) operating as subsidiaries of larger carriers within the Markides and Charitou (2004) dual business model framework. Both Jetstar, a subsidiary of Qantas, and Air Asia X, a subsidiary of Air Asia, entered new long-haul markets that complement rather than conflict with the parent’s strategy. In this case, the Markides and Charitou (2004:25) model proposes ‘phased separation’ where the new business leverages the firm’s experience before separating into a standalone unit.

The success rate for earlier airline-within-airline start-ups is poor, with Ted (United), Song (Delta), and Australian (an earlier Qantas attempt) subsequently reintegrated with the parent’s operation. Both Jetstar and Air Asia X appear to have been given enough management independence to establish operations in markets not contested by the parent airline and usually with limited competition from other airlines. In Judo Strategy terms, these are true ‘puppy dogs’ (Yoffie and Kwak 2002).

The remaining carriers in the study are stand-alone new entrants with no existing
carrier relationship. For the all-business class entrants there was an immediate
drive to capture large volumes of premium traffic either through brand-switching
business class passengers from the FSNC competitors or through expanding the
market with 'trade-up' passengers from economy cabins on major trans-Atlantic
routes of the FSNC airlines.

For Oasis-Hong Kong, the challenge of filling a Boeing B747 with a large business
class cabin meant competing with five FSNC on the London-Hong Kong route.
Entering the London–New York market requires, in Judo strategy terms, 'mooning
the giants of the global industry' (Yoffie and Kwak 2002) in their core home
markets, and attempting to entice away their most valuable passengers. The result
is lethal price competition in line with the Porter (1980) five forces model, leaving
the niche operators unable to achieve the FSNC yields while incurring higher cost
by offering superior space per passenger. Discount pricing, and the dependence on
price to drive traffic, continued well after their market entry offers (Sharkey 2007)
and left the carriers with a mismatch in their strategy. A product designed in
Porter (1980) generic strategy terms as 'Focused Differentiated' was being
positioned and priced in the market as a 'Best Cost' service but without significant
cost savings. FSNC airlines retained frequency advantage, frequent flier programs,
and network scale against the new entrants, and were able to optimise loads with
connecting traffic, and global distribution. The entrants fail Kim and Mauborgne's
(2009) value proposition challenge, while inviting retaliation from the industry's
giants.

This study also highlights the requirement of adequate capitalisation for market
entrants. Porter (1980) identifies access to adequate capital as a barrier to entry
that cost-leader firms may not overcome. The high rate of failure amongst airline start-ups is often attributed to this weakness, even where they have built effective schedules and tapped into efficient distribution channels. Each failed airline in this study illustrated the unwillingness of investors to put forward further funding as the key reason for suspending operations. Maxjet Chief Executive Officer William Stockbridge closed the airline on Christmas Eve 2007 with a website announcement:

_I sincerely apologise to our shareholders, employees, customers and suppliers. Our efforts to raise additional capital have been unsuccessful._ (eTN 2008).

By contrast, three new entrants in the Asia-Pacific region entered routes with little or no direct competition. Product offerings followed the LCC model with costs avoided and services priced for incremental revenue generation. Premium offerings were limited to a premium economy style product rather than the high end business class products of the region’s flag carriers. Both Jetstar and Air Asia X enjoy the additional benefit of parent companies able to provide logistical and management support, and to source advantageous pricing for aircraft leases and fuel hedging through a larger organisational base. Announcing the Qantas group’s 2006 results, Chief Executive Officer, Geoff Dixon, detailed a strategy to pursue

...the aggressive growth of Jetstar international and QantasLink into markets where their costs and model are better suited the customer base (and) integrate the Jetstar group operations, including domestic, the Singapore-based Jetstar-Asia and the new long haul international operations (Qantas 2006).
The strength of the incumbent carriers in the face of new entrant competition is not always as clear cut as it appears to be on the North Atlantic. Low cost airlines in Europe and Southeast Asia have successfully adopted contrarian behaviours to capture market share from established network carriers in periods of downturn. This is addressed in analysis reported in Chapter Six.

Study Two, Capturing advantage from changing circumstances – or not. The shackles of path dependent learning on ASEAN airlines\(^8\)

Study Two addresses the capacity of full service airlines to adapt their strategy to respond to new carrier entry, and considers the impact of ownership on airline performance. Taking a competitive strategy perspective, this study considers the influence of path-dependent learning on Asian airlines, and the airline industry tension between long fleet and network planning time horizons and the short-term disruptions of falling demand or rising costs.

It draws on evidence from the International Civil Aviation Organisation (ICAO) and Air Transport World (ATW) databases that form the basis of the research in this thesis to show successful contrarian behaviour by low cost carriers in Europe following the 2001 terror attacks in New York, and by Malaysia-based Air Asia during the SARS crisis in East Asia in 2003-2004. This preparatory work forms the basis of the analysis of low cost and full service airline operating margin performance, tested under three economic growth scenarios that is presented in Chapter Seven.

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In periods of downturn the demand for new aircraft declines as airlines constrain capital spending and as the stock of parked aircraft grows. Entering weak aircraft markets in the aftermath of the September 11th 2001 terror attacks, Ryanair began fleet expansion, locking in advantageous aircraft pricing from Boeing as orders from full service carriers were cut back. This contrarian approach to fleet expansion was repeated in the 2009 economic downturn (CAPA 2009).

The Global Financial Crisis and the first steps of ASEAN deregulation offered a similar opportunity for agile ASEAN carriers to capture advantage. While the region’s flag-carriers were scaling back, Air Asia’s revenue grew by 33.5% for the March quarter of 2009 on a passenger number increase of 20.5% (CAPA 2009). Qantas group performance for the same period shows its low cost subsidiary Jetstar growing by 10.6% domestically and 37% internationally, while Qantas’ domestic traffic fell 2% and international routes fell 10%. The move to capture contrarian opportunities was outlined by Air Asia Chief Executive Officer Tony Fernandes:

*The dramatic cuts in flights and capacity by many of Asia’s legacy carriers have resulted in severe traffic decreases at many of Asia’s airports. This is creating enormous opportunities for Air Asia, as these airports compete to get our business and are more amenable to provide desirable terms and concessions to Air Asia in order to attract our airline* (Air Asia, 29 May-2009).

This earlier study (Douglas 2009) tests several hypotheses that inform the hypotheses developed for this thesis:

1. That legacy network carriers will be bound by their past experience, making their decision-making more path dependent and less responsive, and
2. That this path dependence will be intensified where there is a significant degree of state-ownership or control. That is, the decision-making process in the firm is not only shaped by its past experience, but that this experience exerts a heavier hand when the state has a stake in the business. Conversely,

3. That privatised legacy airlines should be able to act more freely, but arguably will still face historical constraints of structure and behaviour that new entrant low cost operators avoid.

Recent experience shows that the ASEAN region’s airlines have differing financial and strategic success. By an analysis of longitudinal financial data, this research study sought to identify carrier responses to changes in the operating environment, and to determine if those changes came from economic or regulatory factors. Capacity changes, load, unit cost, and yield performance were assessed to compare the actions of airlines in the ASEAN region against those in Europe.

In 2009, the short-term focus of the airline industry switched from the surge in fuel costs that brought a sudden end to improving profitability, to the economic downturn that brought steep reductions in premium cabin and freight revenues. The industry's performance has been cyclic though its entire jet-age history (IATA 2008), but the 2008-2009 downturn in the cycle brought new pressure to bear on the legacy national carriers of Southeast Asia, because this cycle also brought contrarian behaviour from established low cost competitors.
Airline industry profitability remains poor; a fact underlined by ICAO data that reveals that revenue per available seat kilometre has increased only 6% over 14 years for the major carriers of Europe and 10% for the carriers of Asia. Despite aggressive cost cutting, more fuel efficient engines, online distribution, and rationalised networks that kept unit costs in 2004 close to 1991 nominal levels, airlines are no more profitable (Trethaway 2004). Instead of improving airline returns, the benefits of cost reductions have been passed to passengers in cheaper airfares.

This study's three objectives were:

- to expand on the earlier research of Backx et al (2002) and Chang et al (2004) to confirm that state ownership and control continues to negatively impact airline performance. Backx et al (2002) addressed early stage deregulation. This study looks further to explore the longer run relationship between residual state ownership and an airline's return on sales. To this end it also draws on work by Machiati and Siciliano (2007) who addressed pre and post deregulation outcomes for European airlines, and identified the significant state-aid that was embedded in several privatisations.

- to analyse the strategic choices of European privatised airlines in a deregulating market. Major European carriers including industry giants British Airways, Air France, and Lufthansa that have been privatised with Air France completing its privatisation in a merger with Dutch flag carrier KLM. Other carriers remain either totally or partially in state hands, including Austrian Airlines (awaiting European Union approval for its sale...
to Lufthansa that was subsequently approved), Scandinavian, Alitalia (finally out of government hands in 2009), and Aer Lingus. It is expected that carriers with state ownership will continue to generate a lower return on sales than the privatised airlines despite the progress of deregulation, and that the privatised carriers will more aggressively modify their business models to achieve their advantage and address low cost competition.

- to consider the applicability of the European experience to the currently deregulating ASEAN airline market, and to contrast the performance of Air Asia with its larger European counterparts EasyJet and Ryanair.

Backx et al (2002) established the link between ownership structure and economic performance for privatising air carriers. That research identified superior economic outcomes for privatised and stock market listed airlines using data from the late 1990's. The late 1990's were a period of relative calm and stability for the aviation industry (IATA 2006). The privatisation of European and Australasian carriers was in its early phases, GDP growth was constant, and the Internet had not yet emerged as a disruptive distribution channel.

In both Europe and Australasia, deregulation and privatisations lead to multiple-designation of airlines in bilateral agreements, and progressively to the full deregulation of internal markets. Importantly privatisation and deregulation in Europe and Australasia also preceded the disruption of Internet-enabled low cost carriers. Privatised airlines retained a focus on their home base hubs, making only limited excursions into neighbouring markets. The result was a deregulated Europe where the major flag carrier networks stayed close to home and bore a
strong resemblance to the hub and spoke networks of the deregulated legacy carriers in the USA.

The expansion of the disruptive or guerrilla business model of Ryanair in Europe became viable with the full implementation of the third package of internal deregulation in April 1997 (United Kingdom Parliament 1999) and with the introduction of Internet sales on the carrier's website from late 1999. By 2000, much of the state-owned flag-carrier network in Europe was at least on the path to privatisation, with British Airways and Lufthansa completed and Air France, KLM, and Iberia well underway.

Rationalisation, mergers, and government restructuring assistance often accompanied European privatisations (Machiati and Siciliano 2007), including British Caledonian merging into British Airways in 1987, UTA into Air France in 1992, and the German government underwriting Lufthansa's pension obligations in 1995. Similarly, the 1995 Australian privatisation of Qantas included recapitalisation and a merger with its state-owned domestic sibling Australian Airlines.

This study provided another development step for this thesis by applying the ICAO revenue database, (including for some airlines their operated capacity in Available Tonne Kilometres (ATKs)), to an investigation of airline operating performance over an extended period. In particular it was possible to assess the responses to the downturn in demand following the September 11th 2001 attacks in New York.
European data was available for major flag carriers British Airways, Lufthansa, Air France, KLM, SAS, Austrian, Iberia, Alitalia, and Swiss/Crossair permitting a wider analysis than that undertaken by Machiati and Siciliano (2007). Data is also available for a range of smaller regional/charter and low cost carriers including Monarch, Spanair, EasyJet, and Ryanair. Asian airline data is available for Singapore Airlines, Thai International, Malaysian, Garuda, Japan Airlines, All Nippon, Cathay Pacific and Air Asia. This offered the opportunity to track year on year capacity, unit cost, and unit revenue (yield) movements for full service and low cost airline business models, and to contrast the responses and adaptations of privatised carriers with their state-owned peers. The low cost market in Europe was well represented, with Ryanair and easyJet jointly contributing 51% of the low cost carrier passenger numbers in Europe (ELFAA 2008) and operating in the major markets of Europe that are served by legacy full service network carriers.

The ability to study airline deregulation in Southeast Asia was more limited, as deregulation started much later than in Europe, with the early stages of ASEAN deregulation coinciding with market disruptions caused by the SARS outbreak in 2003. The opening of traffic rights between ASEAN capital city markets from December 2008⁹ expands that process, but is not captured in either this

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⁹ Three rounds of negotiations and four sets of schedules of specific commitments were embodied in the Protocol to Implement the Initial Package of Commitments under the ASEAN Framework Agreement on Services signed on 15 December 1997

Protocol to Implement the Second Package of Commitments under the ASEAN Framework Agreement on Services signed on 16 December 1998

Protocol to Implement the Third Package of Commitments under the ASEAN Framework Agreement on Services signed on 31 December 2001

Protocol to Implement the Fourth Package of Commitments under the ASEAN Framework Agreement on Services signed on 23 November 2004
preliminary study or in the timeframe of the research in the thesis. Of more impact has been the expansion of low cost carriers in the Southeast Asia since 2002, when full service network carrier cutbacks during the SARS disruption encouraged the expansion of low cost airlines. A good example of this expansion is the entry of Air Asia to the Malaysia-Thailand market. By replacing services cut back by Malaysia Airlines, Air Asia gained access to its first international route.

The privatisation and stock market listing of airlines in Europe and Australasia in the 1990's largely bypassed ASEAN, with most major carriers in the region remaining either wholly or partly state-owned, and new low cost entrants either subsidiaries of existing carriers or linked to family conglomerates. Smaller privately held carriers like Bangkok Airways and Philippine Airlines have enjoyed tacit state protection through limits on competition.

In Europe new entrant carriers including Ryanair and easyJet took advantage of the deregulating European Union market with the low cost carrier model (Adler2001), and were swift to enter markets abandoned by network carriers in the downturn following the New York terrorist attacks of 2001. The ability to enter and exit secondary markets without the need to support major hub infrastructure made the low cost airlines opportunistic and highly responsive. The existence of large mature markets and the availability of secondary airports further supported

ASEAN Framework Agreement for the Integration of Priority Sectors signed by the ASEAN Leaders together with the Roadmap for the Integration of Priority Sectors on 29 November 2004 in Vientiane, Lao PDR, which includes Air Transport, provides measures to deepen and broaden internal economic integration and linkages, with the modes of supply.
the development of low cost operators in Europe. These factors do not exist to the same extent in Asia (Chin et al 1999, Hooper 2005).

Differences in market size, geography, economic development, competition from land transport modes, and airport access have created a different environment for the ASEAN new entrant carriers from those in Europe, but their full service competitors have to adapt, just as their counterparts did in Europe. It is argued in this preliminary study that state ownership impedes that adaptation, and that the impediment is demonstrated both through a poorer return on sales for carriers with state involvement, and an improved performance for carriers that are privatised.

<table>
<thead>
<tr>
<th></th>
<th>Revenue Euro billions</th>
<th>Operating Expense</th>
<th>Operating Income - before tax</th>
<th>Return on Sales %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed –free float</td>
<td>46.3</td>
<td>43.4</td>
<td>2.9</td>
<td>6.1</td>
</tr>
<tr>
<td>Hybrid – part state-owned</td>
<td>39.7</td>
<td>38.6</td>
<td>1.1</td>
<td>2.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>86.0</td>
<td>82.0</td>
<td>4.0</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Table 4.1 Illustrates operating income by airline ownership. Europe for the years 2006/7

Analysis of the 2007 financial results of the eighteen (18) largest European carriers supports the earlier findings of Backx et al (2002) with listed carriers outperforming the rest, and those with partial government stakes performing better than carriers that were totally state held. Furthermore, the use of exact ownership percentages provides a
significantly better R² than using a dummy variable for ownership (0.696 against 0.404). Ownership (Beta 0.443) and growth (RPK Beta 0.551) were the most likely predictors of higher return on sales than the business model adopted or the scale of the airline. Increased low cost carrier penetration has not altered these results.

One measure of the weak performance of the airline industry is the stagnation of yields. From 1992 to 2006 European yields per available seat kilometre increased only 6% in nominal terms. Despite heavy investment in revenue management systems, online distribution, enhanced business class products, and global alliances, carriers adopting a differentiation strategy have been unable to improve the overall yield performance of the industry, and have only sustained their operations by constant cost-savings. These cost savings have generally been returned to customers, particularly where the entry of low cost carriers placed downward pressure on regional airfares.

Nonetheless, the listed carriers outperformed their state-owned rivals, and their success was not only from cost reduction. Analysis of both yield and unit cost performance shows that the privatised operators moved to reposition their business models. British Airways pursued a highly differentiated premium product position, strengthening its yields by a greater margin than the cost incurred in repositioning the product while Lufthansa shed yield premium but made larger cost inroads, as did Iberia. Air France and KLM merged the operation of two network carriers based in key European hub airports, while retaining their separate brands.
Fig 4.1. European carrier revenue/cost changes measured in cents/ASK 1992-2006

Of the airlines moving to full privatisation only Aer Lingus has made a radical change towards a value based best-cost model, shedding significant yield but making even greater inroads to its previously unprofitable cost base. Conversely, Scandinavian has seen its yields decline without a corresponding cost correction (illustrated in Fig 4.1) and Alitalia has experienced both declining yields and increasing costs to sit (at the time of the study) at the edge of bankruptcy, and await a further round of Italian government intervention. Austrian has failed to improve its position despite a significant growth in scale, and remained unprofitable, with a 43% share of the company still held at that time by the state privatisation agency.
This preliminary research and the earlier work of Backx et al (2002) demonstrate that listed carriers deliver a higher return on sales, and that, freed from institutional pressures and with the new discipline of investor expectations, the newly listed carriers had good reason to innovate and outperform their earlier results. Privatisation has been accompanied by the progressive deregulation of the intra-European Union market, and subsequently the trans-Atlantic market. The entry of low cost/low fare carriers in the previously closed European bilateral markets has forced a change on the entire industry, not only the privatised carriers. All airlines have moved to reduce costs over the past fifteen years, but this research shows that the privatised carriers were best able to adapt to the changes required.

Having identified the European airline industry’s transition through the period of privatisation and deregulation in this preliminary study, the opportunity exists to consider the applicability of any European experience to the Asian aviation market, particularly the ASEAN region as it deregulates and as low cost carriers enter regional and longhaul operations.

Australia and New Zealand followed the European privatisation path with their national carriers between 1989 and 1995, while Malaysia and the Philippines sold their flag carriers to entrepreneurs. Shares in Singapore Airlines and Thai International are traded, but both have large state shareholdings, Singapore Airline’s is through the state investment vehicle Temasek which also holds a stake in low cost airline Tiger and previously held a stake in Jetstar-Asia. Cathay Pacific’s ownership structure was modified with the return of Hong Kong to China in 1997. Cathay pacific remains free of direct state ownership or management control, and has resumed control of regional
carrier Dragonair with its valuable network between Hong Kong and China. Japan Airlines and All Nippon Airways are the largest carriers in the Asian region, and are both listed. Subsequent to this study Japan Airlines entered a government sponsored bankruptcy restructure.

It is worth noting that several of the world’s most profitable carriers are located in the Asia-Pacific region, with Singapore Airlines, Cathay Pacific and Qantas all exhibiting strong operating margins. Of these carriers, only Qantas moved from state ownership in the timeframe of the study. Yet when Asian carriers are assessed using the approach taken with the European market, Qantas exhibits the greatest change in performance both through yield improvement and through improved operating margin. Figure 4.2 outlines the strategic moves of a selection of major carriers in the Asia-Pacific region measured in 1992 and 2006. The intervening journeys to bankruptcy and restructuring of Malaysia Airlines and Air New Zealand and the demise of Australia’s Ansett Airlines occurred in much the same way as the rescue of Swiss and the demise of Sabena in Europe and are not recorded in this analysis.
Fig 4.2 Illustrates the Asia-Pacific carriers revenue/cost changes measured in cents/ASK for the years 1992-2006. The figure illustrates the positive margin achieved by Qantas and Air New Zealand after privatisation.

Yields in Asia (other than Japan) are significantly lower than those of Europe. Even full service legacy airlines in Asia operate with unit costs close to those of European low cost carriers Ryanair and EasyJet, while Southeast Asian new entrant Air Asia claims the global industry’s lowest unit cost structure. This low cost/low yield industry structure helps to explain the success of the ASEAN carriers at driving their European competitors off the Australia to Europe route once the pricing was deregulated.

While the market has a lower cost structure than Europe, it also suffers (apart from Singapore Airlines) from poor profitability with Thai, Malaysian, Garuda, Vietnam Airlines and Royal Brunei all struggling to cover the cost of capital even at the peak of
the industry cycle. The regional markets previously protected by bilateral agreements
are now opening to low cost airlines with some of the world’s lowest operating costs,
and in two cases with strong parent airlines (Tiger/Singapore Airlines, Jetstar-
Asia/Qantas).

The experience in Europe suggests that ASEAN flag carriers should be set free from
state owners and allowed to reposition their business models to compete more
effectively, both against the low cost carrier entrants and (perhaps more critically) with
the emerging full service carriers from the Middle East who are rapidly replicating the
business model and networks of the ASEAN carriers but from an arguably more
advantageous geographic location (Dunning1993:183).

Relaxing institutional control of ASEAN airlines may prove more difficult than the
process in Europe and offers scope for further research. ASEAN is less integrated
politically than the European Union, and does not have a centralised legal system to
enforce policy. Southeast Asia also lacks alternative surface transport to replace air
travel in under-developed regions and throughout island states. Finally, it is unlikely
that nations dependant on tourism flows would be as sanguine about the collapse of a
national carrier as the Belgian’s were with the failure of Sabena, or the Australian’s
with the collapse of Ansett.

The third study addressed in this chapter introduces the concept of institutional
quality, and considers the combined impacts of national institutional quality with
government ownership of airlines. Study Three draws on a two year segment of
the airline operating margin database constructed for this research, along with
measures of institutional quality drawn from the Heritage Foundation and The Wall Street Journal Index of Economic Freedom (2009). This index is applied as a proxy for institutional quality, reflecting factors including openness to trade, legal respect for property ownership, and freedom from corruption.

Study Three. Limits on strategy development: double-trouble in Asian markets - You can still fight with one hand tied behind your back.

This study (Douglas 2010b) addressed the dual impacts of ownership and institutional factors, and served as a pilot study for the methodology adopted in this research. IATA (Pearce 2009) argues for liberalisation on the basis that regulation is best limited to addressing market failure, and that regulation in aviation should be limited to air transport safety and security. Advances in liberalisation have occurred within Europe, between Europe and North America, and in Australasia, but the industry remains constrained by ownership and traffic rights structures established in the Chicago Convention of 1944 (ICAC 1944).

Given ongoing regulatory constraints, the purpose of this study was to understand the impacts an airline’s ownership and the level of economic freedom in its home country. Furthermore the study considers how these factors impact on an airline’s financial performance and its strategic behaviour. The aim of the research was to analyse the performance of airlines in the Asia-Pacific region where a broad range of ownership models and government behaviour can be observed. The broad hypothesis was that an airline could achieve an adequate economic outcome with one external impediment (either state ownership or a home country with limited economic freedom) but not with both.
The airline industry has suffered a number of disruptions in the past decade, from the September 11th 2001 attacks in New York to the SARS epidemic in East Asia. To avoid the impact of these external events skewing industry performance data in an unfavourable economic environment, the years 2006 and 2007 were chosen for the study. These represent years of relative stability and profitability for the industry with an aggregate net profit of $US 5 billion over the two years (Pearce 2009), and an operating margin near 4%, representing the highest margin and only industry-wide profitability since 2000.

Hamel and Prahalad (1990) found that strategic intent varies from business to business, while the Resource Based View (Barney 1996) predicts that different airlines will use their resources and competencies differently. Some airlines enjoy significant factor advantages (Porter 1990), operating in advantageous locations with significant connecting traffic opportunities, lower labour costs, and fewer constraints on competition. Others operate in more difficult circumstances with higher costs, more remote markets, or high levels of competition and little protection. All airlines attempting to recover their cost of capital, regardless of their factor conditions, face similar structural limitations in the industry.

The hypotheses tested in this preliminary research study are:

H1 – State ownership of an airline will be negatively related to operating margin

H2 – Airlines based in countries with high economic freedom will achieve higher operating margins

H3 - Airlines in less free economies where governments have controlling ownership will produce the poorest returns in the industry.

The study was undertaken in two stages, with operating margin (gross operating profit divided by operating revenue) adopted as the measure of airline financial performance.
Each airline’s operating revenues and operating costs, drawn from the database assembled for this research, are aggregated for the years 2006 to 2007 in order to smooth short-term aberrations in performance. Complete data was not available for several carriers, including Vietnam Airlines, Eva Airlines, and Royal Brunei, and these airlines were excluded from the study. Indian new entrant Kingfisher Airlines was also excluded as it was in the start up phase of its operation in 2006. The reports are compiled in US dollars. No adjustment was made for foreign exchange impacts, as the major currencies in Asia and the Euro traded in a narrow band against the US dollar over the study period, and as many airline costs including fuel, aircraft leases, and overflight charges are in any case routinely denominated in US dollars. The short time series avoids the problem of spurious regression where a high coefficient of determination (R²) without a significant relation among dependent and explanatory variables can arise simply from the existence of a trend in more than one series of data.

Company annual reports, the Centre for Asia-Pacific Aviation company profiles and Thomson Reuters were accessed for airline shareholding data. The share registers of several part-privatised Chinese and Southeast Asian carriers reflect large institutional holdings and limited free float trading potential. Turner and Morrell (2003) identified the reduced beta and consequently lower cost of capital for the airline industry that flows from these limits on free floats.

Testing of hypothesis one addressed the correlation between ownership and operating margin, by testing the relationship between state ownership and financial performance. Ownership is expressed as a continuous variable between 0-1. (0= total state ownership, 1= no state ownership).
For the second phase of the study, a measure of economic freedom was drawn from the Index of Economic Freedom published by the Heritage Institute and the Wall Street Journal (2009). This index was replaced in this present research by the Fraser Institute Economic Freedom of the World Index. The selection process for the index is discussed in Chapter Six.

Three specific measures within the Heritage Institute/Wall Street Journal index, business freedom, trade freedom, and freedom from corruption, were consolidated into a single index for countries in the Asia-Pacific region. The transition between lower and higher levels of economic freedom was positioned at 0.8, a clear break point in the index above which only developed economies are found and below which developing economies are positioned. The correlation between this index and operating margin was then tested.

With Operating Margin as the dependent variable, the relationship with ownership was tested by linear regression analysis. The result is a very weak relationship between the level of state ownership and an airline’s operating margin. Despite this poorly fitted correlation, it was evident from the data that no fully private airline delivered a negative operating margin result in the study period (though positive results were varied), while from the cluster of airlines in full state ownership, only Air New Zealand delivered a positive outcome. These results are presented in Figure 4.3.

Of particular note is the scale of the performance gap between state and private carriers in the Indian market, where Jet Airways delivers a 3.7% operating margin while state-
owned Indian Airlines, Air India, and neighbouring Pakistan International Airlines, deliver negative returns of between -10.6 and -11.1%.

Across the industry the correlation between ownership and return on sales is not strong, but the absence of loss-making stock market listed airlines and wider differences in performance between listed and State-owned South Asian carriers suggest that some element of the business environment is driving varied outcomes. The second hypothesis tested explores the impact of an airline's home base or nationality, and draws on Dunning's (1988) review and extension of the eclectic paradigm, where the potential impact of government is identified in the L (location) element. (1988:4).

Fig. 4.3 Asia-Pacific: Relationships between ownership and return.
Airlines based in countries where trade and business freedoms are high and where corruption is low (as measured by the economic freedom index), were expected to generate better operating margins than airlines based in less free economies. In this case linear regression analysis identified a significantly stronger degree of fit, with an $R^2$ value of 0.408 showing a significantly stronger relationship between economic freedom and operating margin than is found for ownership and operating margin.

As with the ownership analysis for hypothesis 1 that shows no fully stock market listed airline delivering negative operating margin results, no airline based in a country with a Freedom Index above 0.8 delivers a negative operating margin return. Results for the carriers in this cohort ranged from Japan Airlines at a return of 2.5% to Australian-based Virgin Blue at 12.5% (Fig 4.4). Differences in operating margin between listed carriers in the same country suggest that other factors including strategic intent, management capability, and the airline’s business model are likely to be impacting on outcomes.

![Graph: 2006/07 Asia-Pac](image)

Fig 4.4 Asia-Pacific: Relationship between economic freedom and return.
Hypothesis 3, that airlines in less free economies under government ownership will produce the poorest returns, combines the independent variables of ownership and institutional quality and was tested by compiling a composite measure of ownership and freedom. The highest R² was achieved where the weighting of ownership in the composite measure was reduced to 0.16, further indicating the influence of institutional quality on airline financial performance.

The result of the analysis in this study is support for the notion that you can fight with one hand behind your back but not two. Even in a positive period for the global airline business, the study's nine state-controlled Asia-Pacific carriers in lower economic freedom countries deliver a low 0.8% operating margin. Further, the analysis indicates that being based in a relatively free economy is more predictive of a strong operating margin than a stock market listing. Where both state-controlled and listed carriers operate in a single country (such as Malaysia or India), there is a marked difference in performance in favour of the non-state airlines.

The strongest airline performance is found in some of the most openly contested aviation markets. Australia and New Zealand allow fully foreign owned domestic carriers to operate, and both countries are served by low cost international operations. Australia's Qantas airline group bases its 49% owned subsidiary Jetstar-Asia in Singapore, where it competes alongside Singapore Airlines and Tiger Airways.

Results for the study are summarised in Table 4.2. As predicted, state-owned carriers in less free economies perform worst. This cluster barely delivered a positive operating margin in the industry's only profitable period of the past
decade. Listed airlines in lower freedom countries manage to equal the global average operating margin for the industry despite poorer institutional quality. Listed airlines in higher freedom economies outperform the industry average by 123%, but are surpassed by the two majority state-owned national carriers in Singapore and New Zealand.

<table>
<thead>
<tr>
<th>High Freedom</th>
<th>State ownership or control through state investment vehicles &gt;50%</th>
<th>&gt;51% of shares listed or held by private owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index values</td>
<td>Pragmatists</td>
<td>Free marketers</td>
</tr>
<tr>
<td></td>
<td>n=2</td>
<td>n=8</td>
</tr>
<tr>
<td></td>
<td>Operating margin = 6.6%</td>
<td>Operating margin = 5.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lower Freedom</th>
<th>Sufferers</th>
<th>Avoiders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index values</td>
<td>n = 9</td>
<td>n=8</td>
</tr>
<tr>
<td></td>
<td>Operating margin = -1.8%</td>
<td>Operating margin = 2.2%</td>
</tr>
</tbody>
</table>

Table 4.2 Interactions between ownership and institutional quality
4.2 Summary of the chapter

Within a series of studies completed in preparation for the research in this thesis, the impact of state ownership on the operating margins of airlines in Europe and Asia is quantified. Results are consistent with earlier research including Backx et al (2002) which addressed the performance of privatised airlines.

Study Three introduces an index of economic freedom as a proxy for institutional impacts, allowing the combination of ownership/privatisation and institutional/deregulation impacts to be studied concurrently. Study three covers a short time period, but provides the basis for the theoretical model of this research by identifying the apparent significant compounding of downward pressures on operating margin when both state ownership and institutional pressures are at play.

The results of these studies, and in particular study three, provide support for IATA’s campaign for greater deregulation of international aviation. The more deregulated and open markets deliver stronger operating margins regardless of factor advantages. Indeed Air New Zealand’s margin performance and product innovation focus in a difficult and highly competitive location conforms to Porter’s (1990) assertion that difficult competitive environments can drive companies (and countries) to develop new factor advantages.

The research focus on the Asia-Pacific region in a profitable period is extended in this thesis to compare geographic regions and to identify the outcomes in the arguably more
common situation of low industry profitability. The model adopted in preliminary study three can be readily applied to both extensions, with revenue and margin data available for much of the airline industry, and an updated Index of Economic Freedom available annually. For the ASEAN region moving along its pathway to economic integration, much more is likely to be achieved from greater deregulation than from moves to privatise the current predominantly state-owned flag carriers.
Chapter Five
Conceptual Background

The purpose of this chapter is to provide general overview of the research structure, to introduce the research questions, and to provide a framework for analysis. Despite the fact that airlines have been operating as commercial entities for ninety years, and despite a process of deregulation beginning in the 1970's, the industry continues to generate returns below the cost of the capital employed. The residual ownership and route access regulations that limit cross border mergers and acquisitions ensure that, in striking contrast to the other globally connected industries including vehicle manufacture, mining, consumer electronics and petroleum products that are dominated by transnational corporations (UNCTAD 2002), the airline industry remains fragmented, predominantly at a national level.

Airlines seeking to build scale through mergers and acquisitions are limited to domestic competitors (e.g. Delta and Northwest in the United States) or intra-regional competitors inside the Europe Union (e.g. Lufthansa's acquisition of Austrian Airlines). Domestic mergers in Europe that would have seen chronic loss makers absorbed by stronger local competitors (e.g. Aer Lingus by Ryanair or Olympic by Aegean) have been overturned by competition regulators, even though the Irish and Greek domestic markets were notionally open to any European airline as potential competitors.

The industry's chronic failure to meet its cost of capital, and its fragmented structure, has not been impediments to continued traffic and capacity growth. The
demand for air travel has outstripped global GDP growth by a factor of more than 1.5 times (Tarry 2004). New capital continues to be invested to service this demand growth, despite the apparent destruction of wealth evident in the industry's long run financial performance.

Two business models adopted in the industry appear to be more successful than others, and these can be described within the Porter (1980) generic strategies. Full service airlines (predominantly the former national flag carriers) with globally connected networks, and a practice of constant product innovation generally capture premium yields, applying Porter's broad differentiation strategy and defending brand and product advantages. The other successful option is the adoption of disruptive business model innovation. This approach is widely deployed by new entrant low cost airlines that remain focused on short haul regional operations with simple fleets, product unbundling, and online distribution models. This model represents the application of Porter's (1980) narrowly-focused best-cost generic strategy.

More difficult is a focused differentiation strategy where airlines face competing without the benefits of global reach, and with little to differentiate their short haul flying from low cost competitors. Airlines attempting standalone low cost longhaul operations (a broad best cost generic strategy) struggle to achieve profitable operations without the support of connecting feeder traffic. This is underscored by the previously noted success of Air Asia X and Jetstar in the low-cost longhaul segment, with both airlines accessing large shorthaul networks able to generate connecting traffic flows. Airlines 'stuck in the middle' (Porter 1980) between the
generic strategies generally perform poorly, lacking neither the product innovation to maximise yields nor the lowest costs to allow competition on price.

The simple adoption of a preferred generic strategy position is not enough to maximise returns. Other factors impacting an airline’s operating margin identified in the preliminary research reported in Chapter Four include the airline’s ownership, and the quality of the institutional environment in its home country.

Nationality is critical to airlines because the regulatory requirement for bilaterally agreed traffic rights makes it practically impossible for an airline with international longhaul operations to shift country without sacrificing its access to markets and routes. Where regional deregulation has taken place (e.g. Europe and Australasia) local airlines have been able to expand to bases in other countries within the deregulated region. The ability to establish multiple bases facilitates the interconnected networks of low cost carriers more so than the hub-based radial networks of full service longhaul airlines that are more likely to rely on bilateral traffic rights for route access, and the strength of the hub for market presence.

Having established in the preliminary studies that institutional quality has a significant impact on airlines, this research sets out to answer two general questions:

1. To what extent is the effectiveness of airline strategy, as measured by operating margin, impacted by those institutional factors?

2. Does state-ownership of an airline alter that Institutional impact?
This chapter discusses the research questions, key variables, emerging research hypotheses, conceptual frameworks, and the nature of the international air travel business. The research questions are presented in Section 5.1. Key variables for developing the conceptual frameworks are outlined and then the conceptual framework is established in Section 5.2. The conceptual framework is detailed in Section 5.3, with tentative hypotheses developed in Section 5.4. Industry conditions are reviewed in Section 5.5, with the entire chapter summarised in Section 5.6

5.1 Research questions

The general research questions listed above introduce a series of sub-issues that are addressed by the following problems/problematics. These are listed below:

- Are there different operating margin outcomes achieved between airlines that are in full as opposed to majority (>51%) state ownership?

- Where an airline has majority rather than full state ownership is there a correlation between the size of the residual non-state share and the airline’s operating margin performance?

- Does the institutional quality in airline’s home country impact both state-owned and non-state carriers similarly?

- Has the emergence of airlines operating the low cost (LCC) business model impacted upon the return on invested capital (ROIC) of full service network carriers (FSNC)?

- Is any impact on the FSNC by the LCC consistent between geographic regions?
• Do airlines operating within the LCC business model achieve better ROIC outcomes than their FSNC competitors?
• Does any combination of ownership and institutional variables improve or worsen the operating margin performance of airlines?
• Will continued privatisation or deregulation of aviation markets improve the financial performance of the industry?

5.2 Summary of the key variables

The key variables in this study include operating margin, ownership, economic freedom, business model, scale, and nationality. This section provides a definition of these key variables as well as the measurement techniques used in the study.

The principal variable addressed in creating the theoretical model for this research is operating margin. Operating margin (also sometimes described as operating profit or earnings before depreciation, rentals, interest, and tax) is one of the few measures broadly available for the airline industry, and it allows airline performance to be compared regardless of operating model or ownership structures (Morrell 2007). Shifts in operating margin reflect the changing ratio of unit revenue to unit cost, and along with liquidity, fuel cost management and asset utilisation, operating margin is a measure of airline financial health and earnings performance (Lowry 2009). These various measures appear in the annual reports of stock market listed companies, but are less reliably available from state-owned, private, or hybrid companies which have no obligation to report financial data (e.g. Qatar Airways). The broad availability of operating revenue and operating cost data to calculate operating margin made this ratio the most inclusive measure to compare state and non-state airlines in the study. As a
measure of financial performance it provides a quantified yardstick to compare the long run success of airlines’ decision making. A ratio can be used with airlines of any size, and permits the aggregation of financial results for categorised clusters of carriers (e.g. all state-owned airlines).

5.2.1 Ownership

Airline ownership ranges from fully state-owned through mixed state-private ownership to stock market listed and privately held carriers (Morrell 2007). In 2007, over 110 airlines were listed on global stock exchanges (Reuters 2009), including the largest carriers in Europe, North America, Asia and Australia.

Through the nineteen year study period, airline privatisation included major national flag carriers in Europe and the Asia-Pacific region. Airlines including Qantas, Lufthansa, Air France, KLM, Alitalia and Olympic Airlines moved through ownership structures where state privatisation agencies or treasuries held significant stakes. Privatisation is less extensive in Southeast Asia, where Singapore Airlines, Malaysia Airlines, Thai Airways International, Royal Brunei, and Vietnam Airlines retain significant state ownership and control.

Airlines including Thai International and Malaysia Airlines that are partly privatised are also characterised by large institutional holdings, leaving a small proportion of the shares in a free float. A free float describes that portion of the shares that are freely available to the investing public and not held by large owners and institutions (Gibson and Morrell 2004, Turner and Morrell 2003). Others airlines in Asia, including Philippine Airlines and Eva Airways are principally held as subsidiaries of larger
corporations. Airline ownership data was collected from a range of sources including Thomson-Reuters for inclusion in the study database. In addition to representing ownership as a continuous variable, a categorical variable separating state and non-state ownership of airlines was added to the database.

5.2.1.1 Hybrid ownership structures

The literature is inconclusive on the outcomes of partial and total privatisation. An extensive literature review of privatisation studies by Megginson and Netter (2001) found evidence of long term improvement in the performance of firms following privatisation, while Vaaler and Shrager (2009) argue that residual state ownership leads to improved performance, at least in countries with policy instability. This inconsistency is evident in Asia-Pacific airlines, with state-controlled Air New Zealand and Singapore Airlines generating regular profits while similarly owned Malaysia Airlines is significantly less profitable. Backx et al (2002) and Chang et al (2004) identified the impacts of ownership and control on airline performance, finding significantly more efficient asset utilisation, higher employee productivity, and better return on sales for privately held airlines than for state or hybrid ownership. The variable research findings open both the opportunity for further study and the likelihood that a factor other than ownership is at play. Vaaler and Shrager’s (2009) observations on policy instability directed this present research to include a measure of the level of economic freedom in an airline’s home country as a proxy for institutional impacts.

5.2.1.2. Ownership changes over time

Ownership structures evolve over time, particularly for fast growing low cost carriers such as EasyJet, Ryanair, or Virgin Blue where family or initial investor stakes are sold down as the business becomes established. These carriers along with Philippine
Airlines, Air Asia, Korean Air, Asiana Airlines and Eva Airlines are notable for large family or individual holdings. Ownership and the shareholding structure of the airlines in the study was gathered from company annual reports sourced through Thomson Reuters, and from the Centre for Asia-Pacific Aviation company profiles. Ownership is expressed as the percentage of shares held by non-state investors and reflects the major shareholding position reported in company annual reports at the end of each financial year.

5.2.1.3. Limited trading and small free floats

Several Chinese and Southeast Asian carriers where state shareholding has been reduced in part privatisations retain large institutional holdings and limited trading potential (Thai International 2010). It is not the intention of this research to revisit the determination of appropriate risk premiums or capital asset pricing for an airline investment, or to speculate on the causes for the volatility of airline betas, nor to determine the optimal capital structure (mix of debt and equity funding) and Weighted Average Cost of Capital for airlines, an area addressed by Turner and Morrell (2003). The financial analysis conducted here serves to identify changing operating margins, and to identify the trends and patterns in ownership change over time.

Turner and Morrell (2003) investigated market betas for a range of major listed air carriers, expecting the relatively risky airline business to produce betas greater than 1, and probably in the range 1.2-1.4. Their findings did not support this assumption, and despite the volatile profit performance of the industry, its exposure to external shocks, and the lengthy capital investment timelines, the betas were lower than would be predicted by finance theory (Gibson and Morrell 2004, Turner and Morrell 2003). Low volumes of share trading were noted as a factor in the lower than expected pricing of
market risk for the sector, with trading of airline shares very rarely exceeding 1% of an airline’s stock on any trading day.

Research on the betas of the two listed carriers in Taiwan (Liu 2004) supports this finding. The existence of large holdings by mutual funds, families, state investment agencies, and in some cases other airlines, that can leave a small free float, offers some explanation for the low trading volumes.

Finance theory indicates that the market expects higher returns for shareholders taking on greater risk, which at its most basic requires that a rational investor would expect a higher rate of return proportionate to the increase in the risk of an investment (Sharpe 1964:425). Risk comes in two forms: systematic risk (beta β) which broadly represents the difference between market returns and a risk free (government bond interest) return; plus unsystematic risk that relates to particular firm’s circumstances (Markowitz 1952, Levinson 2006). Investors eliminate unsystematic risk by diversifying their portfolios (Levinson 2006). A firm’s beta value is an indicator of systematic risk and reveals the sensitivity of individual stock returns to changes in the returns of market portfolio of securities (Levinson 2006). Since the beta addresses the firm’s equity cost it is a component of the weighted average cost of capital (WACC).

5.1.1.4. Weighted Average Cost of Capital

For the purpose of assessing an adequate operating margin, this research adopts Turner and Morrell’s (2003) average government bond rate of 5.1% and an equity risk premium of 4.5% giving an equity cost of 9.6%. A neutral debt to equity ratio of 1:1 (indicative of Qantas and Cathay Pacific) is also assumed. This implies a WACC of
7.6%, which is consistent with the WACC identified by IATA (Pearce 2009) and by Turner and Morrell (2003) and Gibson and Morrell (2004). In Section 6.2.2.1 Lufthansa's WACC calculations are considered, and the benchmark WACC for this research is set at 7.9%

5.2.2 Operating costs

Comparison of profitability data between airlines is complicated by ownership and funding structures where capital structures and costs may be partly obscured in state investment agencies and sovereign wealth funds (MEED 2008). More reliable comparisons can be found at an operating level where cost and revenue data is available through industry databases such as the International Civil Aviation Organisation (ICAO) and the industry journal Air Transport World (ATW).

Aggregated industry data is routinely published in United States Dollars (USD). The impact of exchange rate movements is mitigated by major airline cost items including fuel, distribution, and aircraft leases or purchases being transacted in US dollars.

For this study, operating costs reported to ICAO reflect all direct and indirect costs related to operations, marketing, distribution, maintenance, catering, and corporate administration. Excluded costs are depreciation, aircraft rentals and leases, interest payments, and taxes.
5.2.3 Operating revenues

Operating revenues, reported in US dollars, include payments for the carriage of passengers, freight, and mail; revenues from ancillary services including baggage fees, inflight purchases, priority seating and boarding fees, block space seat purchases; and revenues from contracted airport handling. Excluded are interest earnings and extraordinary gains (losses) on asset or fuel and currency hedging transactions. The ICAO and ATW source data separate revenue into passenger, freight, and ancillary services, but these were aggregated into total operating revenue to be matched with the consolidated operating cost data.

5.2.4 Business model

Airline business models for the study are defined as full service network carriers (FSNC) and low cost carriers (LCC). Full service network carriers operate diverse fleets and offer complex network connectivity usually through a small number of hub airports, with coordinated schedules linking multiple destinations through the hub. Many of these carriers belong to large global marketing alliances, with market broad product offerings including premium cabins and loyalty programs (Holloway 2003). Low cost carriers predominantly operate shorthaul linear or loose grid patterns with little focus on schedule co-ordination (Holloway 2003:375). A single aircraft type is common, with LCCs gaining a cost advantage by turning aircraft quickly at airports, by operating in less expensive regional airports, and by minimising the complexity of the customer service on offer.

Hybrids of these models noted earlier in this thesis have emerged in recent times, with some low-cost carriers attempting long haul operations, and venturing into more
complex product offerings. Several of these failed as fuel prices rose in 2008, including Oasis Hong Kong and Zoom (Douglas 2010a). Less common has been the conversion of traditional full-service carriers into low-cost operators, a move undertaken by Aer Lingus in Europe (Douglas 2009). This shift requires a change in business model by unpicking the complex network carrier model, rationalising fleet and routes, and shifting emphasis to online distribution. Removing embedded legacy practices and breaking existing customer and distribution relationships is arguably more difficult than starting with a clean sheet. Union agreed staffing levels, legacy reservation systems, less dense aircraft configurations, and ‘grandfathered’\(^{10}\) slots at more expensive major airports are hurdles facing an airline attempting to reposition as a low cost carrier.

Conversely, Virgin Blue in Australia has begun a shift away from its LCC origins by adding full service international operations, multiple aircraft types and premium seating on shorthaul aircraft, and ultimately by rebranding the airline in early 2011. In repositioning its generic strategy from focused best cost towards broadly differentiated (Porter 1980) Virgin Blue risked being stuck in the middle. The low cost segment was opened to competing carriers Jetstar and Tiger Airways, while Qantas remained strong in the premium market with high frequency, strong corporate relationships, and a global network.

Unit cost does not define an airline’s business model. This is because unit costs decline with stage length (as airport handling and distribution costs are spread over a greater journey distance), allowing some full service network carriers with long average stage lengths to achieve similar unit cost outcomes to short haul low

\(^{10}\) Congested airports manage access through the allocation of runway and terminal slots. Once an airline obtains a slot, normal practice is for that slot to be retained in subsequent seasons under ‘grandfather’ rights, provided that the airline has made use of the slot in the preceding season.[Numbering change thru full document]
cost airlines. Rather, business model is defined by the airline’s adoption of either a differentiated full service model or a price/cost competitive LCC model (Porter 2009).

5.2.5 Scale

For inclusion in this study, airlines had a minimum annual revenue of $US 100 million reported for at least one year of available data. This level of revenue can be achieved by operating a fleet of four narrow-bodied (Airbus A320/Boeing B737) aircraft flown at a daily utilization of 10 hours with LCC yields of US 8 cents/Revenue Passenger Kilometre and with a passenger load factor of 75%. Average load factors have strengthened as revenue management capabilities have improved, but rarely exceed 80% in the long run. Declining yields have been forcing an increase in the load factor required to achieve breakeven (US DOT 2003).

While many carriers generate revenues above $US 1 billion annually, the industry remains fragmented with even the largest United States and European network carriers generating less than 4% of the total industry capacity (IATA 2008). Merger activity in Europe has seen Air France and Dutch carrier KLM merged (along with associated carriers Alitalia and Brit Air), although they are still operating separate brands. Swiss, Austrian, and British Midland were brought into the Lufthansa Group (along with Germanwings, and Brussels Airlines) but again these are still operating separate brands. The merger of British Airways and Spanish carrier Iberia is progressing on the same basis. The result is a consolidation into three major holding companies in Europe, but with the retention of state-based hub
networks for the component airlines, albeit with more coordinated schedules, codeshared flights, and integrated frequent flyer schemes (Buyck 2011).

Despite this European merger activity there appears little short term potential for cross border airline mergers or acquisitions within the Asia-Pacific region. ASEAN states’ traffic rights remain bilaterally based despite a pathway to air transport liberalisation whereas the Qantas sale act requires a majority shareholding of Qantas to be retained in Australia (Australian Government 2009). The Northeast Asian market has not yet made progress towards regional integration beyond the cross shareholdings between Chinese mainland and Hong Kong SAR airlines.

5.2.6 Economic freedom

The preliminary studies outlined in Chapter Four demonstrated that ownership alone did not explain variances in airline performance. While Backx et al (2002) were able to demonstrate superior financial outcomes for privatised airlines during a period of stable profitability for the airline industry, a broader review of the privatisation literature by Megginson and Netter (2001) points towards national policy stability as a key factor in the performance of privatised firms, particularly in the short term after privatisation. Peng (2000) offers three strategies for privatised firms. These are, muddling though with minimal change; raising capital from financial markets which requires a change in emphasis towards investors’ interests; and corporate restructuring, where Peng (2000:140) identifies the temptation to find ‘creative solutions to avoid or at least delay the pain of restructuring’ for firms in transition economies.
Gwartney et al (2006) drew together three theories on underlying cross-country differences in incomes and growth. These are neo-classical theory (Solow 1956), geographical location (Diamond 1997, Sachs 2001) and an institutional environment supportive of markets (North 1990). Gwartney et al (2006) suggest that these are identified as contributing to an understanding of the differences in income levels and growth rates between countries, and are ‘not logically inconsistent’ in that they all contribute to building that understanding (Gwartney et al 2006:255). In terms of this study, the recognition that factors beyond the relatively narrow scope of neo-classical economic modeling can be useful in building understanding is important. The relationship between institutional quality and business performance through its institutional impacts on both the level and productivity of investment underpin the comparative analysis in this research.

5.2.6.1. Economic freedom indexes

Two indexes of economic freedom were considered as measures of institutional impact on investment and performance. The eponymous Heritage Foundation - Wall Street Journal Index of Economic Freedom produced by the conservative United States-based Heritage Foundation, and the Economic Freedom of the World (EFW) index produced by the Fraser Institute, a Canadian public policy research organisation. Each index adopts a different methodology, with the EFW addressing a broader range of variables. Both hold a different philosophical position, with the Fraser Institute aiming for independence in funding and analysis while the Heritage Foundation is placed politically to the right of centre. Notwithstanding the differences in methodology and philosophy, the country rankings of both reports are highly correlated. For the 2007 data the correlation co-efficient is 0.89,
and for the smaller data set of the geographic regions included in this study, the
correlation co-efficient is 0.93.

<table>
<thead>
<tr>
<th>Year = 2007</th>
<th>Heritage Foundation</th>
<th>Fraser Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Score</td>
<td>65.19</td>
<td>70.96</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>9.87</td>
<td>7.00</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>0.93</td>
</tr>
</tbody>
</table>

Table 5.1 shows the correlation between the Heritage Foundation and Fraser
Institute economic freedom indexes.

The high level of correlation removed the need to merge or moderate the two
indexes. The Economic Freedom of the World (EFW) Index was adopted for this
study due to its longevity. Gwartney et al (2006:258) argue that:

> Several attributes of the EFW index make it attractive as a measure of
> institutional quality. It is a comprehensive measure. It includes many factors
> that economists have historically argued would facilitate economic activity
> and enhance growth. Because it is an actual measure of institutional quality
> rather than a proxy, it directly provides some direction for policymakers.
> Perhaps most important, the data are available at five year intervals over a
> period of several decades.

The data set is normally distributed. In building the theoretical model, the
threshold for higher economic freedom is set at the 75\textsuperscript{th} percentile of the EFW
dataset. This point represents the median point for a modified ranking of
countries, retaining only those countries with airlines represented in the research
study. If the full dataset median had been retained, only fifteen of sixty-one
countries would have remained in the lower freedom grouping.

5.2.7 Nationality

As already identified in the discussion of scale, the airline industry remains
fragmented along national lines. Even for regional groupings such as the European
Union, the constraints of air service agreements have seen merged and acquired
airlines (e.g. Air France-KLM) continuing to maintain nation-based operating
companies. Consequently, airlines remain hosted in and subject to the institutional
quality of their home state. The nationality of a carrier, and the economic
conditions prevailing in the home country, are therefore identified as significant
factors in the theoretical model.

Within Europe, the creation of a single aviation market has allowed European
carriers to treat flights within Europe as domestic services. Full implementation of
the single aviation market was achieved with three pieces of legislation embodied
in the third aviation package effective from January 1993 (European Commission
2011). The third package included three legislative measures:

1. The introduction of harmonised requirements for an operating
   licence for EU airlines (Council Regulation (EEC) No 2407/92),
2. The open access for all EU airlines with such an operating
   licence to all routes within the EU (Regulation (EEC) No 2408/92). At
   the same time, national governments have the possibility to impose
public service obligations on routes which are essential for the regional development, and

3. The full freedom with regard to fares and rates was also introduced (Regulation (EEC) No 2409/92). Airlines are no longer required to submit their fares to the national authorities for approval.

Burghouwt and Hakfoort (2001) and Burghouwt, Hakfoort and Van Eck (2003) found that European national carriers retained and in some cases, including British Airways Finnair and Scandinavian Airlines increased the focus on their home-based hub networks following the third package deregulation. The need to consolidate longhaul connecting traffic at an airport from which these carriers had traffic rights underpinned this retention of home based hubs. Conversely, low cost carriers such as Ryanair and EasyJet whose business model eschews longhaul intercontinental flights have made effective use of the liberal intra-Europe market by establishing loose grid multi-base operations (Holloway 2003).

In Southeast Asia the ASEAN single market is not yet fully in place. Carriers seeking to expand operations beyond a national base have been forced to establish subsidiary airlines. For example, Malaysian carrier Air Asia pursued expansion with the establishment of minority stakes in subsidiary units in Thailand and Indonesia, while the Qantas group has entered the ASEAN market by establishing Jetstar-Asia in partnership with Singaporean shareholders in order to access traffic rights from Singapore. More liberal domestic environments exist in Australia and New Zealand where foreign owned airlines may operate pure domestic (cabotage) services. Singapore-based Tiger Airlines took this opportunity to establish a domestic subsidiary in Australia, while Australian carriers Qantas, Jetstar, and
Pacific Blue have operated domestic services within New Zealand in line with the 1996 Single Aviation Market, the Australia-New Zealand Open Skies Agreement signed in 2002, and the 2006 Civil Aviation Legislation Amendment (Mutual Recognition with New Zealand) Act that permits New Zealand carriers to operate domestic services within Australia while remaining governed by New Zealand safety standards (ICAO 2007).

Ownership of United States carriers remains tightly constrained by ownership regulations. Rationalisation of the large United States carriers through domestic mergers rather than cross border acquisitions has often built revenue scale and hub dominance rather than cost reduction (Van Riper 2010). The inability to merge over national boundaries has been a key driver for the development of alliance partnerships between full service network airlines in different geographic regions. This created expanded global schedules and recognition programs that met high yield customer expectations of global connectivity from airlines adopting a broad differentiated generic strategy (Porter 1980).

5.3 Conceptual framework

The literature review has shown that the airline industry can be described within a range of competitive strategy models. Further, there are at least two effective business models defined within the Porter (1980) generic strategies where airlines achieve profitability despite the poor long run performance of the industry. Several airlines adopting narrow best cost strategies, limiting their operations to flights below four hours and avoiding the costs of connectivity and complex fleet structures, have achieved substantial scale successfully in Europe (e.g. Ryanair), in
Southeast Asia (e.g. Air Asia) and in North America (e.g. Southwest). Several
differentiated airlines offering broad international networks, premium product
innovations, and extended alliance networks have also achieved growth and
sustained profitable operations. These include Hong Kong based Cathay Pacific,
Singapore Airlines, Australian carrier Qantas, and Germany's Lufthansa. The
literature has also shown that the constraints imposed on aviation by its historical
regulatory structure keep airline companies predominantly nationally based.
Although Europe had the opportunity to learn from the United States deregulation
(Button 1996), this national focus has underpinned an operating structure of home
country radial networks, even where deregulation had begun and airlines have
been privatised (Burghouwt et al 2003).

While North American carriers have typically built several hubs across the
continent, European carriers have predominantly stayed with home based hub
operations. Low cost carriers in both regions, and in particular Southwest Airlines
in the United States, have built large interconnected rather than hub based route
structures (Reynolds-Feighan 2010). LCC competition in Asia by comparison has
been constrained by regulatory barriers that limit the region's airlines to networks
based out of their country of ownership. This constraint limits the introduction of
interconnected networks that are employed by their European and North
American peers, even where liberalised 5th freedom traffic rights are available
(Reynolds-Feighan 2010).

Even with the privatisation and deregulation achieved so far, the airline business
in 2011 remains heavily constrained by limits to market access. It will be shown
later that the industry has made little headway in reducing the aggregate level of
state ownership, with new state-owned airlines in the Middle East offsetting
privatisation in Europe and Australasia. State ownership and control has persisted
in Southeast Asia, with the majority of the region's flag carriers, including
Singapore Airlines, Malaysia Airlines, Thai International and Vietnam Airlines
retaining majority or full state shareholding.

The tensions facing airline managers that are anticipated in the research are
identified in Figure 5.1, which illustrates with the key measure of operating
margins is expected to be constrained both by institutional pressures and
disruptive competitive behaviours.

Fig. 5.1 Management tensions in airline strategy formation.

Despite the industry's chronic failure to recover the cost of capital employed
throughout the business cycle, it continues to grow at a rate in excess of 1.5 times
GDP (Boeing 2010). This indicates a significant departure from the rational profit-
maximising behavior of neo-classical economics (Keen and Standish 2006), and reflects the impacts of external factors on tactical and strategic decision making undertaken by airlines. Shareholders persist with investment in fleet growth in an industry that has high capital requirements, is vulnerable to external (particularly fuel) cost fluctuations, and is constrained from consolidation by nationality requirements of market access. The industry operates in a market where free trade principles (open skies) exist on an opt-in rather than an opt-out basis, under a regulatory framework designed in 1944 when governments attempted to create a market for the interstate exchange of traffic rights.

Ongoing state ownership and regulation of airlines suggests that the gap between profit maximisation (or at least the recovery of the cost of capital employed) and actual financial performance may have an institutional link (Eckel et al 1997). The research in this study addresses this financial performance gap by studying the operating margin performance of airlines under state or private ownership, under higher or lower institutional quality, and by separating business the model in line with the Porter (1980) generic strategies.

Morell (2007) and Holloway (2003) identified the complex financial structures in place in airline companies, the various forms of aircraft ownership, and a wide range of taxation rules across many nation states. To address both these complexities and the limited data available in the research dataset, operating margin was adopted as the measure of airline financial performance. Operating margin is calculated as:
Operating Revenue – Operating Cost

Operating Revenue

Analysis of institutional impacts requires a proxy measure. Consequently the Economic Freedom of the World Index (EFW) compiled by the Fraser Institute in Canada was adopted to represent institutional impacts on airline companies. The rationale for selecting the EFW index is found in Section 5.2.6.1.

Airline generic strategies (Porter 1980) are widely self-identified by the airlines. The LCCs proclaim their price leadership and the FSNC promote network connectivity and services (differentiation). European airlines that transformed from charter operators and airlines with a single fleet type and little opportunity for hub connectivity are classified in this research as LCC. Unit costs or units revenue are avoided in defining business models, as yields and unit costs diminish as sector length increases (Morrell 2007). This impact of diminishing yields over increasing distance can create paradoxical positions where a FSNC with long average sector lengths such as Virgin Atlantic may have unit costs and unit revenues (yields) that are lower than a low cost airline flying predominantly one (1) hour sectors, because airport costs and the fuel burnt climbing to cruising altitude are similar to those for longhaul flights, but are apportioned over a much shorter journey. The yield from a ‘cheap’ $50 LCC fare between Kuala Lumpur and Singapore if applied to a long haul journey between Singapore and London would generate a one-way fare of $1,833.
5.4 Tentative research hypotheses

Following an inductive approach, tentative hypotheses were developed as the research progressed. The comprehensive review of the literature and the preliminary studies reported in Chapter Four identified a range of key factors to the research including:

- The constraints of path dependency. Incumbent full service network carriers demonstrate a capacity to match competitive product innovation, but exhibit difficulty in addressing disruptive business model innovation;
- The limits imposed by regulation and nationality requirements on market entry and route selection. Intra-regional deregulation took place independently of inter-regional changes, restricting the ability of airlines (particularly in Europe) to move away from home base hub structures;
- The effect of an uneven pace of deregulation and privatisation on industry consolidation and restructure. Deregulation in the United States took place in a market devoid of state-owned airlines, while pre-deregulation Europe and the Asia-Pacific region were largely made up of state-owned flag carriers. As Europe and Australia privatised airlines and new state-owned airlines emerged;
- The emergence of large state-owned airlines in the Middle East. Fast growing state-owned airlines in the Arabian Gulf have kept the proportion of airline capacity in state hands static, and introduced new FSNC to the industry;
- The impact of institutions on financial performance. The preliminary studies tested a model based on cross-tabbed categorical variables that
identify the impact of both state ownership and institutional quality on airline operating margins, and

- The long run failure of the airline industry to deliver an adequate return on invested capital. The fragmented industry with its regulatory barriers and institutional impacts consistently falls short of the rate of return required to service its substantial capital base.

A series of tentative hypotheses were derived from these factors.

5.4.1 Emerging ownership related hypotheses

Studies of the effect of ownership on airline profitability are limited. As noted earlier, Backx et al (2002) provides an analysis of a short period following several major airline privatisations, but this has not been extended to study the longer run impacts. Given the expectation that privatised businesses will perform more profitably the following three ownership hypotheses are proposed:

1. That airlines in full or significant State ownership will achieve poorer operating margins than those airlines that are privately held or have a majority of their stock listed on the stock exchange (Ownership Hypothesis OH 1),

2. That a difference in operating margin will be related to the proportion of shares traded freely (Ownership Hypothesis OH 2), and

3. That the gap in performance between state-owned and private carriers will be greater in years of economic downturn where the total industry performs poorly (Ownership Hypothesis OH 3).
5.5.2 Emerging institutional quality related hypotheses

Authors including North (1990), Peng (2003) and Gwartney et al (2006) identified the significance of institutional factors and investment climate on company performance. The Fraser Institute (2009) Economic Freedom of the World index (EFW) was selected to test the following hypotheses:

- That airlines in countries with a higher economic freedom index score will achieve better operating margins (Institutional hypothesis EH1),
- That state ownership in countries with high levels of freedom is not an impediment to achieving adequate return on capital (Institutional hypothesis EH 2), and
- That private ownership in countries with lower levels of economic freedom cannot overcome the impact of a poorer institutional environment (Institutional hypothesis EH 3).

5.4.3 Emerging inter-relatedness of ownership and economic freedom hypotheses

Preliminary Study Three which was reported in Chapter Four tested the use of cross-tabulations in interpreting the study database. The cross-tabulation categories adopted were the state ownership and economic freedom index scores. These categories are applied again in this research. Illustrating:

- that the combination of state ownership in excess of 50% when combined with lower levels of economic freedom limits an airline’s
operating margin to a point close to breakeven (Interrelation hypothesis IH 1), and

- that a poorer operating margin will be achieved even in years of robust economic growth where the industry is performing strongly (Interrelation hypothesis IH 2).

These hypotheses can be considered within the following framework.

<table>
<thead>
<tr>
<th>State ownership or control through state investment vehicles &gt;50%</th>
<th>50% + of shares listed or held by private owners</th>
</tr>
</thead>
</table>
| **High Freedom Index values >0.75th percentile**             | **Hands off.**
State owners limit or refrain from direct intervention in business decisions. Business environment encourages transparency. |
| **Profit maximisers.**
Companies maximise shareholder value and economic returns. Business environment offers transparent regulation and processes. |
| **Lower Freedom Index values <0.75th percentile**             | **Meddlers.**
Objectives of state owners rather than financial performance drive fleet and network decision making. Business environment may have corrupt practices and weaker property laws. |
| **Avoiders.**
Operate in environments where state intervention in markets and corruption can limit performance for all firms |

Table 5.2. The research framework developed in the preliminary studies
5.5 Airline industry conditions

5.5.1 Increasing volatility

Since 1997, the airline industry has faced the Asian economic crisis, the September 11th 2001 terrorist attacks, the outbreak of SARS in 2003, the enabling of LCCs with Internet-based distribution, and the rapid escalation of fuel prices, before slumping into a global recession in 2008. The financial performance of the United States airline industry after 2000 has been poor, marked by larger carriers seeking bankruptcy protection to restructure (Borenstein and Rose 2007) and beginning a consolidation process through mergers of the largest airlines. More recent results from the consolidated industry have shown a more muted increase in capacity growth and improved margins for the United States carriers. This is consistent with the finding of Keen and Standish (2006) that more fragmented industries are likely to drive financial performance towards a position where marginal revenue equals marginal cost.

Building on Backx et al (2002) this study considers a significantly longer post-privatisation period for major European and Asia-Pacific airlines and therefore encounters greater volatility. Backx et al (2002) applied industry data to assess the performance of a selection of state-owned, hybrid, and privatised carriers over the five year period from 1993-1997. Even in this benign period with sound economic growth, improving aircraft efficiencies, the recapitalisation of firms preparing for privatisation, carefully staged deregulation in Europe and Australasia, and an absence of major external shocks either politically or economically driven, a
poorer profit, return on sales and return on assets outcome was achieved by airlines totally or partly state-owned (Backx et al 2002).

5.5.2 Airlines as national champions

Since the 1970's governments in Southeast Asia have used airlines to support national development, facilitate technology transfer, grow inbound tourism industries, and underpin major infrastructure construction, such as major hub airports (Bowen and Leinbach 1995, Bowen 2000, Chin 1997, Leinbach and Bowen 1994, Mahani et al, 2005). Under this structure, Singapore Airlines, Thai Airways International and MAS grew to become significant international players (Tham 2008). Most ASEAN national flag carriers retained large government stakes, even as the industry was privatised in other parts of the world. Malaysia Airlines returned to majority state ownership in 2002 after an unsuccessful privatisation exercise (Khairiah 2008), while Myanmar Airways International and the now defunct Royal Air Cambodge struggled to operate profitably with external investors.

The focus on growth and development has not always delivered profitable operations, with the ASEAN flag carriers' strategies developed in a state of tension between the competing aims of profit maximising and nation-building pressures. A similar development pattern is now underway in the Arabian Gulf. Airlines including Emirates, Qatar, Etihad, and Oman Air are growing rapidly nurtured by state support, and with large hub airport investment to support their growth.
The Middle East carriers' growth strategy, and in particular that adopted by
Emirates Airline, differs from the earlier approach taken in Southeast Asia (Bowen
and Leinbach 1995, Bowen 2000). The focus of the Middle East carriers is strongly
skewed towards hub connectivity and less towards developing inbound tourism.
The availability of late 20th century longer range aircraft places Europe, East Asia,
Africa, Australia, and even much of North America within a single sector flight of
the Gulf States. This facilitates levels of global connectivity not available to
Southeast Asian Airlines that were leveraging state funded infrastructure to
support growth in the 1970's.

The Middle East-based airlines also vary from their Asian peers in the
development of networks without drawing on alliance partners. The large Asia-
Pacific carriers (including Malaysia Airlines from 2012) joined the three global
airline alliance groups, allowing virtual network extension by marketing partner's
flights. Emirates, Etihad and Qatar have adopted rapid fleet and network
expansion as an approach to achieve sufficient scale on their hub and spoke
networks (Nero 1999).

5.6 Summary of the chapter

This study aims to improve our understanding of the impacts of state ownership
and of institutional quality on airline financial performance by testing a conceptual
framework. Relationships implied by the conceptual framework and the research
hypotheses provide a foundation for analysing the research questions. The
conceptual framework focuses on the relationship between operating margin,
partial or full state ownership, a constrained or more free home base economy,
and the emergence of new business models positioned within the Porter (1980) generic strategies framework.

Indeed, Porter (2008) has puzzled over the continued investment in airlines despite the obvious lack of adequate airline profitability for several decades. He has even described airlines as ‘one of the least profitable industries known to man.

Porter’s analysis was echoed by the United States investment expert Warren Buffet in a press interview in 2002 where he wryly remarked:

..... that if a capitalist had been present at Kittyhawk back in the early 1900s,[he] should have shot Orville Wright. He would have saved his progeny money.

\[\text{But seriously, the airline business has been extraordinary. It has eaten up capital over the past century like almost no other business because people seem to keep coming back to it and putting fresh money in.}\]

\[\text{You've got huge fixed costs, you've got strong labor unions and you've got commodity pricing. That is not a great recipe for success (Buffet quoted in The Melbourne Age, 22 September 2002).}\]

This chapter has reviewed the key variables of operating margin, ownership, and economic freedom. It has also identified emerging research hypotheses focused on the impacts of ownership and institutional quality as well as the interaction of these factors on airline operating margin. A conceptual framework that draws on the Porter (1980) generic strategies underlies a series of research questions that explore the interrelationship of ownership and institutional impacts on airlines, and that can potentially explain the financial performance of the international airline industry in aggregate as well as in clusters of airlines identified by ownership, business model, geographic region, and the quality of institutions in the airline’s home country.
Limitations on the availability of comprehensive airline financial and load data, particularly for airlines without the obligation of regular stock market reporting have been accommodated in the design of this research by the adoption of Operating Margin as a measure of airline operational performance. Data for this ratio can be accessed for the largest number of airlines over the length of the study. Operating revenue and operating costs are provided by a large number of airlines through the International Civil Aviation Organisation annual data reports and are published by at least two widely read industry journals. These are Air Transport World and Airline Business. A number of government civil aviation agencies, including India, China and the United Kingdom also publish the data collected for ICAO reporting. This broad range of publicly accessible information provides adequate data to assemble a comprehensive database of airline revenues, costs, and operating margin.
Chapter Six
Research Methodology

The purpose of this chapter is to describe the research design and methodology used in this study. The chapter is divided into five sections. The research paradigm is reviewed in Section 6.1, with measures adopted in the study outlined and explained in Section 6.2. Justification of the research method is addressed in Section 6.3. Analysis tools and reliability measures are discussed in Section 6.4. Augmentation of the database with additional categorical factors is reviewed in Section 6.5, and finally the impact of ownership change on organisational performance is considered in Section 6.6.

6.1 Research paradigm

6.1.1 A post-positivist paradigm

This research adopts a post-positivist paradigm, seeking to find causal explanations for observations made of the subject (the international airline industry) over time. Miller (2000:60) in describing the post-positivist paradigm identified the difficulty in finding a research method isolated from human values. Miller also noted that value-free objectivity is an ideal rather than a requirement for the post-positivist paradigm. Contrasting the post-positivist and positivist positions, Miller (2000:61) sees that the post-positivist’s responsibility is to ‘use methods that strive to be as unbiased as possible’ and to ‘attempt to be aware of any values that might compromise neutrality’. The position is ‘less dogmatic’ than
the positivist paradigm that requires researchers to bring an independent and
detached approach to understanding causality.

A criticism levelled at the requirements of the positivist approach is that it can lead
to research that lacks richness and depth (Lincoln and Guba 1985, Patton 1990,
Strauss and Corbin 1990, Guba and Lincoln 2005). Post-positivist research, with its
less dogmatic approach, can adopt an inductive reasoning process where the
research design evolves, and where the questions to be asked and the data to be
collected can emerge in the process of doing the research (Lincoln and Guba 1985).
Such an inductive approach is adopted in this research, allowing the three
preliminary studies reported in Chapter Four to both shape the final research
questions, and to test and validate the industry database analysed.

Inductive research begins with observations and patterns, and through the
development of tentative hypotheses seeks to build a generalisable theory either
from the broad patterns of the research (Creswell 2003:132, Trochim 2000) or by
linking the research outcomes to past experience or literature. Eisenhardt (1989b)
identifies the role of a priori constructs, that is, logic or understanding that exists
prior to the research, in providing better focus and grounding for a research task.
In this research this grounding is achieved by applying knowledge of the
commercial airline industry gained through extensive professional experience to
better shape and direct the process, and to seek causal explanations for the
observations made.

Eisenhardt (1989b:533) albeit considering the use of case studies to develop
theory, urges careful selection of the research population to 'focus efforts on
theoretically useful cases - i.e., those that replicate or extend theory by filling conceptual categories'. The objective of this careful selection is to constrain extraneous variation and ultimately to sharpen the external validity of the research (Eisenhardt 1989b).

6.1.2 Comprehensive data

This research draws on a comprehensive dataset containing over 90% of the operating revenue and cost data for the airline industry in Europe, the Middle East, and the Asia-Pacific region over the nineteen-year timeframe of the study. The small portion of missing data represents minor regional airlines that provided incomplete reporting, or airlines that failed within their early years of operation and did not report at least three years of financial results. The large North American market was excluded from the study. The United States aviation market has never included a state-owned airline segment, and the region includes only two countries, both of which have high levels of economic freedom. The scale of the large North American non-state carriers, for whom the substantial United States domestic market arguably shapes strategy, would be likely to distort observations of changes occurring in other regions as deregulation and privatisation are pursued. Deregulation in the United States took place in the 1970's and analysis of that market would place a deregulated environment alongside the deregulating markets in Europe, Asia, and Australasia fifteen years later.

The exclusion of Africa on the other hand was based on the small and fragmented structure of the industry, and substantially incomplete reporting of the necessary data in that region. Sampling of the data was not considered for this research.
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structure of the industry, and substantially incomplete reporting of the necessary 
data in that region. Sampling of the data was not considered for this research.
Sampling within populations that have already been chosen for theoretical reasons is unusual (Glaser and Strauss 1967, Eisenhard 1989b). In any case, industry-wide data for the comprehensive and inclusive dataset compiled for this study was available, and was as easily analysed in its complete form as it would have been as sample data. Avoiding the need for sampling avoided the risk of researcher bias arising in the sampling process (Miller 2006:61).

The primary focus of this research is to identify the relationships between airlines' ownership structures, home country economic freedom, and business model; and to quantify the effectiveness of airline strategies by measuring (the dependent variable of) operating margin. Further, the research aims to determine the responsiveness of these variables to changing economic conditions, to business model innovation, and by drilling down through the data to identify responsiveness at a regional level. This geographic segmentation allows the research to identify the impacts of regional policy differences. Europe is well advanced with privatisation and deregulation that is supported by legislation. Southeast Asia is at the early stages of regional aviation deregulation positioned within the consensus structure of ASEAN, while Northeast Asia (where China’s aviation industry is growing rapidly) has not yet developed a regional framework (Oum 2006, Oum and Lee 2002).

By comparing economic freedom, ownership, and business model variables, the study aims to address the outcomes of industry deregulation policy, and the impacts of the privatisation of state-owned carriers under varying levels of institutional quality.
6.1.3 The airline industry's history of poor profitability

The problem of poor profitability in the airline business is not a recent development, but has been reported for over twenty years. Return on equity is consistently poor (IATA 2009, Morrell 2007:59). The industry has the unenviable reputation of destroying significant economic value. Porter's (2008:83) analysis of return on invested capital for industries in the United States identifies airlines (generating 5.9%) as the poorest industry, sitting well below the United States’ average of 14.9%. Porter (2008:85) identifies price driven rivalry as particularly destructive of profitability 'because price competition transfers profits directly from an industry to its customers'. The airline industry displays most of the factors that Porter (2008) identifies as drivers of price based rivalry. Price cuts are easily matched, customers pay less attention to product features (that are often nearly identical) than to price, and switching costs are low.

6.1.4 Growth continues despite poor returns

Airline capacity continues to grow, with new market entrants and existing carriers investing in new aircraft capacity where demand expands at a rate greater than global GDP growth (Tarry 2004, Morrell 2007:2). Industry unit costs have fallen in real terms (Tretheway 2004) as airlines implement new technologies, deploy more efficient aircraft, and capture lower online distribution costs. Average load factors have grown steadily from 1990 (Morrell 2008:7) but as Porter (2008) notes, airlines almost invariably hand the savings back to the customer.
6.2 Measures adopted in the study

6.2.1 The use of latent variables

The database constructed for this research consolidates a range of industry data. This consolidation provides a broad cross section of the industry, and allows the tensions between economic and institutional drivers in the setting of airline strategy to be studied. The institutional drivers, captured through both ownership structure and the economic freedom index, address the impact of implicit or explicit obligations imposed by state ownership and host country nationality on the airlines studied (Verdier 1995).

There are no direct measures of airline institutional impact or of the quality of airline strategy. Where factors or constructs cannot be measured directly, indirect measurement by means of observable indicators (latent variables) becomes the option (Vermunt and Magidson 2004). Latent variables are applied in this study to explore institutional quality and strategy effectiveness. The available latent variables include an economic freedom index (itself a consolidation of various factors of political, legal, regulatory and trade freedoms) that addresses the underlying variable of institutional quality; and airline operating margin, a measure of operational effectiveness that addresses the underlying variable of effective strategy.

Strategic effectiveness can be assessed when operating margin is combined with an airline’s asset turn ratio to calculate the return on invested capital. Both operating margin and asset turn ratios are quantifiable, and are observable over time. This approach to the assessment of airline strategic effectiveness has been adopted.
6.2.2 Returns on invested capital

In Chapter Five it was established that, while airlines have the same requirement as other industries to service their cost of capital, this requirement is consistently (annually) unmet (IATA 2006). IATA addressed this long run shortfall by calling for industry liberalisation (Pearce 2008). An intended outcome of this research is to provide input to the liberalisation policy debate, and to provide greater clarity in evaluating the roles of privatisation, industry deregulation and host country institutional quality.

In establishing an acceptable return on capital for airlines, research (including Gibson and Morrell 2004, Morrell 2007, Pearce 2008) addressed the market risk premium for airlines. Similarly, the Lufthansa Group Annual Report for 2009 provides a template for the calculation of the weighted average cost of capital (WACC). Amongst the largest consolidated FSNC groups and responsible to a broad shareholder base for its performance, Lufthansa’s WACC approach is adopted in this study as being a useful example of a fully privatised stock market listed carrier. The Lufthansa group of airlines represents (in 2011) 24% of the capacity generated by Association of European Airlines (AEA) member carriers. The AEA includes 36 of the region’s full service airlines, but excludes Europe’s large LCC operators including easyJet and Ryanair.

Lufthansa’s approach is consistent with that of Pearce (2008) and Gibson and Morrell (2004). Lufthansa’s passenger group WACC target of 7.9% (Lufthansa 2009) for the four years from 2006-2009 is also consistent with the IATA target of
7.5% for the eight years 1996-2004. Lufthansa (2009) constructed its passenger airline group’s WACC of 7.9% for the four years from 2006-2009, with the following parameters:

- Risk-free market interest rate 4.2%
- Market risk premium 5.7%
- Beta factor 1.1
- Proportion of debt:equity 50:50
- Cost of equity 10.5%
- Cost of debt 5.4%

The gearing of the airline (that is its debt to equity ratio) plays a key role in establishing the cost of capital, as it determines the share of relatively more costly (risk priced) equity in the funding mix. Airline debt to equity ratios are addressed in the calculation of WACC in this research.

Several Asian airlines are structured with debt:equity ratios above 90:10. This higher proportion of debt would be expected to produce a lower WACC, and can also reduce agency issues between shareholders and managers (Kapil 2011:304). Once debt levels become high, however, interest rates can increase to reflect the lender’s perceived increased risk of default. High levels of debt can also impose pressure on the business to generate adequate cash flows to meet regular interest payments (Kapil 2011). Philippine carriers PAL and Cebu Air, and Indian carrier Kingfisher Airlines are three highly geared airlines in the dataset, but are small in scale and have little impact on the study. The balance sheets of these three airlines carry less than $140 million of aggregate debt (Thomson Reuters 2010).
6.2.2.1 Measuring operating margin mitigates inconsistencies between states

Establishing the WACC, effectively the cost of funds for commercial airlines, establishes a benchmark for the measurement of operational effectiveness. To avoid extra complexity, this paper assumes (following Dews Hawkins and Horton 1992) that the cost of equity, the cost of retained earnings, and the cost of new shares are equal. This research also recognizes that differential tax rates between jurisdictions can impact on the effective cost of funds. Consequently, the analysis adopts the pre-tax measure of operating margin (that also excludes depreciation and rentals) to assess the relative capacity of airlines to generate an adequate operating surplus to meet the industry benchmark WACC identified by IATA (2006) and adopted by Lufthansa (2009).

6.2.2.2 Asset turn provides the link between operating margin and WACC

Linkage between an airline's WACC and its operating margin (the latent variable for airline strategic effectiveness) can be established by addressing the airline's asset turn ratio. Where assets are employed more efficiently a smaller asset base is required. When an efficient asset turn is achieved by a firm with an efficient debt:equity ratio, the firm's WACC can be met with a lower operating margin. The calculation of the required minimum operating margin is addressed in the following section. Those airlines unable to generate an operating margin that services their WACC are effectively destroying shareholder wealth.

6.2.3 Establishing a benchmark minimum operating margin (MOM)
Establishing the Minimum Operating Margin (MOM) for this study provides a reference point for measuring the financial performance of each category of airline in the study. State owned airlines can be contrasted with privately held carriers, geographic regions can be compared, and the impact of the low cost business model on full service airlines can be assessed.

6.2.3.1 Deriving the minimum operating margin

Once the WACC, airline gearing, and asset turn ratios have been established, a minimum required operating margin (MOM) can be calculated by dividing the WACC by the asset turn. For example, a business with revenues of $1 million and an asset turn of 1.0 would have $1 million of assets employed in the business. To meet a WACC of 8%, the business would require a minimum margin of 8%. If the assets were employed less efficiently or the business had greater capital intensity, the asset turn would be lower. The same $1 million revenue in a business with an asset turn of 0.5 would require a margin of 16% to achieve the same return on capital invested.

Table 6.1 demonstrates the impact of Asset Turn as an efficiency ratio (Moyer McGuigan and Kretlow 2009). Low asset turn can indicate either the inefficient use of assets or an industry with constrained profitability. Asset turn and capital structures for this study were sourced from the annual reports of all stock market listed carriers in Europe and the Asia-Pacific region accessed through Thomson Reuters. Capital structures and asset turns vary by airline. This is recognised in Table 6.1 with sensitivity analysis for debt:equity ratios from 1:1–2:1 and asset turns from 0.3 – 0.7.
The asset turn sensitivities cover (at 0.3) the ratio achieved by low cost carriers, while ratios between 0.5 - 0.7 address the performance of FSNC airlines in Asia and Europe. The Debt to Equity ratios of between 1:1 to 1:2 addressed in the sensitivity study are common in the airline industry. The study demonstrates that the industry's recorded range of asset turn ratios has a significantly greater impact on WACC than the reported range of debt:equity ratios.

<table>
<thead>
<tr>
<th>Asset Turn</th>
<th>Debt:Equity 1:1</th>
<th>Debt:Equity 2:1</th>
<th>WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset turn 0.70</td>
<td>10.5%</td>
<td>9.5%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Asset turn 0.65</td>
<td>12.2%</td>
<td>10.9%</td>
<td></td>
</tr>
<tr>
<td>Asset turn 0.50</td>
<td>15.8%</td>
<td>14.2%</td>
<td></td>
</tr>
<tr>
<td>Asset turn 0.30</td>
<td>26.3%</td>
<td>23.7%</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.1 Minimum operating margin sensitivities to asset turn and gearing

6.2.3.2. Regional variations in gearing and asset turn are balanced

Analysis of the 2008-9 financial statements of stock market listed airlines in Europe and the Asia-Pacific region reveals higher asset turn ratios but lower gearing ratios for airlines in Europe and Australasia than for Asian carriers. Modelling (incorporating these European and Asia-Pacific gearing and asset turn ratios) identifies a similar minimum operating margin requirement for both regions, with the higher gearing rate in Asia offset by the lower asset turn achieved by Asian airlines. The results of the modelling are presented in Table 6.2.
<table>
<thead>
<tr>
<th>Region</th>
<th>Asset turn</th>
<th>Debt:Equity</th>
<th>Implied Minimum Operating Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe – non UK</td>
<td>0.82</td>
<td>37:63</td>
<td>10.5%</td>
</tr>
<tr>
<td>Europe UK</td>
<td>0.78</td>
<td>34:64</td>
<td>11.2%</td>
</tr>
<tr>
<td>Asia – non China</td>
<td>0.57</td>
<td>80:20</td>
<td>11.2%</td>
</tr>
<tr>
<td>Asia - China</td>
<td>0.49</td>
<td>82:18</td>
<td>12.9%</td>
</tr>
<tr>
<td>Australia/NZ</td>
<td>0.73</td>
<td>50:50</td>
<td>10.9%</td>
</tr>
</tbody>
</table>

Table 6.2. Implied Minimum Operating Margin by Region of Airline Ownership.

Source: Thomson Reuters

6.2.3.4 Benchmark minimum operating margin

Based on the analysis completed in this section and the industry comparisons, the benchmark MOM for the study is set at 11%.

6.2.3.5 Airlines with higher MOM requirements

Significantly higher MOM requirements for Singapore Airlines, Air Asia and Ryanair emerge in the study. These are a consequence of the very low debt to equity ratio (9:91) of Singapore Airlines, and the low yielding fare levels that are achieved by the two large low cost airlines. Low cost airlines generate both lower unit costs and lower unit revenues. As their aircraft ownership and operating costs are similar to full service airlines. A similar percentage of 'profit' per ticket for a low cost airline generates a smaller nominal value. The impact of the low fare/low cost model on asset turn is demonstrated in Table 6.3.
An A320-200 narrow body short-range jet typical of those deployed in the fleets of both LCC and FSNC operators is modelled over a 1,000km flight segment. An identical operating margin (in this case modelled at 11.8%) can be delivered for both the LCC and FSNC airline. In achieving an identical Operating Margin, the FSNC carrier generates both costs and revenues approximately 50% greater than the LCC carrier, even where the aircraft has fewer seats and a lower load factor.

The result is a 50% higher nominal value of the operating surplus achieved by the FSNC. As both airlines are using an identical aircraft, ownership costs are similar, leaving the FSNC with a higher operating surplus to apply against the same asset value. Applying an expected asset turn of 0.74 times to the FSNC, where the operating margin is identical for both carrier types produces an asset turn of only 0.49 for the LCC model.

Airbus A320-200 over 1,000km flight sector.

<table>
<thead>
<tr>
<th>A320-200</th>
<th>Business</th>
<th>Economy</th>
<th>FSNC -Total</th>
<th>LCC -Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seats</td>
<td>12</td>
<td>150</td>
<td>162</td>
<td>180</td>
</tr>
<tr>
<td>ASK = 1,000km</td>
<td>12,000</td>
<td>150,000</td>
<td>162,000</td>
<td>180,000</td>
</tr>
<tr>
<td>Unit cost excl fuel</td>
<td>0.080</td>
<td>0.030</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
<td></td>
</tr>
<tr>
<td>Unit cost c/ASK</td>
<td>0.120</td>
<td>0.045</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Op Cost $</td>
<td>1,440</td>
<td>6,750</td>
<td>8,190</td>
<td>5,400</td>
</tr>
<tr>
<td>Seat factor %</td>
<td>75</td>
<td>81</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>RPK's</td>
<td>9000</td>
<td>121800</td>
<td>153000</td>
<td></td>
</tr>
<tr>
<td>Average fare $</td>
<td>220</td>
<td>60</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Yield c/RPK</td>
<td>0.22</td>
<td>0.06</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Revenue $</td>
<td>1,980</td>
<td>7,308</td>
<td>9,288</td>
<td>6,120</td>
</tr>
<tr>
<td>Operating profit $</td>
<td></td>
<td></td>
<td>1,098</td>
<td>720</td>
</tr>
<tr>
<td>Operating margin</td>
<td></td>
<td></td>
<td>11.8%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Asset turn</td>
<td></td>
<td></td>
<td>0.74</td>
<td>0.49</td>
</tr>
</tbody>
</table>
Table 6.3 Modelling of FSNC/LCC Asset-turn ratio

The option available to the LCC in this scenario is either to increase its aircraft utilisation to exceed the FSNC average by 50%, a difficult target to meet where the business model demands shorter sectors and is often constrained by airport curfews from overnight flying; or to increase the income from fares and ancillary sales by 50% and lift the operating margin towards 18%.

These pricing and utilisation measures, delivered either alone or in combination to achieve the higher 18% Operating Margin, would bring the LCC in line with its FSNC competitors to recover the target 7.9% return on capital invested.

6.2.3.5 Network efficiency

The airline business is asset intensive, using complex aircraft with operating lives that approach twenty years. Aircraft utilisation is impacted by network efficiency. Constraints on connections, airport curfews, and aircraft turnaround times impact on the trip-availability of the fleet. Boeing Airplane Company analysis (Mirza 2008) indicates that the average network efficiency for FSNC airlines is 60%. That is, the constraints on utilisation consume 40% of the time that an optimised aircraft could otherwise be expected to fly revenue services. The LCC model is able to generate network efficiencies up to 20% greater than FSNC (Mirza 2008:18) allowing LCC airlines to spread ownership costs over the greater flying hours.
The 20% efficiency premium for LCC is well short of the 50% differential modelled in table 6.3, and illustrates the challenge facing LCC to raise the remaining 30% shortfall in revenue per seat from higher seat factors, increased fares, or ancillary charges. Seat utilisation approaching 80% is common for the industry, suggesting that while the asset turn is poor for LCC (and at times not significantly stronger for some FSNC e.g. China – see Table 6.2), low asset turn is not usually a consequence of low aircraft or seat utilisation, but of poor pricing margins. These poor pricing margins are consistent with Porter’s (2008:85) analysis of price driven rivalry.

6.2.3.6 High MOM projections.

Singapore Airlines (SIA) has the lowest gearing of any major carrier in the study, with a debt:equity ratio of 09:91. The consequence of SIA’s very conservative gearing and moderate asset turn of 0.57 times per annum is a MOM projection of 17.6%. The significance of this higher MOM is identified in Section 7.2 of the research results.

Higher MOMs were also identified for Malaysian LCC Air Asia, and European LCC Ryanair. With a low asset turn of 0.27 per annum and a 3:1 gearing ratio, Air Asia’s MOM projection is 24.7%. A similar structure and MOM applies for Ryanair. Both carriers achieve industry leading unit costs, and generate volume business with aggressively low pricing. The impact of the low cost model on the required MOM was addressed in Table 6.3. Where these variations are likely to impact on results they are discussed in Chapter Seven.
6.3 Justification of research method

The preceding sections have developed and explained a range of measures and benchmarks to be applied in this study. This section justifies the method adopted to apply those measures and benchmarks to the dataset developed for this research.

A pragmatic approach has been adopted for this research. A pragmatic approach permits the researcher to embrace the freedom to use any methods or techniques typically applied in quantitative or qualitative research. The pragmatic researcher adopts the view that any method has limitations, and that it is possible to get effective outcomes through the complementary use of different methods.

The pragmatic approach adopted also recognises that more than one outcome is possible (Smyth 2007), and that inconsistencies over time or between geographic regions or ownership models may emerge. In developing the discussion, general events may be found that are not always replicated, or that are impacted by their context. Situations may change so that some prior events identified in the data are no longer likely to be replicated. This opens the possibility of explanations emerging from the quantitative analysis of the research that describe the historical conditions researched, but that cannot be broadly generalised into the future. Liberalisation within the European Union and trans-Atlantic markets, the different political and legal structures of ASEAN, the absence of a similar pan-regional body
addressing aviation regulation in Northeast Asia, and the political structures of the Middle East, will also limit the replication of processes or changes between regions.

The present research described here is an observational study (Rosenbaum 2005) that draws on an extensive longitudinal dataset to investigate and explain the consistently poor recovery of the cost of capital by airlines. Observational studies are undertaken where experiments are not feasible or cannot be undertaken for ethical reasons. Rosenbaum (2005:1452) cautions that care should be taken in the design of an observational study to attempt to reproduce, as nearly as possible, some of the strengths of an experiment.

An experiment involves the systematic manipulation of an environment and subsequent observation to determine if a systematic change occurs. A requirement of experimental research (Leedy and Ormrod 2005) is that the situation created by the researcher can be repeated to carry out the experiment on multiple subjects. In the commercial aviation environment, the strategy and management of a cluster of airlines could not be systematically manipulated to create differing outcomes for observation. Because experimental research would require its design to follow deductive logic (Hawthorn 2009), and test manipulation of the environment to prove the truth or otherwise of specific premises, experimental research was discarded for this study.
Experimental research would also have required data collection over a much shorter timeframe than the nineteen years addressed in this research, and would have eliminated the opportunity to study the impact of ownership changes and strategic inflections (Grove 1998) over time. Having discounted a deductive experiment, an inductive study of the industry data was adopted that seeks to build a good argument around the emerging premises, and to provide, with some degree of strength, support for the conclusions (Hawthorn 2009).

The comprehensive data set and operating margin measure of this study are elements that could as readily be incorporated in the design of an experiment, if feasible conditions existed. Data from correlational research can be used to interpret cause and effect in terms of the theoretical framework developed in this research, but correlational data cannot conclusively prove causality (Shuttleworth 2008). One strength of this study is that it addresses, on a broad scale, the performance of an industry, with the industry’s own data, and with an ‘insider’s’ understanding of the issues. This not only provides rich and comprehensive data but, at the conclusion of the research allows the findings to be presented to the industry in its own context using its own data.

The preparatory study (Douglas 2010b) established the effectiveness of cross-tab analysis in explaining differences by ownership and economic freedom within a two year segment of the database. The model developed in the preparatory study is used for the more extensive research addressed in this and subsequent chapters. A series of sensitivity measurements is included in the study to validate the
consistency of the model under different economic condition, in different
geographic regions, and under different business models. These are reported in
Chapter Seven.

6.3.1 Developing a consistent framework

The preliminary studies reported in Chapter Four affirm that the theoretical framework
(addressing ownership and institutional factors) is broadly consistent with both the
institutional and competitive strategy literature addressed in Chapter 2 and Chapter 3.
That is, the studies demonstrated that the major business models within the airline
industry can be described and positioned within Porter’s (1980) generic strategies, and
the industry’s competitive behaviours accounted for under Lengnick Hall and Wolff’s
(1991) Resource Based View. This consistency of the model with the literature
contributed both to the framing of tentative hypotheses to extend the analysis, and to the
prospect of a robust theoretical outcome consistent with the post-positivist paradigm,
where pattern and regularity in causal relationships are assumed (Miller 2000:60). The
model is also consistent over time.

The dataset consolidated the available factors. Hair et al 1998 note the risk of
specification errors when significant but unreported causal factors are not
included in the research. The researcher’s industry experience (a posteriori
knowledge) and a priori knowledge are relied on to identify key available factors.
More comprehensive data including load and traffic statistics are available for
some carriers in the study, but limiting the research to airlines with more
comprehensive data would have imposed bias on the research by skewing data
collection towards non-state carriers with more onerous stock market reporting
requirements. This would have skewed results and failed to support the analysis of
the key research questions around state-ownership.

A parsimonious approach to analysis was taken. A parsimonious approach
requires the simplest plausible model with the fewest possible number of
variations (Hair et al 1998:24). Increasing the number of variables introduces the
risk of spurious correlation with other related variables, or that factors are auto-
correlated over the time series. Autocorrelation describes the occurrence of
correlation between values of the same process over different points in time as a
function of the two times or the time difference (Keller 2009:716).

Seasonal variations within years were avoided by the use of annual data, but cyclic
patterns of profitability occur in the airline industry that relate (in part) to changes
in GDP growth. This growth is often in turn impacted by crises and disruptions
(e.g. the World Trade Centre attacks in New York in 2001). Aircraft orders and
operated capacity also respond to this cycle, but the lag in delivery time can leave
airlines receiving new aircraft at times of economic downturn (McArthur 2010). It
is recognised that the ability to manage fleet flexibility and delivery timing is not
captured in operating margin, but its impact is identified in the asset turn ratio
that was captured for all listed airlines.
6.3.2 Background of the theoretical framework

The theoretical framework begins with the established failure of the airline industry to meet its required return on invested capital (IATA 2006) and draws on prior research (Turner and Morrell 2003, Morrell 2007) to establish the industry’s required return on capital. The development of the benchmark minimum operating margin to meet the required return on invested capital is explained in Section 6.2.

The research seeks to understand the relationship between several continuous and categorical variables and a single continuous response variable – operating margin. The requirement for a latent variable to measure strategic effectiveness and the limits on available data for the broadest possible cross section of airlines determined the selection of operating margin as the response (dependent) variable. Operating revenue and cost data is widely reported, and the ratio of revenue to cost captures the relative performance of airlines regardless of scale, business model, geographic location, reporting currency, ownership, or regulatory environment. Margin performance remains an equally valid measure as airlines grow (or shrink), restructure, or change ownership.

Correlation and regression analysis are effective tools available to analyse and identify causal relationships between variables within datasets (Hair et al 1998). Research can be undertaken with a range of purposes, and it may seek to provide description, prediction, or explanation of the subject (Shuttleworth 2008). Jackson (2006:18) draws together the research methods best suited to each purpose,
identifying correlation research as the most effective for the development of reliable prediction while also successfully describing behaviours. This research, in studying an extended time series, allows discussion and description of airline behaviours and the positioning of those behaviours within strategy theory outlined in Chapter Two and Chapter Three. Furthermore, the research has the possibility of providing predictions of changes that would be likely to occur in the industry if the regulatory framework was amended to free airlines from host country constraints on traffic rights.

6.3.3 Pearson's Product Moment Correlation Coefficient

Pearson's product moment correlation coefficient, usually denoted by $r$, (Hair et al, 1998:151) is a measure of the linear association between two variables that have been measured on interval or ratio scales. The coefficient reported can be misleadingly small when a relationship exists between the variables but it is a non-linear one (Hair et al 1998:151). There are occasions in this research where establishing that the relationship between two variables is not linear provides valuable information (Hair et al 1998:151) For example, the absence of a linear relationship between GDP growth and operating margin for LCC airlines helps to identify the drivers of the counter-cyclical strategy of that operating model, where low cost airlines engage in guerilla strategy (Lengnick Hall and Wolff 1999) during downturns to capture market share from full service competitors. The lower average costs of the LCC generally allow them to sustain services when the FSNC are reducing capacity as market growth shrinks.
6.3.4 Regression analysis

Lang (2007) identifies the most common types of regression analyses as:

- Simple linear regression, used to assess the relationship between a single continuous explanatory variable and a single continuous response variable that varies linearly over a range of values and
- Multiple linear regression, used to assess the linear relationship between two or more continuous or categorical explanatory variables and a single continuous response variable.

The research data were assembled into a an Excel spreadsheet and linear regression analysis was conducted in SPSS to test for a relationships between the dependent variable - operating margin - and the independent variables of ownership, economic freedom, nationality, and business scale. As predicted in the preliminary study, very low $r^2$ (0.02-0.21) results were achieved under various combinations of independent variables, indicating very low levels of explanation available from linear regression for operating margin using the independent variables tested. Regression analysis over an extended time series faces difficulties including the risk of autocorrelation (Keller 2009).

Most time series patterns can be described in terms of trend and seasonality. Trend represents a general systematic linear or (frequently) nonlinear component that changes over time and does not repeat, at least within the time range captured by the data. The annual demand for air travel is impacted by changes in GDP growth, but GDP growth is in turn impacted by events as diverse as wars,
pandemics, and terrorist acts, and reveals no consistent seasonal cycle. There is a long-run upward trend in GDP growth, and the time series is best described as a random walk with drift. (A random walk predicts that in a time series, the next value will be the current value plus a stochastic component (white noise)). A random walk does not revert to the mean but can move away in either a positive or negative direction. \( Y_t = Y_{t-1} + \epsilon_t \). A random walk with drift \( Y_t = \alpha + Y_{t-1} + \epsilon_t \) incorporates both a constant variance and a stochastic component and, while a constant has been identified, it shares the features of a random walk in that it does not revert to a long run mean.

It is usual for business measurements over time to exhibit some trend when expressed in their original units of measurement. Using the ratio of operating profit to operating revenue (operating margin) over the series removes nominal revenue growth trends, and leaves a pattern that, at first view, appears to exhibit the qualities of a stationary time series (Keller 2009:856). Closer analysis identifies operating margin as a random walk series trending lower but with a stochastic component to the variance, leaving both the dependent and a key independent variable as a non-stationary series. The unpredictable drift from the mean renders extrapolations from non-stationary data through regression analysis potentially unreliable (Nau 2011). While there are limits on the predictive ability of this research, its descriptive ability is strong.

Additional concerns include the possibility of missing factors (specification errors), including those factors identified for which complete data were not available. Changes impacting the industry include fuel prices rising more steeply than average costs; increasing average seat factors (percentage of seats occupied)
as revenue management systems improve; traffic mix variability between airlines; configuration density and configuration class mix variation. Other factors are; fleet mix – including the proportion of longer range aircraft; and operational constraints including aircraft scheduled beyond full payload range on commercially important sectors (e.g. Singapore-London). These factors form part of any airline’s strategy development, and the use of operating margin as a latent variable for effective strategy allows the outcome of these diverse variables to be measured for airlines and also for categories of airlines.

6.4 Analysis tools and reliability measures

Figure 6.1 outlines the analytical methodology followed in this research. The process captures both broad but general industry-level results used to define the core industry issues, and granular company-level data that was consolidated through categorical variables into contingency tables for analysis of business model, economic, ownership, and institutional quality factors. The reliability of the data refers to the extent to which consistent results are achieved when repeated measurements are made, when data is sufficiently complete and error free to be convincing for its purpose, and where it has a logical, sensible relationship to the finding it supports (Morgan and Waring 2004). There must be sufficient data to support the findings of the research. In this study the sufficiency is assured by collecting the extensive dataset containing 90% of the study target, rather than sampling. The analysis and findings are limited to the geographic regions of Europe, the Middle East, and the Asia-Pacific regions because these represent regions with combinations of ownership models and institutional quality, and with
reliable data. Cross matching between data sources and analysis of revenue and cost trends was used to correct errors in data loaded to the study database. The study database accurately represents the industry over the nineteen years of the study, and provides relevant and reliable data to support the analysis undertaken.

6.4.1 Comprehensive database

The dataset is comprehensive rather than sampled. This approach is appropriate where the population was already selected for theoretical reasons (Glaser and Strauss 1967, Eisenhard 1989b, Johnson and Turner 2003). Near complete industry data was available from the same sources that would have been used to obtain sample data (ICAO database and industry journals), and with fewer than two hundred airlines in the regions studied, the scale of the database was manageable. Analysing complete data eliminates the risk of sampling errors skewing results. Over the extended timeframe of the research a number of airlines in the study have changed ownership structure through privatisation (e.g. Lufthansa), and mergers (e.g. British Airways - Iberia). Several carriers experienced both privatisation and merger activity (e.g. Air France – KLM). Business model innovation has taken place with the entry of low cost airlines, and individual countries have changed institutional behaviours (as measured by the Economic Freedom Index). Had the industry data been sampled, heteroskedastic error patterns would have been likely to arise.

A dataset with both spatial and temporal dimensions can be described as panel data (Yaffie 2003). Consideration was given to treating the data set as panel data, but the panel is unbalanced as a consequence of randomly scattered missing data
points. Further a random effects model would have been required (Yaffie 2003) as many components of the study vary over time (e.g. airlines changed ownership, governments changed policy, business model innovation occurred). Considered together, the temporal and missing data issues militated against the use of panel data analysis.

The objective of the analysis was not to measure changes in industry level operating margin or to identify its correlation with the economic cycle. That analysis is widely available in IATA reporting and has been studied by various authors including Morrell (2007) and Tarry (2004). Rather this research seeks to identify the relative difference between categorised groups of airlines that are defined by ownership and economic freedom, and to identify the consequent impacts on strategy development and implementation. This requires recognition that the airlines are limited in their actions by regulatory constraints on international market access.

The dataset contains operating revenue and operating costs (reported in United States dollars) for 78 air carriers in Europe, 12 carriers in the Middle East-North Africa region, and 40 carriers in the Asia-Pacific region. The carriers included represent more than 90% of commercial airline revenue generated in the study regions over the nineteen year span of the study, giving the study database significant reliability. To assure accuracy, data values were matched between the ICAO and ATW data sources.

Operating revenues and costs were further checked by plotting line graphs for each airline to identify any sharp increases or downturns that might indicate data
errors. The same inflexibility of airline fleet and network structures that makes a rapid response to changing economic conditions difficult also militates against sharp changes in an airline’s revenue or cost in consecutive years allowing ready identification of input errors. Input errors created during the data loading were corrected prior to the analysis.

6.4.2 Consolidation by airline grouping.

In preparation for analysis, airlines are assigned categorical variables identifying ownership and home country economic freedom. The four categories of carriers to be created represent

- Lower freedom – State owned \( \text{LFSO} \)
- Lower freedom – non-State \( \text{LFNS} \)
- Higher freedom – State owned \( \text{HFSO} \)
- Higher freedom – non-state \( \text{HFNS} \)

Contingency tables (Hair et al) are used to display the frequency distribution of the study’s variables in a matrix format and are created in this research by using Microsoft Excel pivot tables. The database was constructed in a format that allows rapid analysis using sort fields. Pivot tables in Excel spreadsheets enable the rapid summing of data and the building of contingency tables. The categorical sort fields for the pivot tables include calendar year, GDP growth, ownership, economic freedom, and business model. One output from the pivot table analysis is a table of operating margin for the total study, and for each category of airline and for the total industry. An additional variable of GDP growth was added.
The absence of linear relationships renders linear regression generally ineffective in explaining the relationship between variables in the study, and this problem is amplified where time series data are involved and risks of autocorrelation arise. Other than the lack of a linear relationship between operating revenue and operating margin that allows the (revenue) scale of an airline to be discarded as a contributing factor to operating margin, linear regression offers little analytical value for this research.

6.4.3 Business model

In Section 6.2 asset turn is identified as an important measure in calculating the required minimum operating margin. Asset turn is sensitive to the business model chosen with low cost/low fare carriers generating lower asset turn rates as a consequence of their lower yielding business.

These business models are identified by a (FSNC/LCC) categorical variable in the dataset. This variable allows cross tab analysis to be drilled down to identify both the difference between business models and also the change in FSNC performance following the strategic inflection (Grove 1998) that occurred with the introduction of Internet selling and its enabling of the low cost business model innovation. Internet selling rationalised airline distribution by facilitating disintermediation. Customers were able to deal with airlines directly, replacing commission-based travel agents and costly Global Distribution Systems. Customers also took on the
task of creating the reservation and completing a credit card payment, removing much of the reservation cost for the low cost carriers.

The tension between the business models of LCC and FSNC airlines can be seen as competition between firms with differing resources and competencies (Wernerfelt 1984, 1995, Barney 1991, 1997, Priem and Butler 2001). For airlines, much of the heterogeneity usually responsible for competitive advantage is negated by the industry’s use of identical aircraft types, common airports, standardised in-flight service, and internationally managed air routes (Morrell 2007). The large cost items of fuel, maintenance, and aircraft ownership are very hard to differentiate, particularly for long haul airlines where aircraft utilisation and operational costs tend to be similar for all carriers. This reduces the factor advantage (Porter 1990) otherwise often enjoyed by firms based in developing economies where lower labour costs provide a substantial advantage in the firm’s cost base.

6.4.4 Institutional quality - Economic freedom group

Countries where the Economic Freedom of the World index score falls above the 75th percentile are categorised as higher freedom. Scores and categorisation are completed for each year of the study, allowing improvements or deterioration of a country’s ranking to be captured in the data. As noted earlier, the 75th percentile of the countries included in the study provides a suitable break point, with 42% of the airline revenue generated in the higher freedom states and 58% in the remainder.
6.4.5 GDP group

To allow the analysis of airline performance under varying economic conditions three GDP growth scenarios are established. Annual global GDP growth for the 19 years of the study is obtained from World Bank reporting. Average GDP growth over the study period is 2.94% with a standard deviation of 0.93. Lower and higher range scenario thresholds are set at one standard deviation from the mean.

The three scenarios are:

- Low range GDP growth: 2% or lower (5 years of the study database)
- Mid range GDP growth: 2.01-3.87% (10 years of the study database)
- High range GDP growth: 3.88% or greater (4 years of the study database)

6.4.6 Ownership group

Airlines with greater than 50% of their shareholding in the hands of investors that were not state agencies (including sovereign wealth funds) are flagged as ‘non-state’ and are referred to as non-state throughout the analysis and discussion.
6.4.7 Inter-regional differences

The data set also shows significant inter-regional differences in operating margin by ownership and economic freedom. Lang (2007) warns that when multiple hypotheses are tested on the same data, care must be taken to establish group equivalence by testing each baseline characteristic for differences between groups (hoping to find none). Inter-regional differences in the data are addressed by testing each hypothesis at a geographic region level. Analysis of inter-regional variances is addressed in the discussion of results.

6.4.8 Data collection

Addressing the approach to data collection in inductive research, Eisenhardt (1989b:533) identifies the value of multiple data sources in facilitating triangulation, speeding analysis, fostering divergent perspectives, and revealing helpful findings. In particular, a ‘flexible and opportunistic’ (Eisenhardt 1989b) approach to data collection allows investigators to ‘take advantage of emergent themes’ (Eisenhardt 1989b). This study has drawn data from a range of available sources to create the most complete and comprehensive dataset for the research.

6.5 Construction of the study database

The database for this research was assembled from two key sources. The Air Transport World Annual Report, available in electronic form for all years since 1990, and the International Civil Aviation Organisation (ICAO) database of revenue, load, and capacity performance, compiled electronically since 1973 which
consolidates industry revenue, cost, and load statistics. Both datasets were purchased for this research.

Reporting of financial results by airlines is not mandatory, and neither dataset is complete, but when merged and with some missing data points supplemented with reporting by government civil aviation agencies, a substantially richer dataset is available. Some remaining missing data points were calculated where subsequent year reporting included year on year growth rates, allowing the previous year’s value to be imputed. Additional information sources included carrier profiles compiled by the Centre for Asia-Pacific Aviation (CAPA), airline investor information web-pages, company annual reports, and news reporting accessed through Thomson Reuters. The starting point of the dataset in 1990 was defined by the availability of the Air Transport World (ATW) database.

6.5.1 Accessing the data

The initial data download from ‘ICAOdata.com’ captured the total operating revenue (passengers, freight, mail and ancillary) and operating costs in United States dollars. Limits of the ICAO data download tool required the data to be accessed on a regional basis, and consolidated in an Excel spreadsheet.

The ATW data was accessed from 18 annual report Excel spreadsheets covering the period from 1990-2007. Substantial reformatting of the spreadsheets was required to merge the data to into a single table. The results for 2008 were manually input from the ATW annual report published in the July 2009 edition of Air Transport World.
6.5.2. Consistency between the datasets

Airline reporting in home currencies requires the data provided to ICAO and ATW to be converted to US dollars. Small variances between the databases were anticipated from inconsistencies in currency conversion. Samples were drawn from a twenty airlines over a range of years to test the consistency between the ICAO and ATW datasets. High levels of consistency were found, ranging from 100% matching of results for airlines in China, to variations +/- 5% for European carriers. Importantly, the reported operating revenue and operating cost values are drawn from common reporting and share any minor exchange rate inconsistencies. Individual airline’s operating margins are not impacted by small exchange rate differences.

6.5.3 Merging data sets

Neither dataset was complete. Merging the two datasets substantially reduced the quantum of missing data points and increased the number of airlines in the study. Some missing data were sourced from national statistics offices including the Indian Directorate General of Civil Aviation. Finally, revenue and cost data for the Middle Eastern Airline Etihad were reconstructed from Abu Dhabi airport data and from Etihad press releases.

For several airlines only revenue data was available. As this gave no guide to operating margin these incomplete results were discarded. Over the life of the
study several mergers and re-brandings changed airline names. These airlines
were labelled with combined names in the dataset to retain the ownership record.

If after consolidation of results and the imputation of missing points, fewer than
three years of data were available for an airline in the merged database, the carrier
was removed from the dataset. The consolidated data table contains 131 airlines
and represents over 90% of industry revenues in the study regions. Of the major
flag carriers in Southeast Asia, only the data from Vietnam Airlines is missing. All
major flag carriers, charter airlines, and low cost carriers in Western Europe are
included. Data was less consistently available for carriers in the Middle East and
North Africa, with rapidly growing new entrants such as Qatar Airways not
reporting revenues or operating statistics.

6.6 Augmenting the dataset

Before analysis, the data table was augmented with additional categorical fields. These
were:

- Ownership – state or non-state
- Economic freedom – EFW index above or below the 75th percentile
- Combined ownership and economic freedom
- GDP – low/mid/high range of economic growth
- Business model – FSNC/LCC
- Region – Europe/Mid East/Asia-Pacific.

Numeric fields were added with economic freedom index values, and with annual GDP
data for each record.
6.6.1 Airline Ownership

Airline ownership structures range from full state ownership through part privatisation, to full stock market listing or private holding. Cross ownership of minority stakes in airlines is common. Examples have included Singapore Airlines owning a minority stake in Virgin Atlantic, British Airways through part of the study period holding a 25% stake in Australian carrier Qantas, Lufthansa holding a stake in US airline Jet Blue, and Cathay Pacific developing cross-shareholdings with Chinese flag carrier Air China. Several airlines in the study operated or launched fully or partly owned subsidiary airlines during the study period including Qantas-Jetstar; Singapore Airlines–Silk Air and Tiger; and KLM-Martinair. Revenue and operating costs for the subsidiaries are rarely reported separately, with results generally merged into the parent carrier’s group results. Results for several larger airlines including Lufthansa, British Airways, Air France, Qantas, Singapore Airlines, and Japan Airlines therefore include subsidiary airline activity.

Ownership values were added to the dataset indicating the percentage of an airline’s stock available to non-state investors. Any airline fully privatised, whether stock market listed or held by private investors, and without any residual government holding is shown as 100% non-state. An airline with any portion of its ownership in the hands of government, treasury investment agencies, sovereign wealth funds, or state controlled pension and provident funds has the proportion of that state holding recorded in the database. Fully privatised airlines such as British Airways or Lufthansa score a value of 100%, part privatised airlines such as Thai International show the percentage of stock
not directly held by state agencies. It is useful to note that the proportion of ‘free floating’ stock that is available to trade on stock exchanges may be smaller where partly privatised airlines have large blocks of stock placed with institutions.

Where an ownership change occurred, such as a stock market listing, a sell down of a state shareholding, or the taking of a strategic stake by another carrier, the ownership value recorded reflected the position at the year-end. Significant shifts in airline ownership are widely reported and were identified through the Dow-Jones Factiva and Reuters databases. Verification was often possible from the investor relations area of the carrier’s website. A number of privately held airlines are divisions of large tour operator businesses such as TUI and Thomas Cook. These airlines operated as charter carriers in the earlier years of the study, but with the advent of online distribution and competition from LCC market entrants most have adapted their business towards the LCC model by distributing online and selling ‘seat only’ tickets as well as inclusive packages. For the purposes of analysis, airlines forming part of a tour operating company were included with the LCC segment. Operating margins for these airlines are vulnerable to transfer pricing within the tour company, and are at risk of representing the profitability of tour packaging rather than pure airline operations in any year.
<table>
<thead>
<tr>
<th>Carrier Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Full-Service Network Carrier. Stock market listed - plc</td>
<td>Wide shareholding – may have some strategic stakes and in some cases a very small residual government ownership (NOT a golden share). May also be a fully or part owned full-service subsidiary of a large network carrier e.g. Swiss International is a subsidiary of Lufthansa.</td>
</tr>
<tr>
<td>Traditional Full-Service Network Carrier with Significant or Total State ownership</td>
<td>Airlines where governments directly or through state investment agencies and pension funds hold large stakes or golden shares and impact board appointments e.g. Thai Airways International.</td>
</tr>
<tr>
<td>Low Cost Carrier or Charter/Tour operator</td>
<td>An airline that operates a Low Cost Model, usually providing short haul flights without hub connectivity or an airline that operates as a subsidiary of a larger leisure or package tour group e.g. Ryanair.</td>
</tr>
<tr>
<td>LCC – network airline subsidiary</td>
<td>Subsidiary of a network carrier – either serving parallel markets or replacing the legacy carrier on low-yield markets. Performance data for these carriers was commonly merged with the reporting of the parent and these airlines could not be separated in the study e.g. Jetstar, a subsidiary of Qantas.</td>
</tr>
</tbody>
</table>

Table 6.4 Airline business model definitions

6.6.2 Geographic regions

Regions were defined in line with the IATA tariff regions of Europe, Mid-East/Africa, and Asia-Pacific. IATA Area 3 (the Asia-Pacific region) includes the South Asian sub-
continent, Northeast Asia, the 12 current ASEAN states, Australia/New Zealand, and the smaller Pacific states.

As discussed earlier, this study was limited to three regions, Europe, the Middle East and the Asia-Pacific region. The airline industry in sub-Saharan Africa remains small and fragmented, with few airlines operating long-haul networks and so it was excluded from the study. The North American market began its deregulation process in the 1970’s and without state owned airlines or low freedom economies in the region offers little scope for valid comparison.

6.6.3 Airline nationality

Airlines operate internationally using home-state traffic rights negotiated under the framework of the Chicago Convention (ICAC 1944). A state field was added to each airline data record in the database to identify the state in which the airline is based (the host country).

Towards the end of the study (from 2004) large scale cross-border mergers occurred in Europe, with Lufthansa taking control of Swiss International and Austrian Airlines, Air France merging with Dutch carrier KLM, and in 2011 British Airways agreeing to a merger with Spanish flag carrier and oneworld alliance partner Iberia. Despite the merged ownership structures, these airlines continued to operate as separate units, reporting separate revenue and cost data. Consequently, they remain as separate entities in the analysis.
6.6.4 The Institutional measure - Economic freedom index

Economic indicators including global economic (GDP) growth are quantified by agencies including the World Bank. Company financial performance and ownership data are periodically compiled and regularly reported by industry journals, financial institutions, and news services. Measures of state-level institutional behaviour are more complex (Fraser Institute 2010). Two widely used indexes of economic freedom are available. The Index of Economic Freedom is published by the conservative United States based Heritage Foundation. The Economic Freedom of the World report is published by the Canada based Fraser Institute.

The Heritage Foundation-Wall Street Journal Index identified in Chapter Four has been the subject of debate over methodology (Scott 1997, Holmes and Beach 1997).

The Fraser Institute index was adopted for this study as it is less politically aligned and offers a peer reviewed annual report containing the index. The purpose of the index is to ‘measures the degree to which the policies and institutions of countries are supportive of economic freedom’ (Fraser Institute 2010:2). The Fraser Institute identifies ‘cornerstones of economic freedom’ (Fraser Institute 2010:2) that are consistent with the institutional structures supportive of economic growth and development identified by North (1990). These include personal choice, voluntary exchange, freedom to compete, and security of privately owned property. Gwartney (2010) identifies the five broad areas measured by the Fraser Institute index as:
• Size of Government: Expenditures, Taxes, and Enterprises,
• Legal Structure and Security of Property Rights,
• Access to Sound Money,
• Freedom to Trade Internationally, and
• Regulation of Credit, Labour, and Business.

The index is designed to permit comparisons over time, with the average economic freedom score rising from 5.53 (out of 10) in 1980 to 6.74 in 2007. The score fell back to 6.67 during the economic downturn in 2008. This was the most recent year for which data are available, and contains the only global downturn for economic freedom recorded over the timeframe of this research.

In the 2008 Fraser Institute table, Hong Kong achieves the highest rating for economic freedom, scoring 9.05 out of 10. Singapore (8.70), New Zealand (8.27), Switzerland (8.08), Australia (7.90), and the United Kingdom (7.81) are countries included in this study that fall within the top ten places of the index. The rankings (and scores) of other large economies in the study are Germany 24 (7.46), Japan 24 (7.46), France 35 (7.32), Italy 66 (6.90), Russia 84 (6.62), China 82 (6.65), and India 87 (6.51).

6.6.5 Tests for carrier inclusion in the data

The raw data set included 205 carriers ranging from major flag carriers British Airways and Air France to unsuccessful new entrants such as Debonair and Maxjet. Of these,
131 airlines remain in the study. In the initial review these remaining carriers were tested against three (3) criteria for inclusion:

1. Total revenue of at least $US100 million in at least one year of operation. This revenue threshold represents modelling of a small commercial airline operation with a fleet of at least 4 narrow body jet aircraft (Airbus A320/Boeing B737) in commercial service achieving industry average load factors, daily utilisation, and yields.

2. At least three (3) consecutive years of commercial operation. This test removed carriers with brief and unsuccessful market entry attempts including Debonair, Paradise Air, Silverjet, Oasis Hong Kong, and Eos.

3. Rebranding or merger – these airlines were aggregated under a single identifier, usually a hybrid of the brands.  

Twenty-three (23) airlines were aggregated where rebranding or consolidation had taken place, a further twenty failed the minimum revenue and operations tests. The remaining airlines excluded (many of them were small carriers in Eastern Europe and Russia) had reported incomplete data, usually a single measure such as revenue or load factor.

The final dataset included 131 airlines and a breakdown according to geographic region is provided below:

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11 This problem is best demonstrated with the collapse and restructure of Swissair. In 2001, two carriers were based in Switzerland, the flag carrier Swissair and a smaller regional operator Crossair. At Swissair’s financial collapse, a rescue plan saw a significant portion of the company’s fleet and its operation at Zurich airport shifted into the much smaller Crossair. Crossair was then rebranded as Swiss International. Flights were re-numbered with Crossair’s airline identifier (LX) rather than the earlier Swissair identifier (SR). Tracking the industry in Switzerland therefore requires realignment of the ownership, operator, and identifier changes from 2001.
• Europe 78 airlines (23 LCC/Charter)
• Middle-East/Nth Africa 13 airlines (1 LCC)
• Asia-Pacific 40 airlines (6 LCC)

Further, airlines were identified by their business model. Carriers were split between the full service model typified by hub connectivity, multi-class service and diverse fleets, and the low cost (LCC model), typified by dense seat configurations, point to point schedules, and single type fleets (Doganis 2006). It is recognised that hybrids of this model are emerging and that a third business model (that Porter 1980 would warn was 'stuck in the middle') emerged.

6.7 Change of ownership as a catalyst for change in organisational performance

An intended outcome of this research is a contribution to policy development in the areas of airline privatisation and aviation deregulation. This issue is particularly relevant in Southeast Asia where a significant share of airline capacity is delivered by state owned carriers, and where the first steps towards regional liberalisation have been made (Bofinger and King 2008). While the research cannot predict the progress of ASEAN aviation policy, it offers an analysis of the likely impacts of privatisation and institutional quality on operating margins for airlines in the region.

In this research the occurrence of an ownership change is considered to be the catalyst for a change in organisational performance, measured by a change in operating margin.
One of the preliminary studies identified this change in operating margin for airlines that were privatised. This study extends that analysis to address the broader conditions of the industry, considering both the privatisation process and the impacts of institutional quality. That is, the analysis seeks to affirm that an improvement in the firm's financial performance is directly related not only to its change in ownership structure through privatisation, but to the institutional quality of its host country.

With the introduction of economic freedom as a latent variable (Vermunt and Magidson 2004) for institutional quality, the study also allows an estimation of the improvement in performance by state businesses when governments provide greater economic freedom. This research also allows estimation of the cost of regulatory constraints by allowing estimation of the change in performance that may be possible if airlines were freed from Chicago Convention (ICAC 1944) regulatory constraints, and were free to base their business in countries that offered superior institutional conditions.

The following chapter reports the results of the analysis conducted using the methodology outlined in this chapter. The impacts of GDP growth and fuel costs on the airline industry are studied, before the analysis of a series of hypotheses establishes the impacts of each of institutional quality (measured using the Economic Freedom of the World Index), and (state or non-state) ownership on airline operating margins. Further analysis examines the interrelationship between these factors and tests the consistency, under various scenarios, of the research model developed in this research.
Chapter Seven

Results

7.1. Introduction

The preliminary studies confirmed that institutional quality has an important influence on strategic effectiveness in the airline industry, and that it plays a stronger role than ownership in determining the operating margin of airlines. This chapter provides the results of analysis of the database of 131 airlines over nineteen years. Variation in strategic effectiveness is quantified in operating margin comparisons between regions, between market segments, between operating models, and under three GDP growth scenarios.

The initial research followed Backx et al (2002) with a focus on the impacts of privatisation and ownership on airline performance. Airlines without majority government holdings and airlines that had been privatised were found to achieve superior operating margins, but ownership was found to be insufficient as a measure to completely explain performance differences. The framework was extended to incorporate the significantly stronger factor of institutional quality that was identified in the third preliminary study.
The initial direction of this research placed the airline industry within Porter's (1980) generic strategy framework. The competitive landscape of the airline industry was mapped, and airline business model innovations were analysed within the generic strategy framework.

The key product innovation in the timeline of the study was the emergence of the low cost carrier model, commonly adopting a narrowly focused best cost strategy (Porter 1980) for market entry. The low cost model provides a market entry model that overcomes the weakness of a small capital base and the lack of the network linkages at market entry that the full service model requires. Entering regional rather than global markets further reduces the need for scale and capital.

The disruptive and contrarian behaviour observed in new entrant airlines (e.g. expansion during times of market downturn) required an extension of the theoretical approach to this research. This was found in Lengnick Hall and Wolff's (1999) strategy logics. The capability logic is adopted by firms defending and reshaping their existing capacities. The capability logic represents an extension of the resource based view (Barney 1991) and helps to explain the defensive path-dependent position taken by the legacy full service network carriers in the face of low cost carrier market entry. Conversely, the guerrilla logic (Lengnick Hall and Wolff 1999:1112) explains the disruptive behaviour of the new entrant competitors, with entry strategies designed to destroy the traditional market structures and unsettle incumbents. This analysis required the integration of theory. Integration finds support from Brown and Eisenhardt (1997) and Teece,
Pisano and Shuen (1997). The effectiveness of integration is demonstrated in this research, where improved explanatory ability emerges as several stands of strategy theory are brought to bear on a single problem.

Using this theoretical understanding, a contingency table-based framework was developed to analyse the results of this quantitative study and to investigate the relationships between airline ownership, institutional quality, and operating margin. Operating margin was adopted as the latent variable to measure the effectiveness of strategy development and implementation in each of the study regions (Asia Pacific, Europe, and the Middle East). Sensitivity studies extend the analysis to investigate the impacts of differing economic conditions and the entry of the Low Cost Carrier business model. These sensitivity studies allow the framework to be tested in the face of different parameter values, and help to assess what circumstances might lead to changes in airline strategy development.

The results derived show that the framework is consistent and robust in identifying the joint impacts of ownership and institutional on airline operating margin. Furthermore the framework's output is consistent under low, mid, and higher range GDP growth, as well as across geographic regions.

The third set of hypotheses that address the interrelatedness of ownership and institutional quality also measure the differing impacts of low cost carrier market entry in countries with higher or lower institutional quality. The findings from this third set of hypotheses are reported in Section 7.4.
This chapter contains four sections. Section 7.1 revisits the research question and the research structure. Section 7.2 quantifies current industry performance and re-introduces the 11% minimum operating margin target (developed in Section 6.2.3) and its relationship to airline invested capital costs and returns. The minimum operating margin reflects the combination of airlines’ asset turn ratios (identified as being between 0.4-0.7) and the airline industry’s weighted average cost of capital that was established in Section 6.2.2. Section 7.3 investigates the responsiveness of air travel demand to changes in GDP and identifies the role of fuel surcharges in airline revenue generation. Section 7.4 reports on the results of the hypothesis testing. Three series of hypotheses address parameters of ownership, institutional quality and the interactions between ownership and institutional quality.

Performance (measured by operating margin) fluctuates at an individual airline level. Multiple regression analysis undertaken as part of the author’s preliminary research discussed in Chapter Four, identified difficulties fitting a correlation model to the extended time series across a cohort of 131 airlines. This preliminary research analysis identified cross-tab analysis as an effective methodology for this research. Once the airlines in the preliminary study are identified by a series of categorical variables, and the data assembled into contingency tables, strong and consistent differences between these categories emerge.

The categories developed in the third preliminary study are applied in this research. This categorisation facilitates the use of cross-tab analysis by creating
two independent variable categories of ownership and institutional quality. The four airline clusters established are:

- High-Freedom State-Owned (HFSO) Representing majority State-Owned airlines hosted in countries with high institutional quality;
- High-Freedom Non-State (HFNS) Representing airlines with minority or no state investment and hosted in countries with high institutional quality;
- Low-Freedom State-Owned (LFSO) Representing majority State-Owned airlines hosted in countries with lower institutional quality; and
- Low-Freedom Non-State (LFNS) Representing airlines with minority or no state investment and hosted in countries with lower institutional quality.

The ability to drill down through these clusters is supported by the additional categorical variables of geographic region (Europe, Middle East, Asia-Pacific), business model (low cost versus full service), and economic conditions (low, mid, and high range global GDP growth). This further segmentation tests the consistency of the framework under varying conditions. It also and supports detailed analysis of the impact of the entry of the Low Cost Carrier business model midway through the study timeframe, a major strategic inflection point for the industry (Grove 1998).

### 7.2 Industry performance

This thesis addresses the poor long-term return on capital that exists in the airline industry. Data for a wide range of airlines, both state-owned and non-state, is
captured and analysed. Consolidating both revenue generation and cost control; operating margin is used to measure the impacts of both internal decision-making and exogenous institutional factors that impact the business over time.

7.2.1 Lost economic value quantified

The impact of a 4% shortfall on the aggregate performance of the industry can be quantified by estimating the capital employed. This is undertaken for the final year of the study (2008). Applying industry-average asset turn rates of 0.6 times, an asset base of $860 billion is estimated for 2008 from global airline revenues of $US560 billion (IATA 2010). A shortfall of return on capital of 4% on this $860 billion asset base represents lost economic value of $34.4 billion on the capital deployed by airline owners for 2008.

Fig 7.1 Airline industry shortfall in return on capital. Source: IATA
The IATA (2010) data illustrates the chronic shortfall of return on capital by airlines, with the industry failing to recover the cost of capital, even in 'good' years where global GDP growth is strong. When global economic growth slows, (e.g. during 2001 and 2008) airline return on capital deteriorates.

7.2.1 Sensitivity study: Minority government stakes in airlines.

Where more than half of an airline remains in the hands of government owners (including indirect state ownership though sovereign wealth funds or government owned investment agencies) the airline is categorised in this study as state-owned. Minority non-state stakes of up to 49% exist in state-owned carriers in the study, but government stakes of between 35-49% of an airline’s stock are rare. Analysis of the database identified only five instances of large state-owned minority stakes. These occurred only during transition periods of privatisation for KLM, Lufthansa, Air France, and Austrian Airlines, and also during the restructure of Swissair following its 2001 bankruptcy.

7.3 Growing air transport demand is not matched by improving returns

This section draws on industry data to establish that:

- Air transport demand responds to economic growth
- Revenue growth does not deliver real unit revenue gains, but is largely a consequence of fuel surcharge policies that are obscuring a steady long term decline in unit revenues (yields).
Data reported in Table 7.1 demonstrate that while the volume of passengers carried by airlines continues to grow, industry profitability remains poor, even in the face of constant cost cutting. This cost cutting can be identified from analysis demonstrating that non-fuel costs grow more slowly than passenger load.

Fuel price volatility increased in the later years of the study. Fuel prices have a significant impact on airline profitability, and are shown here to impact revenue growth. Between 2002 and 2008 oil prices quadrupled from $25 to $99 per barrel. A common airline response to fuel price rises is to impose a fuel surcharge on airfares. Fuel surcharges may not always recover the total impact of price increases, but are designed to contribute significantly to offsetting rising fuel costs. To model the impact of fuel surcharges on airline yields, an assumption of full fuel cost recovery is made. Total fuel costs are then subtracted from airline revenues to produce a ‘net’ revenue value exclusive of fuel surcharges. This net revenue is then analysed to separate revenue growth derived from increased demand (using load statistics reported in aircraft manufacturer Boeing’s market reports), and revenue derived from yield increases.

Consequently, the analysis removes fuel surcharges and market growth from reported total revenues to identify the residual change in unit revenues. In all but two years (2006 and 2008), the residual change is a decline in unit revenues.

The outcome of this combination of factors is continued capital investment for fleet and network expansion to manage load growth in an environment where unit revenues are falling steadily, and where the ability to make further inroads on costs is limited as the major cost items including fuel are outside the airlines’ control (IATA 2009).
Table 7.1 gives the airline industry revenue, load, and cost analysis. This table consolidates, revenue, fuel costs, load growth rates, and changes in unit costs and revenues from several industry sources for the period from 2002-2010. Source: ICAO, IATA, Boeing.

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>$US billions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>$306</td>
<td>$322</td>
<td>$379</td>
<td>$413</td>
<td>$465</td>
<td>$510</td>
<td>$564</td>
<td>$482</td>
</tr>
<tr>
<td>Expenses</td>
<td>$311</td>
<td>$323</td>
<td>$376</td>
<td>$409</td>
<td>$450</td>
<td>$490</td>
<td>$573</td>
<td>$483</td>
</tr>
<tr>
<td>Fuel cost</td>
<td>$40</td>
<td>$44</td>
<td>$65</td>
<td>$91</td>
<td>$107</td>
<td>$134</td>
<td>$189</td>
<td>$113</td>
</tr>
<tr>
<td>Revenue less</td>
<td>$266</td>
<td>$278</td>
<td>$314</td>
<td>$322</td>
<td>$358</td>
<td>$376</td>
<td>$375</td>
<td>$369</td>
</tr>
<tr>
<td>fuel cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonfuel costs</td>
<td>$271</td>
<td>$279</td>
<td>$311</td>
<td>$318</td>
<td>$343</td>
<td>$356</td>
<td>$384</td>
<td>$370</td>
</tr>
<tr>
<td>Op Profit $bn</td>
<td>-$5</td>
<td>-$1</td>
<td>$3</td>
<td>$4</td>
<td>$15</td>
<td>$20</td>
<td>-$9</td>
<td>-$1</td>
</tr>
</tbody>
</table>

% change in

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>2.7</td>
<td>2.8</td>
<td>4.2</td>
<td>4.3</td>
<td>4.0</td>
<td>3.8</td>
<td>1.7</td>
<td>(2.2)</td>
</tr>
<tr>
<td>Revenue</td>
<td>5.2</td>
<td>17.7</td>
<td>9.0</td>
<td>12.6</td>
<td>9.7</td>
<td>10.6</td>
<td>(14.5)</td>
<td></td>
</tr>
<tr>
<td>Unit revenue</td>
<td>-2.1</td>
<td>-4.9</td>
<td>2.8</td>
<td>(3.4)</td>
<td>6.3</td>
<td>(5.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load (RPK)</td>
<td>13.6</td>
<td>7.2</td>
<td>5.1</td>
<td>7.2</td>
<td>1.6</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rev less fuel</td>
<td>3.0</td>
<td>11.5</td>
<td>2.3</td>
<td>7.9</td>
<td>3.8</td>
<td>7.9</td>
<td>(3.6)</td>
<td></td>
</tr>
<tr>
<td>Fuel cost</td>
<td>10.0</td>
<td>47.7</td>
<td>40.0</td>
<td>17.6</td>
<td>25.2</td>
<td>41.0</td>
<td>(40.2)</td>
<td></td>
</tr>
<tr>
<td>Nonfuel costs</td>
<td>3.0</td>
<td>11.5</td>
<td>2.3</td>
<td>7.9</td>
<td>3.8</td>
<td>7.9</td>
<td>(3.6)</td>
<td></td>
</tr>
<tr>
<td>Brent crude</td>
<td>$25</td>
<td>$29</td>
<td>$38</td>
<td>$54</td>
<td>$65</td>
<td>$73</td>
<td>$99</td>
<td>$62</td>
</tr>
</tbody>
</table>

USD/barrel

7.3.1 Air travel demand responds to changes in GDP

As discussed previously, the relationship between GDP growth and airline traffic demand is well documented (Tarry 2004, Morrell 2007, Pearce 2008, Holloway 2008), and is one of the a priori foundations for this study. Holloway (2008) identifies the responsiveness of demand, estimating an income elasticity of demand for air traffic at between 1.2 and 2.5 times income growth, depending on
the availability of substitutes (such as rail for shorthaul flying) and the purpose of travel. An interesting result from the fuel surcharge modelling reported in Table 7.1 is that traffic growth did not appear to be significantly depressed by the imposition of fuel charges, even as fuel prices doubled between 2005 and 2008.

Holloway (2008) notes the failure of the industry to deliver real unit revenue growth, with inflation adjusted revenues achieving poorer than unitary elasticity. That is, real unit revenues are falling while capacity growth matches demand growth (Holloway 2008). Periods of increased demand in an industry with a limited ability to respond quickly with additional capacity (supply) should arguably lead to upward pressure on unit revenues (yields) and potentially an improvement in profitability (Holloway 2008). The reality for airlines has been a 'profitless prosperity' where the revenue growth has lagged behind traffic growth, and as fuel prices have risen, much of the revenue increase for airlines has come as a result of fuel surcharges on airfares that are then passed through to fuel suppliers.

The volatile results underline the vulnerability of airline margins to fuel price, where fuel represents up to 33% of the industry's total operating costs, and where fuel prices can rise rapidly. A paradox emerges: airlines that have consistently failed to set long-run pricing and capacity at levels that would deliver an adequate return on capital are apparently able to respond swiftly with fuel surcharges to counter rapid fuel price escalation.
This initial analysis of industry-level data identifies both a failure to meet adequate returns on invested capital, and the vulnerability of airlines to changing economic conditions and fuel costs. One positive impact of these external factors is the tendency for fuel prices to recede as economic growth eases.

7.4 Testing the hypotheses

In order to test each hypothesis, the analysis begins by aggregating revenue and cost data for the airlines in all three geographic regions. By applying the categorical variables to create sort fields in 'Microsoft Excel' pivot tables, the data can then be examined at more detailed levels. As noted in Chapter Six, pivot tables in Excel spreadsheets enable the rapid sorting and summing of data, and the assembly of contingency tables. The categorical sort fields available for pivot table analysis in this study include calendar year, GDP growth, ownership, economic freedom, and business model. An example of pivot table analysis from this research is included as Appendix 3.

Airline cost and revenue data are used to calculate operating margin in each table. The categorical sort fields form the parameters for analysis, and are applied to the data and to populate the ownership and economic freedom (institutional quality) fields of the theoretical framework. Parameter selection allows a series of 'drill-downs' within the dataset to be explored, including airline operating model and the analysis of the data by time period. As noted earlier, time period is captured in two ways in the database. Calendar year allows separation of data prior to and
following the arrival of the low cost carrier business model, while clusters of years categorised by the GDP growth variable allow periods of low, moderate or higher GDP growth to be contrasted. Institutional quality is measured with the Economic Freedom of the World (EFW) Index. Appendix 1 summarises the pivot tables created.

7.4.1 Ownership hypotheses

The ownership hypotheses are:

Ownership Hypothesis 1 (OH 1) That airlines in full or significant State-ownership will achieve poorer operating margins than those airlines that are privately held or have a majority of their stock listed on the stock exchange;

Ownership Hypothesis 2 (OH 2) That a difference in operating margin will be related to the proportion of shares traded freely; and

Ownership Hypothesis 3 (OH 3) That the gap in performance between state-owned and private carriers will be greater in years of economic downturn when the total industry performs poorly.

Ownership Hypothesis 1

Ownership Hypothesis 1 contrasts the operating margins achieved by airlines outside state-ownership with airlines in full or majority state-ownership or control. The hypothesised relationship is that state-owned airlines will achieve poorer operating margins than those airlines that are privately held or have a majority of their stock listed on the stock exchange.
Neither the state-owned nor non-state state airlines meet the benchmark operating margin of 11% previously established in Chapter Six. Ownership hypothesis 1 is strongly supported by this analysis, which finds that the non-state-owned airlines in the study achieved an operating margin of 3.6%, more than double that achieved by the state-owned airlines (Table 7.2). The annual operating margin results for state and non-state airlines are attached as Appendix 4b.

Table 7.2 Illustrates the Operating margin by Ownership structure.

<table>
<thead>
<tr>
<th>Operating Margin ~ Period</th>
<th>1990-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>region</td>
<td>State</td>
</tr>
<tr>
<td>(All)</td>
<td>1.4%</td>
</tr>
<tr>
<td>revenue share</td>
<td>34%</td>
</tr>
</tbody>
</table>

This finding is consistent with the literature, including Backx et al 2002, identifying superior margins for privatised and non-state airlines. While superior to the state airline result, the 3.6% operating margin for the non-state airlines illustrates the Cournot-Nash equilibrium problem facing airlines (Keen and Standish 2006) where fragmentation of the industry leaves individual airlines too small to exercise control over changes of capacity. The fragmented industry structure leaves only weak market power, and limits the prospect of airlines successfully managing capacity to pursue a profit maximising objective (Borenstein Bushnell and Knittel 1997:4). The problem is exacerbated by the short run stickiness of supply for
airlines, where seasonal schedules and hub connectivity require stability of operations, even in the face of variable demand.

7.4.1.1 Declining state ownership stabilised in 1994

The share of revenue generated by state-owned airlines fell steeply between 1990 and 1994 as privatisations were undertaken in Europe and the Asia-Pacific regions. From 1995 the proportion of revenue generated by state-owned airlines settled at close to one third of total revenues. Overall, state-owned airlines generated 34% of the revenue throughout the nineteen years of the study. The continuing privatisation of airlines in Europe and the arrival of non-state low cost carriers in Europe and the Asia-Pacific region (including India) is offset by the re-nationalisation of airlines (e.g. Air New Zealand) after the terror attack disruptions of 2001, and the steady growth of state-owned airlines in Southeast Asia, China, and the Middle East.

In Europe, the shift away from state-ownership is particularly pronounced. Revenue from non-state airlines grows fourfold over the study while the revenue for state-owned airlines is little changed. This occurred in an environment where the European Union placed strict limits on subsidies to state enterprises (European Union 1999), and indicated that institutional structures in the airline industry can be modified positively. This ownership trend is illustrated in Figure 7.1.
Europe's internal deregulation provides a model for a restructured global airline industry. Limits on state subsidy, regionally (rather than bilaterally) negotiated traffic rights, and cross-border ownership could extend Europe's rationalisation to other regional blocs.

Fig 7.2 Europe: Revenue contribution by airline ownership model

7.4.1.2 Results by region

State-owned airlines in Europe achieve the weakest operating margin result in the region. The carriers in this cluster (including chronic loss makers Olympic Airlines of Greece and Italy's Alitalia that were restructured and privatised towards the end of the research timeframe), deliver an operating margin of merely 0.7%, representing bare coverage of operating costs. The scale of Alitalia and Olympic Airways, and their extended period of restructuring exerted a significant downward pressure on this market segment. State ownership of airlines creates the major strategic risk of the commercial focus being overwhelmed by
institutional factors, where governments provide levels of state aid that distort markets. Morrell (2007:3) notes that subsidies approved by the European Union for the restructuring of five state-owned carriers between the years of 1992-1997 totalled $US8.94 billion, almost 17% of those airlines' revenues for the previous three years. Two of the five airlines (TAP and Olympic) were still state-owned and loss making in 2007 (Morrell 2007).

Table 7.3 Operating Margin and Revenue Share: by Ownership structure and Region

<table>
<thead>
<tr>
<th>Operating Margin - Year</th>
<th>1990-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State</td>
</tr>
<tr>
<td>EUROPE</td>
<td>0.7%</td>
</tr>
<tr>
<td>rev share</td>
<td>33%</td>
</tr>
<tr>
<td>MID EAST</td>
<td>1.4%</td>
</tr>
<tr>
<td>rev share</td>
<td>95%</td>
</tr>
<tr>
<td>ASIA/PACIFIC</td>
<td>3.5%</td>
</tr>
<tr>
<td>rev share</td>
<td>30%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.4%</td>
</tr>
<tr>
<td>rev share</td>
<td>34%</td>
</tr>
</tbody>
</table>

Little difference is evident between operating margins under state or non-state ownership in the Asia-Pacific region. Singapore Airlines contributes to the strong performance of state-owned carriers in the Asia-Pacific cluster, but with its equity-heavy capital structure and modest asset turn, Singapore Airlines requires a
minimum operating margin in excess of 17% to meet its Weighted Average Cost of Capital. This requirement should result in a higher operating margin for the state-owned airline category in the Asia-Pacific region than would be the case with the more common capital structure of between 50%-65% debt.

Regionally, the results for the Middle East cluster are the weakest of the study. The region is dominated by state-owned airlines that deliver an operating margin of 1.4% with an effective return on capital close to 1%. The Middle East carriers grew rapidly in the later years of the study, with the continued expansion by Emirates and the market entry of Etihad. Qatar Airways also entered the market in this period, but is excluded from the study as revenue and cost data are not publicly available.

Privatisation of national flag carriers is largely complete in the major economies of Europe, but has not progressed in Southeast Asia. In the analysis conducted for hypothesis one, state ownership is found to depress airline operating margins in Europe and the Middle East. Analysis of ownership in the Asia pacific region produces a neutral result.

Ownership hypothesis 2.

Ownership Hypothesis 2 proposes that any poorer operating margin performance by state-owned carriers will be directly related to the proportion of shares traded in that airline. If the airline has a large (but minority) non-state shareholding, the airline will achieve a higher operating margin than an airline in full state ownership.
Very little non-state ownership was found in the Middle East region over the life of the study. Comparisons for that region are therefore excluded from the analysis conducted for Ownership Hypothesis 2 (OH2).

To test for the strength of, or indeed existence of, a relationship between the proportion of state ownership and operating margin, the Pearson Product Moment coefficient of correlation (Hair et al. 1998:143) referred to earlier in this study is calculated for the total state carrier segment, and for the state carrier segment in both the Asia-Pacific and Europe regions. Pearson's Product Moment coefficient of correlation 'r' is based on a method of covariance and measures the correlation between two separate cases. In testing this hypothesis, the Pearson correlation is applied to test for a relationship between the proportion of an airline's shares in state-ownership and the operating margin of that airline. The hypothesis predicts a poorer operating margin flowing from a higher level of state ownership. A significant negative correlation would indicate that this is indeed the case.

Usage of the Pearson coefficient of correlation requires four assumptions around the dataset to be met. These are:

- Independence of case: cases should be independent to each other.
- Distribution: variables of the correlation should be normally distributed.
- Cause and effect relationship: there should be a cause and effect relationship between the correlation variables.
- Linear relationship: two variables should be linearly related to each other.
The probable error of the Pearson coefficient can be calculated using the formula

\[ P.E. = 0.6745 \frac{1 - r^2}{\sqrt{N}} \]

Where P.E. is the Probable Error, \( r \) is the absolute value of the Pearson coefficient, and \( N \) is the number of observations (Eels 1929). When \( r \) is less than 6 times the Probable Error, then the findings are not significant.

Table 7.4 Shows the Pearson correlation: State shareholding and operating margin for airline groups 1990-2008

<table>
<thead>
<tr>
<th></th>
<th>Europe</th>
<th>Asia-Pacific</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson correlation coefficient ( r )</td>
<td>0.1127</td>
<td>0.1899</td>
<td>0.1393</td>
</tr>
<tr>
<td>P.E. x 6</td>
<td>0.2353</td>
<td>0.2187</td>
<td>0.1606</td>
</tr>
</tbody>
</table>

No statistically significant relationship was found between the proportion of state ownership and operating margin in any region. Hypothesis OH2 is not supported.

The low correlation coefficients found for both the European and Asia-Pacific regions indicate that there is no relationship between the level of state shareholding and an airline's operating margin. This finding suggests that once the state has effective control of an airline, the presence of minority shareholders has no significant impact on an airline's operating margin, and consequently has very little impact on its strategy development and implementation. These airlines are more likely to act as fully state-owned enterprises than to exhibit the strategic focus or discipline of non-state firms.
Ownership Hypothesis 3

Ownership Hypothesis 3 compares the responsiveness of state and non-state airlines to changing economic conditions. The hypothesis proposes that the results for state-owned airlines will exhibit greater volatility. When the market slumps or when it grows above the long run trend, state-owned airlines are expected to respond less effectively, while non-state carriers are likely to be more nimble and responsive, leading to stronger and less volatile results. Three economic scenarios were developed in order to test this hypothesis.

The economic scenarios adopted for this research are:

Scenario 1 (Base Case): Representing moderate GDP growth rates of 2.00-3.88%.

Scenario 1 applies in ten years of moderate economic growth in the study, and represents GDP growth within 1 standard deviation of the mean 2.9% global GDP growth over the nineteen years of this research. Applying the established demand multiple (Tarry 2004), GDP growth of 2.9% translates into air transport demand growth of between 4.5%-5.0%.

Scenario 2: (Lower Growth Case): Representing GDP growth rates below 2%.

GDP growth for this scenario is modelled at 1.6%. This represents air transport demand growth of approximately 2.5%. Airline fleet plans have limited flexibility, and reduced demand growth is often addressed with discount pricing rather than capacity
moderation. Offsetting declines in revenues are savings on major operating costs, in particular reduced fuel costs. Analysis in table 7.2 identifies a reduction in the fuel price as economic growth fades, moderating the impact of an overall demand reduction. Lesser demand for higher yielding business travel and declining volumes of freight shipment are significant for full service network carriers. The exposure of Northeast Asian airlines to declining freight demand is examined in Section 7.4.1.4.

Scenario 3: (Higher Growth Case): Representing GDP growth rates above 3.88%.

GDP growth for this scenario is modelled at 4.3%. Under this scenario, air transport demand would grow above 6.5%. The likely impacts are higher load factors on aircraft and increased yields from greater business traffic. Load and yield improvement should contribute to an improved operating margin, but cost pressures generated from higher fuel costs (identified in Table 7.1) as well as increased airport congestion and delay costs moderate gains. Capacity constraints may limit opportunities for growth at major hub airports.

Hypothesis OH 3 is concerned not with this raw increase in demand, but with the change to operating margin that is achieved by airlines when demand shifts up or down. A greater volatility in operating margin performance for state-owned carriers would indicate a constrained ability to respond to changing economic conditions.

Hypothesis OH3 was tested in two stages. In Table 7.5 the operating margin for each of the three economic scenarios was summarised by region and by ownership category.
Volatility analysis was then conducted by measuring the coefficient of variation for the reported outputs. In this analysis, volatility serves as a proxy measure for adaptability, and a smaller coefficient of variation represents a greater capacity within an airline category to adjust to the changing economic environment.

Table 7.5 Operating margin responses to GDP growth – by region and ownership

<table>
<thead>
<tr>
<th>Region</th>
<th>Ownership</th>
<th>GDP Scenario 2 &lt;2%</th>
<th>GDP Base case Scenario 1 2-3.87%</th>
<th>GDP Scenario 3 3.88% +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>State</td>
<td>0.85</td>
<td>0.79</td>
<td>1.63</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>1.36</td>
<td>4.31</td>
<td>4.85</td>
</tr>
<tr>
<td></td>
<td>Variance</td>
<td>0.51</td>
<td>3.52</td>
<td>3.22</td>
</tr>
<tr>
<td>Asia-Pac</td>
<td>State</td>
<td>0.40</td>
<td>6.56</td>
<td>3.99</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>1.09</td>
<td>2.77</td>
<td>4.71</td>
</tr>
<tr>
<td></td>
<td>Variance</td>
<td>0.69</td>
<td>-3.79</td>
<td>0.72</td>
</tr>
<tr>
<td>Mid East</td>
<td>State</td>
<td>0.82</td>
<td>0.89</td>
<td>2.98</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>limited data</td>
<td>****</td>
<td>****</td>
</tr>
<tr>
<td>TOTAL</td>
<td>State</td>
<td>0.32</td>
<td>2.56</td>
<td>2.79</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>1.24</td>
<td>3.54</td>
<td>4.78</td>
</tr>
<tr>
<td></td>
<td>Variance</td>
<td>0.92</td>
<td>0.98</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Consolidating the three regions, the coefficient of variation for state-owned carriers is 0.72 and for non-state carriers is 0.56. This represents markedly greater adaptability for the non-state airlines, and supports Hypothesis OH3. Volatility measures by region are reported in Table 7.8. The state-owned carriers’ higher volatility and poorer results found in times of stronger economic growth support Ownership Hypothesis OH 3.
Table 7.6. Illustrates the measures of adaptability to changing economic conditions and the Coefficient of variation by Region and Ownership.

<table>
<thead>
<tr>
<th>Region</th>
<th>Ownership</th>
<th>Coefficient of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>State</td>
<td>0.430</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>0.536</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>State</td>
<td>0.848</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>0.634</td>
</tr>
<tr>
<td>Mid East</td>
<td>State</td>
<td>0.785</td>
</tr>
<tr>
<td></td>
<td>Non-state</td>
<td>***</td>
</tr>
</tbody>
</table>

7.4.1.3 The coefficient of variation as a measure of volatility

Volatility is a reality of the airline industry (Holloway 2008), with exogenous forces including fuel price, pandemics, terror attacks, and natural disasters impacting on demand. Analysis using a coefficient of variation allows measurement of the capacity of an airline (or category of airlines in this research) to respond to change. A more effective response to change should result in a lower coefficient of variation.

The coefficient of variation shows the ratio of the standard deviation to the mean, and can be applied to compare the degree of variation or volatility from one data series to another (Black 2009).

\[ CV = \frac{\sigma}{\mu} \]
The coefficient of variation can be used even where the means are significantly different from each other, or where data sets are comprised of different units. This makes the measure useful in assessing the relative risk of companies (Black 2009:67).

7.4.1.4 Sensitivity study: Northeast Asian airlines’ exposure to cargo volatility

Business models and airline structures vary between regions. One significant difference is that the Asia-Pacific carriers, particularly those based in Northeast Asia, generate a greater proportion of their total revenues from freight operations than airlines in either Europe or North America. Freight revenues decline during economic downturns with an income elasticity estimated to be close to 2.0 (Boeing 2006, 2009). Several airlines in the study have significant cargo revenues, with Korean, China Airlines, Eva, Asiana, and Cathay Pacific being the five largest integrated passenger/cargo carriers in Asia (Boeing 2009). For these airlines, cargo contributes in excess of 30% of revenues against 15% for Lufthansa and Air France and less than 10% for British Airways in Europe (Boeing 2009). Unlike passenger traffic, offering low yielding volume replacement pricing does not stimulate cargo demand. When industrial markets weaken, air freight volumes diminish. The greater reliance on cargo revenues exposes FSNC in Asia to greater volatility in periods of economic downturn. This volatility is tested by calculating coefficients of variation for the Asian and European markets.

The results reported in table 7.7 were limited to non-state airlines. As there is little state ownership of the largest freight carriers in either Europe or the Asia-Pacific
region; the comparison of the coefficient of variation for operating margins was conducted only on the results of the non-state-owned carriers in both these regions. A higher coefficient of variation represents higher volatility in the results of airlines within a region. Results show a significantly greater volatility in the operating margin for the airlines in the Asia-Pacific region (71.5%) than for the equivalent carriers in Europe (50.4%). The lesser exposure to volatile freight markets in Europe where freight revenues constitute a significantly smaller proportion of total airline revenue reduces overall volatility in airline results.

Table 7.7 Illustrates the Coefficients of Variation for Asia-Pacific and European non-state airline operating margins between 1990-2008

<table>
<thead>
<tr>
<th></th>
<th>Asia-Pacific Non-State</th>
<th>Europe Non-State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean operating margin</td>
<td>3.12</td>
<td>3.55</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.0223</td>
<td>0.0179</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>0.715</td>
<td>0.504</td>
</tr>
</tbody>
</table>

The results of the long run analysis of ownership are consistent with the earlier research addressed in Chapter Four which identified the performance difference between ownership groups. Privatisation has accompanied deregulation in both the Asia Pacific region and in Europe. Finding superior performance for non-state airlines in some market segments supports a case for further privatisation of airlines in those segments.
7.4.1.5 LCC impact on FSNC margins in Europe

FSNC are constrained in their ability to respond to changing economic conditions. The operation of hub and spoke networks that generate connecting traffic from a wide range of nodes through a central hub (or hubs) require stable of operations that limit the airline's ability to enter or withdraw from markets, and even to reduce flying at times of economic downturn. LCC have greater flexibility to enter or leave city pair markets as conditions change, and therefore should achieve superior operating margins during periods of economic downturn. When GDP growth is strong, capacity constraints and strengthening business travel and freight markets allow FSNC to deliver superior operating margins.

7.4.1.6 Low cost carriers will adopt 'guerrilla strategy' during downturns to capture counter-cyclical market share growth

Low cost entrants have demonstrated counter-cyclical behaviour, growing during times of economic downturn. Air Asia captured domestic market share in Malaysia and launched international operations from Malaysia to Thailand as Malaysia Airlines reduced operations during the 2003 SARS crisis (Douglas 2005). Ryanair responded to the post September 11, 2001 downturn by expanding its fleet with aircraft purchased at steep discounts (Lawton 2003, Douglas 2005). The business travel and freight markets that decline during periods of downturn represent core revenues for FSNCs but are of less importance to the LCC sector.

While LCC operating cost advantages allow price sensitive demand to be switched from FSNC when markets soften, the FSNC have a limited ability to adjust their networks to the lower levels of demand. For FSNC, price competition with LCC
airlines to retain passenger loads places further downward pressures operating margin. The expected outcome of these conditions is a greater deterioration of FSNC margins at times of economic downturn, but a greater opportunity for FSNC to extract higher margins during times of stronger economic growth. The economic scenarios applied to test Ownership Hypothesis 3 were applied again to contrast the FSNC and LCC carriers under the three economic environments.

Low cost airlines arrived more recently in the Asia-Pacific region. The limited data available from LCC airlines (most in a market entry phase during the study timeframe) would limit the validity of analysis. Furthermore, operating results for Jetstar, Jetstar-Asia, Advance, and Tiger Airways were consolidated within their parent group results. With little data for independent analysis of the Asia-Pacific region the analysis was limited to European LCC data. These results are presented in Table 7.8.

Table 7.8 Operating margins for FSNC and LCC under low, moderate and high growth economic scenarios

<table>
<thead>
<tr>
<th></th>
<th>Higher GDP</th>
<th>Midrange GDP</th>
<th>Lower GDP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUROPE</td>
<td>FSNC</td>
<td>3.4%</td>
<td>3.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>LCC</td>
<td>6.0%</td>
<td>6.5%</td>
<td>4.6%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>FSNC</td>
<td>3.9%</td>
<td>3.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td>LCC</td>
<td>6.0%</td>
<td>6.7%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Analysis of the European region shows that both LCC and FSNC operating margins respond to changes in GDP growth. The LCC segment appears less able to capture improved results from strong economic growth. This suggests that fuel price rises
(identified in Table 7.1) and the low cost model's smaller penetration of premium business markets has limited its performance. LCC revenues are optimised in periods of moderate economic growth. The results for FSNC, however, continue to strengthen as economic growth accelerates. The full service carrier product caters more directly to higher yielding business travel, and revenue from this premium segment grows when economic growth is strong. The improvement in operating margin is tempered by increasing fuel costs and the disruptions to network services experienced at more congested major hubs airports.

Both FSNC and LCC carriers experience deterioration in operating margins when economic growth slips below 2%. The deterioration of FSNC margins is greater, leaving a gap for the LCC airlines to drive FSNC to margins towards breakeven point using 'guerilla strategies' (Lengnick Hall and Wolff 1999) to create market disruption and capture market share gains.

![GDP impact by business model 1990 - 2008. All Regions.](image)

Fig 7.3 Illustrates that higher GDP growth favours the full service airlines
Full service carriers operate networks that require frequency to sustain customer loyalty and to maintain operating efficiencies. There is limited flexibility for FSNC to use smaller aircraft or cancel flights during periods of economic downturn. When flights are cancelled the aircraft planned for the operation are rarely able to be redeployed to generate alternative revenue streams. Reduced fleet requirements can be addressed either by reducing the daily hours operated by all fleet units or by parking unused aircraft in storage, or by bringing forward the retirement of ageing aircraft. In some cases upcoming aircraft orders can be deferred. In times of downturn, reduced traffic demand concurrently reduces asset utilisation (turn) and places downward pressure on unit revenues, because airlines discount to sustain traffic volumes on network-based services that cannot be easily withdrawn.

7.4.1.7 Internet-selling creates a strategic inflection point

The airline industry passed a major inflection point (Grove 1998) in 2000-2001 when online selling established a lower cost distribution method and enabled the growth of LCCs. To assess the impact of this emerging business model, revenue share and operating margin are further segmented by time period for each of the four study segments for the periods between 1990-1999 and 2000-2008.
Table 7.9 Illustrates the operating margin by airline category and by time period

<table>
<thead>
<tr>
<th></th>
<th>Operating Margin 1990-99</th>
<th>Operating Margin 2000-08</th>
<th>Revenue Share 1990-99</th>
<th>Revenue Share 2000-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>High freedom - non State</td>
<td>5.5%</td>
<td>4.5%</td>
<td>35%</td>
<td>34%</td>
</tr>
<tr>
<td>High freedom -State</td>
<td>3.3%</td>
<td>4.1%</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Low freedom - non State</td>
<td>1.9%</td>
<td>2.2%</td>
<td>27%</td>
<td>34%</td>
</tr>
<tr>
<td>Low freedom -State</td>
<td>1.8%</td>
<td>0.8%</td>
<td>29%</td>
<td>24%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3.2%</strong></td>
<td><strong>2.8%</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7.9 shows that the overall operating margin declined in the post-2000 period by 12.5%. Two significant changes are evident. In the HFNS segment operating margins declined by 18%. The HFNS segment was most impacted by the emergence of the LCC business model. Low cost carriers represented 20% of the total operating revenue for that HFNS segment between 2000 and 2008. In total, 84% of the LCC revenue in the study was generated by new entrants competing directly with airlines in the HFNS market segment over the period 2000-2008.

The impacts of the new LCC competition are reported in Table 7.10. The 30% fall in margin for non-state full service airlines hosted in the higher freedom economies is contrasted with the 16% rise in operating margin for non-state airlines in the lower freedom economies. LCC market entry is significantly less evident in the lower freedom economies. The market entry of low cost carriers in lower freedom economies has been marked by negative operating margins. The
LCC segment in the lower economic freedom markets is small, and in the early stages of development.

Table 7.10 Displays the Full Service and LCC operating margins by category

<table>
<thead>
<tr>
<th></th>
<th>FSNC Operating Margin</th>
<th>LCC Operating Margin</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFNS segment</td>
<td>3.8</td>
<td>7.7</td>
<td>4.5</td>
</tr>
<tr>
<td>HFSO segment</td>
<td>4.1</td>
<td>NA</td>
<td>4.1</td>
</tr>
<tr>
<td>LFNS segment</td>
<td>2.3</td>
<td>-4.1</td>
<td>2.2</td>
</tr>
<tr>
<td>LFSO segment</td>
<td>0.8</td>
<td>-1.3</td>
<td>0.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2.5</td>
<td>6.3</td>
<td>2.8</td>
</tr>
</tbody>
</table>

7.4.1.8 Middle East FSNC maintain growth through periods of downturn

Contrary to the observed strategy for FSNC in Europe and the Asia Pacific region, airlines based in the Middle East continued to mount substantial capacity growth during the 2008-09 financial crisis. Capacity between the Middle East and the Asia-Pacific region grew 12.4% and between the Middle East and Europe capacity grew by 10.4%. During the same period capacity between Europe and the Asia-Pacific region fell 4.9%, trans-Atlantic capacity fell 9.0% and North Pacific capacity fell by 7.7% (Dunn 2010). While most FSNC were reducing capacity to match rapidly falling demand and yields, Middle Eastern state-owned carriers continued to mount capacity at rates double those projected even for periods of strong GDP growth. This suggests that meeting (even breakeven) operating margin was set
aside in favour of capturing market share gains, a strategy more commonly adopted by low cost airlines.

7.4.1.9 Industry directions and strategies vary between regions

There is no obvious common or global strategy for the airline industry. Different factor conditions, different market structures, and the presence of substitute products (e.g. high speed rail) make uniform or global strategies unlikely. In each region differences in competitive behaviour, ease of market entry/exit, privatisation, infrastructure development, regulation, alliances, economic development shape, and increasing environmental policies influence strategic decisions by airlines. Growth remains a common target for the industry as airlines seek scale efficiencies and market reach to drive their financial returns (Hitt Ireland and Hoskisson 2005).

A summary of current competitive challenges facing the airline industry in each geographic region of the study is presented in Table 7.11. This table identifies major issues driving strategy development. It is evident that Europe is leading the process of deregulation by pressing for the relaxation of rules limiting ownership and market access, constraining state aid, liberalising internal markets, and giving deregulation the force of law. Other regions are moving more slowly. The ASEAN countries have mapped a more delayed pathway to liberalised aviation markets, but are dependent on a consensus decision-making process, and still even today have many national flag carriers under state-ownership.
Australia and New Zealand have opened their domestic markets to foreign owned competitors, but remain bound by inflexible bilateral negotiations to secure international traffic rights. Reliance on bilateral negotiations can lead to assymetrical outcomes. An example is the difference in market access granted to airlines of the United Arab Emirates by the Australian and Canadian governments. While Canada has limited bilateral access for the United Arab Emirates to seven weekly flights to be shared between the two airlines Emirates and Etihad, both carriers exercise traffic rights for multiple daily flights into Australia. The greater market access provided to Australia not only impacts Australian carriers, but also the major 6th freedom participants in Asia including Singapore Airlines whose hubs can be bypassed.

The large domestic markets of India and Indonesia have seen rapid growth of their LCC operations, while growth in China and Hong Kong has been driven by FSNC. The remainder of Northeast Asia has made little progress towards regional consolidation.

7.4.2 Institutional Quality (Economic freedom) hypotheses

The Institutional Quality hypotheses are listed below:

- Institutional Quality Hypothesis 1 (EH1) That airlines in countries with a higher economic freedom index score will achieve better operating margins,
- Institutional Quality Hypothesis 2 (EH 2) That state ownership in countries with high levels of freedom is not an impediment to achieving adequate return on capital, and
• Institutional Quality Hypothesis 3 (EH 3) That private ownership in countries with lower levels of economic freedom cannot overcome the impact of a poorer institutional environment.

Institutional Quality Hypothesis 1 (EH1)

The Institutional Quality Hypothesis EH 1 proposes that airlines hosted in countries with a higher index of economic freedom will achieve better operating margins. The results of the testing of this hypothesis are shown in Table 7.11.

Table 7.11 Operating margin reported by region and economic freedom index category

<table>
<thead>
<tr>
<th>Economic Freedom</th>
<th>Europe</th>
<th>Asia-Pacific</th>
<th>Middle East</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher</td>
<td>3.9%</td>
<td>6.9%</td>
<td>-0.6%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Lower</td>
<td>1.4%</td>
<td>1.8%</td>
<td>2.3%</td>
<td>1.6%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2.8%</td>
<td>3.3%</td>
<td>1.4%</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

Hypothesis EH1 is strongly supported both at a total level and in each of the two major regions. Airlines in the higher freedom economies fall short of the 11% benchmark operating margin required to fully recover the cost of capital, but airlines in higher freedom economies in the Asia-Pacific region delivered the highest long-run returns (6.9%) of the study.

The consistency of the performance gap between countries with higher and lower indices of economic freedom is illustrated in Figure 7.4.
Figure 7.4 Illustrating the consistent difference in operating margin between
carriers in countries with higher or lower institutional quality

The Pearson product moment correlation between the index of economic freedom and
the operating margin is calculated for the dataset. After testing for probable error, a
statistically significant low level correlation (0.149) is found at the total study level, and
a moderate (0.243) correlation is found for Europe. That is, a moderately strong positive
relationship is found to exist between the level of economic freedom of a (European)
country and the operating margin performance of an airline based in that country.
Institutional Quality Hypothesis 2 (EH2)

Institutional Quality Hypothesis EH 2 proposes that state-ownership in countries with high levels of freedom is not an impediment to adequate financial outcomes, measured by operating margin. This hypothesis is supported and the findings are reported in Table 7.14.

Recognising that the entire industry falls short of the minimum operating margin, Institutional Quality Hypothesis EH 2 was tested to identify the relative performance of state and non-state airlines in the high freedom economies. Underlying the hypothesis is the expectation that governments in high freedom economies will exert less institutional influence on both state-owned and non-carriers. The institutional pressures include explicit actions such as direction over route networks, and implicit factors including uncertainty over property rights and political stability. The expectation in the hypothesis is that better institutional conditions should produce similar operating margin performance for both state and non-state airlines.

Table 7.12. Illustrates the Operating margins for airlines based in countries with higher Institutional Quality – by Region.

<table>
<thead>
<tr>
<th>High Freedom</th>
<th>Europe</th>
<th>Asia-Pacific</th>
<th>Middle East</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-state</td>
<td>4.3%</td>
<td>6.8%</td>
<td>14.4%</td>
<td>4.9%</td>
</tr>
<tr>
<td>State</td>
<td>0.1%</td>
<td>7.0%</td>
<td>-1.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.8%</td>
<td>6.9%</td>
<td>-0.6%</td>
<td>4.7%</td>
</tr>
</tbody>
</table>
The results identify substantial regional differences. Three airlines in higher freedom economies in Asia remain in state ownership. These are Air New Zealand that was renationalised after bankruptcy in 2001, China Airlines of Taiwan that is 54% held by the state investment agency but freed from direct political oversight and Singapore Airlines with a majority shareholding from state investment vehicle Temasek. These three state-owned airlines deliver operating margin performance that matches their non-state peers in the region's higher freedom countries. This suggests that in the Asia-Pacific region, state ownership is no impediment to achieving operating margins that match non-state airlines.

Significantly different results emerge in Europe, where the small numbers of state carriers in free economies (predominantly Finnair and Aer Lingus) barely break even at an operating margin level. The Middle East has very limited data and because of this no conclusions are drawn.

The inclusion of Aer Lingus in the European results brings a carrier undergoing a major restructure of its business model. That restructure brings costs and revenue penalties driven by market changes as. Aer Lingus shifts from operating as a full service network carrier towards running a low cost model. This change takes place while Aer Lingus defends itself from takeover offers from major LCC Ryanair at its home base. To achieve this transition Aer Lingus must shed much of its legacy network structure and refocus its business model towards the LCC point to point model. Results in the preliminary study (Douglas 2009) which were discussed in Chapter 4 show the progress made towards unit cost and unit revenue changes by Aer Lingus.
7.4.3 Hypotheses integrating ownership and institutional quality

The analysis to this point has established that airlines in state-ownership generate lower operating margins, have more volatile performance when faced with changing economic conditions, and are less able than the non-state carriers to capture margin improvements during periods of economic upturn. Even for the small number of state-owned flag carriers based in countries with higher institutional quality, only a small cohort of airlines based in the Asia-Pacific region is able to match the performance of the non-state airlines.

As discussed, airlines based in countries with higher institutional quality, (tested using an economic freedom index as a latent variable), are shown to deliver stronger operating margins than their peers in countries with poorer institutional quality (Table 7.12), and a statistically significant correlation is identified between the economic freedom index of the host country and operating margin for airlines in Europe.

Interaction between the ownership and institutional variables is foreshadowed in the research framework, and is examined through the third set of hypotheses. They are recapped here and are the:

- Interrelation Hypothesis 1 (IH 1): That state-ownership in excess of 50% when combined with lower levels of institutional quality (economic freedom) in the host country limits an airline’s operating margin to a point close to breakeven only, and
• Interrelation Hypothesis (IH 2): That a poorer operating margin will be achieved even in years of robust economic growth, and where the industry is experiencing strong demand growth.

The results of testing for the Interrelation hypotheses can be positioned in the framework developed by Douglas (2010b) and outlined in Chapter 4. This framework combines the categorical variables of ownership and institutional quality (addressed in the hypotheses already presented in this chapter) to investigate the combined impact of ownership and institutional quality on the effectiveness of strategy implementation.

Non-state airlines based in countries with higher institutional quality are defined as the base case for comparison with the operating margin results of the remaining segments. The structure of the framework and the expected impacts of the two categorical variables are outlined in Fig 7.5.
Fig 7.5 Framework consolidating the cross-tab analysis of airline operating margin.

<table>
<thead>
<tr>
<th></th>
<th>State ownership or control through state investment vehicles &gt;50%</th>
<th>50% + of shares listed or held by private owners</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Freedom Index values &gt;0.75th percentile</strong></td>
<td><strong>Hands Off -1</strong></td>
<td><strong>Base Case.</strong></td>
</tr>
<tr>
<td></td>
<td>State-Ownership impact – negative</td>
<td>Non-state Ownership impact – positive</td>
</tr>
<tr>
<td></td>
<td>Institutional Quality impact - positive</td>
<td>Institutional Quality impact - positive</td>
</tr>
<tr>
<td><strong>Lower Freedom Index values &lt;0.75th percentile</strong></td>
<td><strong>Meddlers. -3</strong></td>
<td><strong>Avoiders. -2</strong></td>
</tr>
<tr>
<td></td>
<td>State-Ownership impact – negative</td>
<td>Non-state Ownership impact – positive</td>
</tr>
<tr>
<td></td>
<td>Institutional Quality impact - negative</td>
<td>Institutional Quality impact - negative</td>
</tr>
</tbody>
</table>

7.4.3.1 Ownership and economic freedom interaction. Introduction of the theoretical framework

At the study level, these results confirm hypothesis IH1, with the operating margin for the LFSO segment reaching only 0.5%. The significance of this result is that over 25% of the commercial airline business across the study regions has generated a return on invested capital close to zero over 19 years which is very close to the lifespan of a commercial aircraft. These airlines have effectively consumed the value of the aircraft by operating them close to breakeven on their operating costs, but making no financial return that would fund their replacement.
Table 7.13 provides analysis of the interaction between ownership and institutional factors, and presents the theoretical framework developed for this study. Analysing the industry categorical data in this contingency table juxtaposes the key variables.

Table 7.13 Study-level analysis of ownership and institutional quality

<table>
<thead>
<tr>
<th></th>
<th>All Regions</th>
<th>1990-2008</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Freedom</td>
<td></td>
<td></td>
<td>3.8%</td>
<td>4.9%</td>
<td>4.7%</td>
</tr>
<tr>
<td>rev share</td>
<td></td>
<td></td>
<td>8%</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Low Freedom</td>
<td></td>
<td></td>
<td>0.5%</td>
<td>2.4%</td>
<td>1.7%</td>
</tr>
<tr>
<td>rev share</td>
<td></td>
<td></td>
<td>26%</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1.4%</td>
<td>3.6%</td>
<td>2.9%</td>
<td></td>
</tr>
</tbody>
</table>

These results are extended by region in the following tables.

7.4.3.2 European Airlines

Hypothesis IH1 is confirmed for the European region. Europe’s total operating margin is (at 2.8%) close to the average for the entire study. Lower institutional quality translates, as predicted, into poorer operating margin performance in Europe, with airlines in this segment achieving operating margins 64% below those airlines hosted in the higher freedom economies. State-owned airlines in European countries with poorer institutional quality deliver the poorest results, generating operating margins below 1%, and barely covering the airlines’ operating costs.
Table 7.14 shows the analysis of ownership and institutional quality for Europe.

<table>
<thead>
<tr>
<th></th>
<th>1990-2008</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Freedom</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td>0.1%</td>
<td>5%</td>
<td>4.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td><strong>Low Freedom</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td>0.8%</td>
<td>28%</td>
<td>2.6%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0.7%</td>
<td>3.8%</td>
<td></td>
<td>2.8%</td>
</tr>
</tbody>
</table>

Airlines based in Europe are concentrated into two segments where operating margin varies widely. The HFNS carriers represent 50% of the market and LFSO carriers 28%. These segments deliver the highest and lowest operating margins in the region respectively, with the LFSO carriers barely achieving a breakeven on operations (0.8%). Conversely, LFNS airlines in Europe achieve better operating margins than the LFNS carriers in other regions. The negative impact of lower institutional quality is evident in Europe, but at a lower intensity than is observed in the Asia-Pacific region.

Europe’s small HFSO segment delivers a bare breakeven result. This results from the segment being composed predominantly of airlines in transition to privatisation, including German airline Lufthansa whose privatisation era revenues represent 50% of the segment.

European results are consistent with the treatment of the earlier studies. European Union constraints on state aid should drive reform of this lowest yielding segment,
as the airlines generating inadequate margins to re-equip their fleets as aircraft are retired will no longer have access to state aid. European privatisation of airlines in the higher freedom economies was commenced prior to the study period.

7.4.3.3 Asia-Pacific

Results for the regional analysis for the Asia-Pacific region are reported in Table 7.15. Hypothesis H1 is supported, but the Asia-Pacific results show significantly less impact from state-ownership than is the case in Europe.

Whereas 55% of the revenue in Europe was generated by airlines based in countries with higher institutional quality, the proportion is only 29% for the Asia-Pacific region. Despite the greater contribution from lower freedom Asia-Pacific economies the overall operating margin for the Asia-Pacific region 3.3%. This is 14% above the full study result of 2.9% and results from the strong operating margins achieved by Asia-Pacific airlines based in higher freedom states.

Table 7.15 An analysis of ownership and institutional quality for Asia-Pacific

<table>
<thead>
<tr>
<th></th>
<th>ASIA/PACIFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-2008</td>
<td>State</td>
</tr>
<tr>
<td>High Freedom</td>
<td>7.0%</td>
</tr>
<tr>
<td>rev share</td>
<td>11%</td>
</tr>
<tr>
<td>Low Freedom</td>
<td>1.5%</td>
</tr>
<tr>
<td>rev share</td>
<td>19%</td>
</tr>
<tr>
<td>Total</td>
<td>3.5%</td>
</tr>
</tbody>
</table>
Adjusting for Singapore Airlines' higher MOM would bring the HFSO quadrant below the profit maximising base case. Air Asia, with its very low unit costs and low asset turnover, also has a high MOM requirement to reach its cost of capital. Air Asia however makes up less than 1% of the revenue for this segment of the study, and has no impact on the framework findings.

The Low Freedom State-owned (LFSO) quadrant of the framework produces the lowest operating margin for the study. In both Europe and the Asia-Pacific regions, state ownership in poorer institutional quality (lower freedom) economies produces a poorer outcome than that achieved by non-state airlines. Compared to the Asia-Pacific region the variation is stronger in Europe, where the LFSO operating margin underperforms the higher institutional quality/non-state (HFNS) base case by 82%. By comparison, the LFNS segment underperforms the base case by 40%.

The results indicate that institutional impacts are more widely felt in the Asia-Pacific region. The operating margin of the state-owned airlines in lower freedom economies is 78% lower than the HFNS base case. The lower freedom non-state (LFNS) segment achieves only a slightly stronger results that the state-owned carriers; with a 72% decline against the HFNS base case.

Less than 1% the Middle East market is made up of HFNS carriers and the very small segment includes a new market entrant. The limited data combines with short timeframe for operations in this segment render comparisons against the
HFNS segment unreliable. The Middle East carriers’ results are incorporated into the total analysis.

Summary of findings for hypothesis IH1.

The findings of the analysis support Hypothesis IH1, that the combination of state-ownership with a host country that has poor institutional quality (LFSO) reduces airline operating margins towards a breakeven result, leaving little or no contribution towards the cost of capital employed in the business.

The LFSO segment characterised by an operating margin barely 1% above its breakeven cost contains airlines generating 25% of the operating revenue measured in the study regions. To measure the economic cost of this low operating margin, an asset base of $100 billion for the segment was estimated by applying an asset turn rate of 0.6 to the average annual revenue generated by the LFSO segment for the period between 2006-2008.

The remaining 75% of the revenue that is generated by the other industry segments is generating an average return on capital close to 5%, leaving the LFSO with an estimated shortfall, even against the industry average rather than the benchmark return on capital, of approximately $4 billion annually.

Hypothesis IH2

The final hypothesis tested in the study is Interrelation Hypothesis 2. This hypothesis addresses the sensitivity of the model to the economic scenarios first considered in Ownership Hypothesis 2. The Interrelation Hypothesis 2 proposes that the airlines in the LFSO segment will not capture an operating margin
advantage from strong economic conditions. The operating margin results for all market segments under the strong growth scenario are reported in Table 7.18 with the comparisons of the economic growth scenarios reported in Table 7.19.

7.4.3.4 Strong Economic growth

The sensitivity of operating margin to economic growth was tested by region and ownership model in Ownership Hypothesis 3. The results are reported in Table 7.5. Expanding the analysis to include institutional quality (economic freedom) reaffirms the consistency of the model developed in this research.

Table 7.16 Illustrating the operating margin results by segment under higher GDP growth conditions

<table>
<thead>
<tr>
<th></th>
<th>GDP &gt;3.5%</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Freedom</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5%</td>
<td>5.9%</td>
<td>5.9%</td>
<td>5.9%</td>
<td></td>
</tr>
<tr>
<td>8%</td>
<td>34%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low Freedom</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9%</td>
<td>3.6%</td>
<td>3.6%</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>24%</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2.8%</td>
<td>4.8%</td>
<td>4.2%</td>
<td></td>
</tr>
</tbody>
</table>

Further testing, both at a regional level and at a business model level, is reported in the following section.
Table 7.17 shows a summary of the operating margins for higher and low institutional quality under three economic scenarios. The results are separated for state-owned and non-state airlines.

<table>
<thead>
<tr>
<th>BASE CASE</th>
<th>State-owned</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher Institutional Quality</td>
<td>HFSO 3.8%</td>
<td>HFNS 4.9%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Higher GDP Scenario</td>
<td>5.5%</td>
<td>5.9%</td>
<td>5.9%</td>
</tr>
<tr>
<td></td>
<td>+1.7 points</td>
<td>+1.0 point</td>
<td>+ 1.2 points</td>
</tr>
<tr>
<td>Lower GDP Scenario</td>
<td>1.4%</td>
<td>2.5%</td>
<td>2.2%</td>
</tr>
<tr>
<td></td>
<td>-4.1 points</td>
<td>-2.4 points</td>
<td>-3.7 points</td>
</tr>
<tr>
<td>BASE CASE</td>
<td>LFSO 1.2%</td>
<td>LFNS 2.1%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Lower Institutional Quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Freedom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher GDP</td>
<td>1.9%</td>
<td>3.6%</td>
<td>2.9%</td>
</tr>
<tr>
<td></td>
<td>+0.7 points</td>
<td>+1.5 points</td>
<td>+1.2 points</td>
</tr>
<tr>
<td>Lower GDP</td>
<td>-1.0%</td>
<td>0.1%</td>
<td>-0.4%</td>
</tr>
<tr>
<td></td>
<td>-2.2 points</td>
<td>-2.2 points</td>
<td>-2.2 points</td>
</tr>
</tbody>
</table>

The only segment reported to achieve a negative operating margin result at the summarised study level is the LFSO segment. Under the low GDP scenario, all segments suffer a decline in operating margin. The HFSO segment declines most steeply (-4.1 percentage points). The three remaining categories decline by 2.2
percentage points each. This decline takes the LFSO segment to a result below breakeven (-1.0% operating margin) under the low GDP growth scenario.

Under the higher growth economic scenario the LFSO segment achieves the weakest margin increase, and generates less than one third of the margin achieved by carriers based in the higher institutional quality states.

Regional analysis: High growth - Europe

The regional level results are explored to investigate the consistency of the framework between regions under the high GDP growth scenario. Results reported in Table 7.20 demonstrate a strong consistency in the framework between the market segments and across geographic regions.

Table 7.18 illustrating the results for Europe under the higher GDP growth scenario

<table>
<thead>
<tr>
<th></th>
<th>GDP &gt;3.5%</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Freedom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td>3.6%</td>
<td>2%</td>
<td>5.3%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Low Freedom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td>1.4%</td>
<td>25%</td>
<td>3.9%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Total</td>
<td>1.6%</td>
<td></td>
<td>4.9%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

The European region has the most established low cost carrier segment, and the impact of LCC market entry on the traditional full service (FSNC) carriers can be
tested using the European data in the study. This analysis (in Table 7.19) finds little impact from LCC entrants on the FSNC at times of high GDP growth. This finding is consistent with the expected result, where LCC impacts are felt at times of downturn where guerrilla strategy behaviours erode FSNC margins rather than at times of strong growth where FSNC enjoy robust demand for premium services and for freight.

Table 7.19 illustrating the operating margin by market segment for European full service network carriers under the high GDP growth scenario

<table>
<thead>
<tr>
<th>GDP &gt;3.5%</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Freedom</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[rev share]</td>
<td>3.6%</td>
<td>4.8%</td>
<td>4.7%</td>
</tr>
<tr>
<td>[rev share]</td>
<td>3%</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td><strong>Low Freedom</strong></td>
<td>[rev share]</td>
<td>1.4%</td>
<td>4.0%</td>
</tr>
<tr>
<td>[rev share]</td>
<td>27%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.6%</td>
<td>4.5%</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

Regional analysis: High growth – Asia-Pacific

Under the high GDP growth scenario, the Asia-Pacific airlines are found to come closest to meeting the benchmark operating margin. As noted earlier, these airlines are more exposed to airfreight demand, and enjoy stronger freight revenues as well as stronger premium passenger demand during periods of strong GDP growth. Results reported in Table 7.20 demonstrate strong consistency with the research framework, and underline the absence of an impact from ownership for airlines based in the countries with higher institutional quality. Overall, Asia-
Pacific operating margin is stronger than that reported for Europe, with greater strength found in the higher freedom segments.

Table 7.20 illustrating the results for Asia-Pacific under the higher GDP growth scenario

<table>
<thead>
<tr>
<th></th>
<th>Asia-Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP &gt;3.5%</td>
<td>State</td>
</tr>
<tr>
<td>High Freedom</td>
<td>8.0%</td>
</tr>
<tr>
<td>rev share</td>
<td>11%</td>
</tr>
<tr>
<td>Low Freedom</td>
<td>1.6%</td>
</tr>
<tr>
<td>rev share</td>
<td>19%</td>
</tr>
<tr>
<td>Total</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

Limited data is available for the LCC segment in the Asia-Pacific region over the study timeframe. Low cost carrier Air Asia entered the market in 2003 but its early results represent less than 1% of the regional market. Results for Jetstar are consolidated within the Qantas group. Given the limited data, a split by business model is not examined for the Asia-Pacific region.

Regional analysis: High growth – Middle East

The Middle East region analysis is found in Table 7.21. As 95% of the Middle East revenue in the study is generated by state-owned airlines, there is limited comparison available between segments.
Table 7.21 illustrating the results for the Middle East under the higher GDP growth scenario

<table>
<thead>
<tr>
<th></th>
<th>GDP &gt;3.5%</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Freedom</td>
<td>0.3%</td>
<td>14.8%</td>
<td>1%</td>
<td>0.5%</td>
</tr>
<tr>
<td>rev share</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Freedom</td>
<td>5.0%</td>
<td>0.7%</td>
<td>4%</td>
<td>4.7%</td>
</tr>
<tr>
<td>rev share</td>
<td>55%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.0%</td>
<td>2.6%</td>
<td></td>
<td>3.0%</td>
</tr>
</tbody>
</table>

7.4.3.5. Lower GDP growth

Table 7.22 shows the results for the framework under the low GDP growth scenario. As predicted both by the literature in Chapter 2 and in the earlier analysis, the operating margin declines for all segments. Airlines in the lower freedom economies deliver negative margins even at an operating cost level, with the non-state carriers at breakeven and the non-state carriers falling 1% below breakeven. The consistency of results within the framework remains strong, with the non-state airlines in higher freedom economies continuing to generate the strongest margins. This occurs despite the level of LCC competition in this segment which is predicted to intensify as guerrilla strategies are deployed during times of lower GDP growth.
Table 7.22 Illustrating the operating margin results by segment under lower GDP growth conditions

<table>
<thead>
<tr>
<th></th>
<th>All Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP &lt;2.0%</td>
<td></td>
</tr>
<tr>
<td><strong>High Freedom</strong></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>1.4%</td>
</tr>
<tr>
<td>non-State</td>
<td>2.5%</td>
</tr>
<tr>
<td>Total</td>
<td>2.2%</td>
</tr>
<tr>
<td>rev share</td>
<td>11%</td>
</tr>
<tr>
<td>non-State</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Low Freedom</strong></td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>-1.0%</td>
</tr>
<tr>
<td>non-State</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total</td>
<td>-0.4%</td>
</tr>
<tr>
<td>rev share</td>
<td>26%</td>
</tr>
<tr>
<td>non-State</td>
<td>32%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>-0.3%</td>
</tr>
<tr>
<td>non-State</td>
<td>1.3%</td>
</tr>
<tr>
<td>Total</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

To further explore the responsiveness of the various market segments to changing conditions the analysis is again expanded to apply the research framework at a regional level under the lower GDP growth scenario.

Regional analysis: Low growth – Europe

Findings for the low GDP growth scenario in Europe again demonstrate the consistency of the framework. The margin reported for the small HFSO segment (representing only 7% of revenue) is lower than predicted, but the segment includes airlines under reorganisation including Swissair in the aftermath of its bankruptcy filing in 2001. The collapse of Swissair resulted in a state sponsored restructure that saw the disposal Swissair's stakes in foreign carriers (including the closure of Belgian flag carrier Sabena), and the Swiss core of the airline re-
established within its former regional subsidiary Crossair. Costs included the rationalisation of the Swissair fleet, and the write down of failed investments.

Table 7.23 Illustrating the operating margin results for Europe under lower GDP growth conditions

<table>
<thead>
<tr>
<th>GDP &lt;2.0%</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Freedom</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>rev share</em></td>
<td>-1.1%</td>
<td>1.8%</td>
<td>1.4%</td>
</tr>
<tr>
<td></td>
<td>7%</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td><strong>Low Freedom</strong></td>
<td>-0.8%</td>
<td>0.2%</td>
<td>-0.4%</td>
</tr>
<tr>
<td><em>rev share</em></td>
<td>27%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-0.8%</td>
<td>1.4%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

Analysis of the European FSNC carriers is presented in Table 7.24, and again provides consistent results within the framework. The impact of more aggressive guerrilla strategies by the LCC airlines is evident in the fall in operating margins, particularly in the HFNS segment where the European LCC carriers are concentrated.
Table 7.24 illustrating the operating margin by market segment for European full-service network carriers under the lower GDP growth scenario

<table>
<thead>
<tr>
<th>Europe FSNC</th>
<th>GDP &lt;2.0%</th>
<th>State</th>
<th>non-State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Freedom</td>
<td>-1.1%</td>
<td>0.9%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td>8%</td>
<td>43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Freedom</td>
<td>-0.6%</td>
<td>0.3%</td>
<td>-0.3%</td>
<td></td>
</tr>
<tr>
<td>rev share</td>
<td>30%</td>
<td>19%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-0.7%</td>
<td>0.7%</td>
<td>0.2%</td>
<td></td>
</tr>
</tbody>
</table>

Regional analysis: Low growth – Asia-Pacific

Findings from testing the framework's consistency under lower GDP growth in the Asia-Pacific region are presented in Table 7.27. The framework again demonstrates consistency under this growth scenario. Of interest is the relatively strong margins maintained by the airlines in higher freedom economies during weaker economic conditions. The LCC segment was established later in the Asia-Pacific region than in Europe, and represented a significantly smaller proportion of the study revenue
Table 7.25 illustrating the operating margin for Asia-Pacific carriers under the lower GDP growth scenario

<table>
<thead>
<tr>
<th></th>
<th>Asia-Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State</td>
</tr>
<tr>
<td><strong>GDP &lt;2.0%</strong></td>
<td></td>
</tr>
<tr>
<td>High Freedom</td>
<td>4.3%</td>
</tr>
<tr>
<td>rev share</td>
<td>13%</td>
</tr>
<tr>
<td>Low Freedom</td>
<td>-1.9%</td>
</tr>
<tr>
<td>rev share</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Results for the Middle East region are again heavily skewed towards state-owned airlines, limiting the scope of analysis for this region.

Table 7.26 illustrating the operating margin for the Middle East carriers under the lower GDP growth scenario

<table>
<thead>
<tr>
<th></th>
<th>Mid East</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State</td>
</tr>
<tr>
<td><strong>GDP &lt;2.0%</strong></td>
<td></td>
</tr>
<tr>
<td>High Freedom</td>
<td>-3.4%</td>
</tr>
<tr>
<td>rev share</td>
<td>36%</td>
</tr>
<tr>
<td>Low Freedom</td>
<td>0.8%</td>
</tr>
<tr>
<td>rev share</td>
<td>57%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-0.8%</td>
</tr>
</tbody>
</table>
7.5 Summary of the chapter

The consistency of the findings within the research framework underline the effectiveness of cross-tab analysis in generating a clear explanation of the impacts of state-ownership and institutional quality. The impacts of ownership and of institutions on the strategic effectiveness of airlines are strongly evident. State ownership is demonstrated to impact negatively on airline operating margins across the study regions. Considered in isolation, institutional quality is also demonstrated to impact negatively on airline operating margins. In Europe a statistically significant relationship (a correlation co-efficient of 0.243 for Europe, discussed in the analysis of Hypothesis EH1) between the level of economic freedom in a country and the operating margin of airlines based in that country is found.

When institutional quality and state-ownership are combined, the operating margins of airlines are found to deteriorate towards breakeven. This analysis demonstrates not only that the low-freedom state-owned segment (representing 25% of the study population) makes no significant contribution towards the cost of capital invested in the airlines, but also that this segment is less able to adjust to periods of economic downturn, leading to negative operating margins in those years.

The results are drawn together in the following chapter, along with the implications of the findings and opportunities for further research.
Chapter Eight
Implications and Contribution
Conclusion

8.1 Introduction

In the fifty years since the first commercial jet aircraft opened a niche travel market the airline industry has grown to generate over $500 billion in revenues annually. The achievements in growth and market reach have not been matched by returns on capital for the airlines’ owners. This research was undertaken to study and explain these consistently weak returns. The author’s preliminary studies (Douglas 2005, 2007, 2009, 2010a, 2010b) identified two key drivers of the variability of operating margin between airlines. These were the ownership structure of airlines and the institutional environment in which they operate. From this preliminary analysis, specific questions emerged around four themes. These were:

- State ownership of airlines
  - Does operating margin vary between airlines that are in full as opposed to majority (>51%) state ownership?
  - Where state ownership is between 51-100%, is the size of the non-state share correlated the airline’s operating margin?
  - Will continued privatisation of airlines improve the financial performance of the industry?
• Institutional environment
  o Does the economic freedom of a country impact both state-owned and
    non-state carriers based there similarly?

• Business model innovation
  o Has the emergence of airlines operating the low cost (LCC) business
    model impacted upon the margins of full service network carriers?
  o Does any impact on the full service carriers vary between geographic
    regions?
  o Does the low cost model achieve better returns on capital than their full
    service competitors?

• Integration
  o Does any combination of ownership and institutional variables improve
    or worsen the operating margins airlines?

The findings in the research were unambiguous. Airlines free of state ownership and
based in countries with positive institutional environments generated stronger operating
margins. The stronger operating margins were found whether GDP growth was strong
or weak. Analysis in the preliminary studies also identified improvements in operating
margin made by airlines following privatisation. Over the nineteen years studied in this
research, airlines based in Europe, the Middle East and the Asia-Pacific region
generated $US2.9 trillion in revenues. On those revenues the airlines produced an
aggregate, operating margin of just 2.9%, far short of the level needed to make an
adequate return on the capital invested in the industry. One quarter of the revenue
analysed in the study (almost $US 750 billion) was generated by airlines that achieved
an operating margin within 1% of the breakeven cost of their operations. Those airlines
shared two key features. Each was majority owned by a government, and each was based in a country with poor institutional quality.

Analysis to combine the factors of ownership and institutions found that the institutional environment (measured by economic freedom) had a greater impact than ownership. These findings are explained in detail in Section 8.2, but the key finding was that the combination of state-ownership and a poor institutional environment drives airline operating margins down close to breakeven. For these airlines in the weakest segment to reach the operating margins required to meet their cost of capital, revenues would need to increase or costs (in aggregate) to decrease by almost $9 billion annually.

These weakest airlines not only fail to deliver a return on capital to their owners, but by sustaining capacity that is not generating returns, they drive down the margins of the remainder of the industry. Changes to the aviation regulatory environment that could address this issue are proposed later in this chapter.

Privatisation and deregulation have been studied extensively in the airline context. Recent aviation studies have considered the emergence of the low cost carrier business model and the impacts of Internet distribution. Theoretical and empirical studies have given relatively little weight to the impact that the institutional environment has on airline strategy setting. Airlines are tied to their home countries by the regulatory structures that require a majority local shareholding to access a country's international traffic rights. This places significant institutional
barriers in front of an airline aiming to maximise its profitability and recover a return on capital.

The airline industry is unusual. By its very nature, it operates across national borders yet the companies that make up the industry are required by a regulatory framework crafted in the last months of World War 2 to stay based and owned within nation states. Ownership requirements to access bilateral traffic rights between countries (and more recently, regions) enforce fragmentation long after other global industries including motor vehicles, consumer electronics, petroleum products, fast moving consumer goods, and convenience foods have moved to global brands. The industries supporting aviation including aircraft manufacture, reservations systems and airframe maintenance have consolidated globally. All extract better margins in the value chain than the airlines they serve.

Airlines must accept, rather than choose, their institutional environment. An airline facing an unsupportive environment cannot relocate, sell, or merge. Relocation or ownership change would result in the loss of the traffic rights necessary for market access. Barriers to cross-border consolidation leave both fragmented ownership (with its attendant downward pressure on pricing) and complex hub-based operating networks where airlines funnel passengers to connect at home country airports in the absence of traffic rights for direct services (e.g. flying westward from Zurich to London to catch a flight travelling eastward from London to a final destination in Asia).

Regulations that required every television or soft drink to be made only by a company at least 51% owned by nationals of the country of sale, or traded
internationally exclusively under bilateral treaties on a country by country basis with manufacturers that were similarly rule bound would seem absurd. Yet the international airline business operates under these very prescribed conditions that both limit the opportunities for the more effective businesses and provide a continuing environment for the less effective ones. Airlines that are based in difficult institutional environments are unable either to move their business to a better environment or to merge with another company over national borders.

This chapter consolidates the research findings, addresses the consistency of the findings with the strategy and institutional theory presented in Chapters Two and Three, and considers the potential application of these findings to aviation policy development and management practice.

8.2. Main findings from the research framework

The framework in which the results of this research were analysed extended the work of earlier airline studies (Oum 1998, Backx et al 2002, Oesterle and Macharzina 2002, Borenstein and Rose 2007). This literature centred on privatisation and deregulation, and provided the context for this thesis. To capture the interactions between ownership factors and institutional quality the literature review was extended to include institutional theory (Coase 1991, North 1995, Oliver 1991,1997). This thesis extends the discussion by integrating these streams of research. Preliminary studies that were undertaken to develop this research and that are discussed in Chapter Four brought together industry-specific issues,
including market access, mergers, state ownership and privatisation with the broader issues of national economic freedom.

Table 8.1 below outlines the impacts of ownership and institutions on operating margin. It details the deterioration in margin delivered under state versus non-state ownership in the more free economies (a fall of 22.4%), the fall experienced where non-state owned companies operate in poorer institutional environments (a fall of 49%). Finally the impact of both factors is found to deliver a margin decline of 89.9%. This framework is used to analyse the regional results in the succeeding tables.

Table 8.1 outlines the scale of impacts from ownership and institutional factors. The cross-tab analysis compares the profit maximising HFNS airlines with airlines under state ownership, in poorer institutional environments, or both (the LFSO case).

<table>
<thead>
<tr>
<th>REGION:</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STATE OWNED</td>
</tr>
<tr>
<td>SMALLER INSTITUTIONAL IMPACT (free)</td>
<td>-22.4%</td>
</tr>
<tr>
<td></td>
<td>-1.1 margin points</td>
</tr>
<tr>
<td>GREATER INSTITUTIONAL IMPACT (less-free)</td>
<td>-89.8%</td>
</tr>
<tr>
<td></td>
<td>-4.2 margin points</td>
</tr>
</tbody>
</table>

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Causes of poor profitability for the airline industry were foreshadowed by the literature addressed in Chapters Two and Three. Cournot-Nash equilibrium theory (Keen 2004, Keen and Standish 2006) predicts that highly fragmented industries will struggle to control production capacity and that price competition will see marginal revenues sink towards marginal cost. Porter’s (2008) return to the ‘five-forces’ model reiterated aviation’s status as a ‘no-star’ industry with low entry barriers, powerful suppliers, easy customer switching and price-based rivalry (as predicted by Cournot-Nash theory). The findings of this research affirm this theoretical understanding that fragmented industries will struggle to control capacity, and that profitability will suffer as a consequence.

Where capacity cannot be controlled companies compete on price. The airline industry sells a perishable and relatively generic product. Capacity is inflexible in the short run, and the marginal cost of carrying an extra passenger is small. It is unsurprising that pricing rivalry drives marginal revenues well below average costs. Without consolidation and rationalisation the control of supply will remain elusive.
Table 8.2 describes the findings by category of airlines and quantifies the shortfall in operating margin generated by each category. The shortfall of 7.8% represents the difference between the operating margin identified in the study and the benchmark 11% operating margin required to deliver a satisfactory return on capital.

<table>
<thead>
<tr>
<th></th>
<th>Revenue Share %</th>
<th>Revenue $ billion</th>
<th>Margin Shortfall %</th>
<th>Impact $ billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFNS</td>
<td>34%</td>
<td>$102</td>
<td>2.2</td>
<td>-$6.6</td>
</tr>
<tr>
<td>HFSO</td>
<td>8%</td>
<td>$ 24</td>
<td>0.5</td>
<td>-$1.5</td>
</tr>
<tr>
<td>LFNS</td>
<td>32%</td>
<td>$ 96</td>
<td>2.5</td>
<td>-$7.5</td>
</tr>
<tr>
<td>LFSO</td>
<td>26%</td>
<td>$ 78</td>
<td>2.9</td>
<td>-$8.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>$300</td>
<td>7.8</td>
<td>-$24.3</td>
</tr>
</tbody>
</table>

The 2.9% operating margin measured in the study, and even the 4.9% operating margin observed for non-state airlines in more open and free economies fall well short of the margins required for the industry to meet its cost of capital. Chart 8.1 and Table 8.2 demonstrate the contribution of each industry segment to the 2.9% operating margin achieved, and the shortfall from the 11% benchmark established in this research. By modelling this shortfall for a later year of this study (revenue of $300 billion) the impact is quantified as a loss of economic value of $24.3 billion.
Fig 8.1 shows the contribution to the aggregate operating margin of 2.9% and the shortfall

![Graph showing contribution to operating margin](image)

Shortfall from 11% ● Contribution to 2.9%

8.2.1 Better institutions translate into better margins

Testing of the hypotheses that addressed institutional quality consistently found better operating margins for airlines based in countries with higher institutional quality (economic freedom). State ownership, even in the higher freedom economies, was found to impact negatively on airline results, and to reduce operating margins by 1.1 percentage points.
In Europe, the privatisation of large state-owned airlines is nearly complete. Some revenue is identified in the study for the high freedom state-owned segment (HFSO) in Europe. This revenue can be attributed to periods of transition to privatisation for airlines including Lufthansa and to the restructuring of Swissair. From the research findings it is apparent that HFSO in Asia (Singapore Airlines and China Airlines in Taipei) operate with a corporatised commercial focus. Air New Zealand remains in state ownership after its 2001 bankruptcy restructure, but is similarly profit focused in its approach.

An important finding of this research is that the privatisation of airlines in countries with poorer institutional quality cannot overcome the negative impact of a poor institutional environment. Carriers in countries with poorer institutional quality deliver a shortfall in operating margin of three (3) percentage points against airlines in the more open and free economies.

A typical commercial aircraft has an operating life of approximately twenty years. This research demonstrated that (in aggregate) one quarter of the airline industry has exhausted one full generation of fleet renewal without creating a return on the capital employed. Fleet replacement and growth has come from new capital injections or from state guaranteed borrowings and not from the airlines’ capacity to fund future growth. Furthermore, the investment has been made in businesses that have demonstrated no capacity to deliver adequate returns over the longer term. This not only sees investors (predominantly state owners in this research)
investing capital inefficiently, but by expanding unprofitable capacity this action places the profitability of the wider industry under pressure.

8.3 A European model

Deregulation in Europe has lead to the consolidation of large full service airlines across national borders. The growth of pan-European low cost airlines followed privatisation of major state-owned airlines and regional deregulation. In the short run this deregulation has not, even when linked to more liberal trans-Atlantic traffic rights agreements, led airlines closer to the recovery of capital costs. Rather Europe has seen the entry of LCCs focused in the markets of the more successful full service carriers. The LCC segment in Europe has apparently identified the markets more likely to deliver returns on capital. The impacts of both the North Atlantic multi-lateral liberalisation and the consolidation of the full service airlines in both Europe and the United States offer opportunities for further research.

This study identified the impact on operating margins for full service airlines whose regional services came under pressure from LCC entrants. The findings are shown in Table 7.10 and identified a fall of 1 point of operating margin for the HFNS segment in Europe that was in direct competition with LCC entrants after 2001. Findings of modelling of the impact of LCC airlines in the more open markets of the European segment show a margin decline for the full service network carriers of approximately $480 million.
Table 8.2 reveals the impacts of state-ownership and institutional quality on airline margins in Europe. The findings indicate that privatisation has a positive impact on operating margin. Limits on state aid have forced greater discipline onto Europe's airlines, and have seen the restructure and sale of chronic loss makers Alitalia and Olympic Airways. Extension of limits on state aid into other regions would be expected to lead to similar rationalisations in the industry.

Table 8.3 demonstrating the scale of impacts from ownership and institutional factors in Europe

<table>
<thead>
<tr>
<th>REGION: STATE OWNED</th>
<th>EUROPE: NON STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMALLER INSTITUTIONAL IMPACT (free)</td>
<td>PROFIT MAXIMISING BASE CASE</td>
</tr>
<tr>
<td>-97.7%</td>
<td>-4.2 margin points</td>
</tr>
<tr>
<td>GREATER INSTITUTIONAL IMPACT (less-free)</td>
<td>-81.4%</td>
</tr>
<tr>
<td></td>
<td>-3.5 margin points</td>
</tr>
</tbody>
</table>

The pressure on margins from an increased LCC presence has seen European full service airlines merging and consolidating (including British Airways and Iberia). The full impact of this consolidation is not captured in these findings, and presents an opportunity for further research. The full impact of the liberalisation of the
trans-Atlantic market is also not captured in this research. Consolidation of the airline industry in the United States has lead to a more muted increase in capacity in the recovery from the Global Financial Crisis. Similarly restrained behaviour can be expected from a more consolidated European industry. Returning to the Cournot-Nash equilibrium, as the European industry consolidates, airlines assume some control over capacity changes, at least in the multi-lateral North Atlantic market.

8.4 The Asia – Pacific paradox

The findings for the Asia-Pacific region can be summarised in a paradox. In the more free economies, privatisation does not matter. In the less free economies, privatisation does not help. This is illustrated in Table 8.4.

Table 8.4 illustrating the scale of impacts from ownership and institutional factors in the Asia-Pacific region

<table>
<thead>
<tr>
<th>REGION: ASIA-PACIFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATE OWNED</strong></td>
</tr>
<tr>
<td>SMALLER INSTITUTIONAL IMPACT (free)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>GREATER INSTITUTIONAL IMPACT (less-free)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>NON STATE</strong></td>
</tr>
<tr>
<td>PROFIT MAXIMISING BASE CASE</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
The industry consolidation witnessed in Europe and North America has created three to four large carriers groups that now make up more than half of the market. This consolidation looks unlikely to follow in the Asia-Pacific region. Ownership requirements remain in place and major full service airlines remain in state-ownership, even as ASEAN moves towards a more integrated aviation environment. The LCC segment is growing rapidly in the Asia-Pacific region. Unlike Europe, low cost carriers in the Asia-Pacific area are operating longhaul services, with both Air Asia X and Jetstar flying widebody jets on routes linking Australia, Southeast Asia, Japan, China, and Europe.

8.4.1 Low cost carriers go where regulators fear to tread

The low cost carrier segment in ASEAN has shown a willingness to launch multi-state operations, with Air Asia, Tiger, and Jetstar operating subsidiaries in multiple countries. Liberalisation of ownership rules on at least a regional basis would reduce complexity and open wider regional markets to the LCC segment. The full service carriers in the higher freedom economies have already secured a position in the low cost segment, with Qantas operating Jetstar subsidiaries in Singapore, Vietnam, and discussions mooted for a joint venture with Japan Airlines. Singaporean carrier Tiger Airways is part-owned by Singapore Airlines, and has established a domestic carrier within Australia. In Japan, full service carrier All Nippon Airways is developing a joint venture with Malaysian LCC Air Asia. As regulation moves slowly, the more effective airlines are finding hybrid structures to overcome the barriers
The lack of a regional framework in the broader East Asian region and the absence of consolidation opportunities amongst the ASEAN flag carriers assume less significance as the LCC segment establishes this new regional business model. In particular the linkage now being established between large Southeast Asian LCC Air Asia and Japan’s All Nippon Airways demonstrates that in the absence of regulatory change and market liberalisation, airlines will find alternative solutions.

8.5 Middle East – build it and they will come

The airlines of the Arabian Gulf are replicating the growth pattern of Southeast Asian carriers. As widebody aircraft lowered unit costs in the 1970’s Southeast Asian airlines captured 6th freedom opportunities over geographically advantageous hubs. The value of obtaining liberal access to traffic rights (ASEAN 1979) can be seen for the Gulf carriers now. Substantial investment in both fleet and infrastructure is raising the market presence of these airlines, and causing concerns amongst the full service carriers in Europe (Flint 2011).

Findings from the analysis show the airlines of the Middle East achieving lower operating margins than the other regions in the study, and adopting atypical strategies for full service carriers at times of lower GDP growth by pursuing market share gains rather than restraining operations. This segment is in a phase of growth, with large infrastructure investments designed to support a future role for Arabian Gulf states in global aviation.
The absence of revenue and cost data from Qatar Airways and Saudia in the Middle East region, and from Vietnam Airlines and Royal Brunei in Southeast Asia imposed some limitations on the analysis in this thesis. No evidence is publicly available to draw reliable conclusions, but greater reporting transparency from state-owned carriers would reduce speculation around levels of (un)profitability and of subsidies. Where rich and more detailed cost data is available, it tends to be reported by stock market listed carriers with mandatory reporting requirements. Access to data of this quality would allow a more critical analysis of airline unit costs. This may help to reveal the aspects of the business that generate the relatively stronger results for listed airlines in more open economies and the poorer performance for state-owned airlines in less free ones.

Table 8.5 illustrating the scale of impacts from ownership and institutional factors in the Middle East

<table>
<thead>
<tr>
<th>FRAMEWORK: MIDDLE EAST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATE OWNED</strong></td>
</tr>
<tr>
<td>SMALLER INSTITUTIONAL IMPACT (free)</td>
</tr>
<tr>
<td>-120.4%</td>
</tr>
<tr>
<td>-5.9 margin points</td>
</tr>
<tr>
<td>GREATER INSTITUTIONAL IMPACT (less-free)</td>
</tr>
<tr>
<td>-51.0%</td>
</tr>
<tr>
<td>-2.5 margin points</td>
</tr>
</tbody>
</table>
8.5 Europe as the template for change

The European Union has made progress in rationalising the air transport industry by creating an open regional market and by placing tight constraints on government subsidy. The European Union recognised that legislating for central approval of state aid that might otherwise give favoured treatment to some businesses would protect competitors from harm, avoid market distortions, and promote the long-term competitiveness of Europe (European Union 1999).

An important change that underpins the open regional market is the removal of state-based ownership provisions. This has been further reinforced through the negotiation of regional level air service agreements on capacity to replace the extensive list of bilateral agreements that were in place before deregulation. The European Union continues to pursue the concept of multi-lateral capacity access and cross-border (even cross regional) ownership. This encourages the consolidation of airlines, offers a wider range of market opportunities for airlines in the regions, and broadly supports a steady deregulation of aviation.

8.6 Implications of this research

The findings of this research show that the status quo in international aviation will lead to the continued destruction of economic value as airlines fail to meet the cost of capital employed in the industry. The 'do nothing' option must be challenged. Taking no action is the easiest and arguably the most likely option. Given so little progress on reforming international aviation over more than 50 years of jet operations, change is unlikely. The consolidation of airlines in Europe and North
America has started the process however, and the creation of multi-lateral markets in Europe and on the North Atlantic has further advanced the process. Extension of these first steps to other regions would open the way to a more economically viable and stable industry.

Deregulation in the Asia-Pacific region seems more likely to be driven by the low cost segment that has already established multi-state ownership structures to circumvent ownership rules and access traffic rights from multiple markets. As noted earlier, the lack of a legally binding framework in the ASEAN states, and the absence of significant regional consolidation in Northeast Asia make reform of the industry more difficult to begin than it has been in Europe and North America.

Figure 8.2 presents the options facing international aviation. The ‘do nothing’ case offers a continuation of a fragmented industry with inadequate return on capital. Regions that establish multi-lateral relationship may rationalise regional markets such as Europe and North America, and may improve the economic viability of services within and between those markets, but the remainder of the industry will continue to produce poor margins. The state-owned airlines in lower freedom countries are likely to continue to produce operating margins close to break even, making little to no contribution to their capital costs.
Figure 8.2 outlines a potential pathway to economic viability for the airline industry.

The complete deregulation of the industry would require the opening of all routes and markets to all airlines that could prove operational and financial capability. Ownership would be permitted across borders. Access to routes would depend on access to airports that are often constrained by slot limitations, and also access to an adequate fleet. Such a change would require a twenty-first century Chicago Convention, and appears unlikely in an environment where nations and airlines still haggle over bilateral access to individual cities.

A first step that requires significantly less disruption would be the adoption of the current European Union approach, with its region-to-region multi-lateral market access, agreement for foreign ownership, and stringent controls on the provision of state aid. It is likely under this approach that provisions would need to be made for states that are in the process of developing aviation industries and
infrastructure, and that those airlines may require a period of state investment. The question to be addressed by policy makers is when market building ends and profit building begins.

In line with the process already observed in Europe and North America, the predicted outcome would be the continued consolidation of airlines. The outcome of this consolidation would be greater control of capacity, and in turn the opportunity for improved margins.

8.7 Conclusions

This research sought to explain the impacts of institutions on airline strategy. Operating margin was adopted as a broadly available measure of the financial performance of the international airline industry. A longitudinal data set covering nineteen years of the airline industry provided the basis for analysis. The impacts of institutions and ownership were shown to vary from region to region, but the research developed clear and unambiguous findings that a poor institutional environment with lower levels of economic freedom was linked to the poorest profitability and strategy implementation. Where poor institutional quality and state-ownership were combined, operating margins fell close to zero.

The research validated the effectiveness of integrating strategy theory to build an explanatory framework or conceptual model. The combination of Porter's (1980) generic strategies with Lengnick Hall and Wolff's (1999) strategic logics provided an effective map of both airline business models and the likely behaviour of the
carriers in any segment. This theoretical framework also provided a deeper understanding of the impacts of business model innovation, represented by the emergence of low cost airlines. Two market segments also offer opportunities for further research. The first is the rapid growth of commercial aviation in China, which will create a new cluster of airlines able to link the Asia-Pacific region with Europe using large hub airports already established in Beijing and Shanghai. The second is the increasing role of low cost airlines operating long-haul flights, particularly as subsidiaries of larger airlines. The low cost model offers the existing full service network airlines in the Asia-Pacific region a disruptive strategy to deploy against the growing competitive pressures from Middle East based airlines. Low cost long-haul operations have met with mixed commercial success, and these variable results invite further research and study.

This research has quantified the negative economic impact of the current industry structure, identified in the current European Union approach a tentative way forward, and highlighted the segments of the airline industry that are in greatest need of consolidation and restructure. Further research will evaluate the impacts of the current round of airline consolidation in higher freedom economies, and the continuing disruptive role of low cost aviation.

Further depth could be achieved through interview-based qualitative research designed to explore the aspects of corporate culture and institutional pressure that impact on the less financially successful carriers. This research could be expected to identify the drivers of less effective management behaviour in areas such as employment practices or asset purchase decisions, that lead to less financially
successful business outcomes. Periodic updating of the database constructed for this research is intended to support ongoing study of the airline industry's changing emphasis towards the Middle East and China.

Changing national institutions takes a generation or more. Institutional quality has been demonstrated through the Fraser Institute Economic Freedom of the World Index used in this research to be improving only slowly. For the regulators and aviation policy strategists in government, and for those shaping the institutions of aviation, the question that must be asked is; for how many more years can the industry spare $25 billion dollars of economic value to sustain a broken regulatory structure. Aviation provides essential commercial linkages, and brings tourist revenue (often to developing states). It continues to labour under a regulatory regime designed to carve up the value of air routes in the closing days of a war almost seventy years ago. The process that assigned value to the rights to air routes now fragments and hobbles a global aviation business with regulations that would seem absurd in other industries. The challenge is to find the 21st century replacement for the Chicago Convention.
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### Appendix 1. Pivot table testing of hypotheses

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### Appendix 2 - Strategic issues

#### Europe

- Privatisation of major flag carriers and of airports
- Growth of LCC regional airlines
- Mergers of major flag carriers
- Regional competition from high speed rail.
- EU deregulation of Air Service Agreements permitting regional cabotage and regional-level treaty negotiations with USA/Canada
- Environmental pricing and Emissions trading

#### Middle East

- Rapid expansion of premium state-owned FSNC with a high dependence on 6th freedom traffic flows.
- Heavy state investment in hub airport infrastructure
- Growth rather than profit-maximising strategies

#### Asia-Pacific

- China
  - Rapid growth of Chinese carriers and supporting infrastructure at key gateways
  - China Eastern – Shanghai airlines merger after rebutting Singapore Airlines equity offer
  - Limited integration of air/land transport with airlines, airports, and high-speed rail networks controlled by different state agencies
ASEAN
- Entry of LCC using cross-border subsidiaries to overcome restrictive Air Service Agreements
- Continued state involvement, including restructure of MAS and Garuda, and the recapitalisation of Thai Airways
- Limited progress on intra-ASEAN deregulation

Japan
- The deteriorating performance of JAL is captured in the study, but the government-led restructure of the airline in 2009-10 following bankruptcy falls outside the study period,
- Very limited LCC activity
- Continued development of regional airports fragmenting markets

Korea/Taiwan
- Highly geared airlines with large exposure to freight business.
- Limited LCC competition

Hong Kong/Macau
- Acquisition of Dragonair by Cathay Pacific.
- Air China- Cathay Pacific cross share holdings
- Failure of two longhaul LCC – Viva Macau and Oasis Hong Kong.

Australasia
- Domestic markets in Australia and New Zealand opened to foreign owned airlines.
- Rapid growth of LCC segment in domestic and regional markets.
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