Restructuring Air Freight Chains: Strategic Options for Competitive Advantage

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Abstract

International air freight services are a vital revenue stream for international airlines. Notwithstanding, many airlines still consider air freight as an economy of scope by-product of their passenger operations, and have, until now, restricted their air freight service offerings to airport-to-airport transportation.

However, there are three key pervasive factors that have significantly influenced the international air freight industry over the past decade and which have created particular pressures for change in the strategic options developed and implemented by international airlines in air freight transportation. The first is the adoption by business of supply chain management, and more, specifically, their participation in value-driven chain structures involving transactional relationships between corporate players in logistics pathways between sellers and buyers. The second is the rapid market growth of the integrated freight carriers, such as FedEx and United Parcel Service (UPS). The integrators’ success has come from the provision of customer-focused logistics solutions, in effect, a ‘one-stop shop’, whereby they handle all aspects of the air freight transportation, from pick-up through to the final delivery to the end customer. The third relates to what Hamel (2002) has referred to as ‘strategy decay’ – in the case of international airlines the increasing inadequacy of their air freight strategies to capture and deliver value and thereby achieve competitive advantage that may have in earlier times, been more or less appropriate.

This study examines how international airlines deliver and capture value in the air freight transportation of Victoria’s southern and Western Australia’s western rock lobsters to Hong Kong. These two markets were selected in order to provide different market contextual settings and because the air freight mode is extensively used by both Victorian and Western Australia-based lobster exporters, as the speed of air freight transportation is critical to these shippers ability to supply Hong Kong, Victoria’s and Western Australia’s major lobster export markets, with premium products in the fastest possible elapsed time. In order to conduct this research, it was necessary to develop a conceptual framework, which was based on insights from the transportation and strategic management literature, and, in particular, the works of Cox (2002, 2004) on power and value appropriation in
supply chains, and Robinson’s (2002a, 2003, 2004, 2009) paradigm for understanding freight movement, and particularly, the role played by third party service providers in facilitating freight transportation.

This thesis utilized an in-depth case study research design. The objective of the study was to advance the limited current knowledge on how airlines capture and deliver value in air freight transportation. In addition, the case study involved the in-depth mapping of the chain structures to reveal the essential structures, functionality and contractual and corporate linkages that constitute the chain systems. The case study utilized Cox’s (2000, 2004) typology of power to determine the power regimes present in the chains, and importantly, what mechanisms and processes form the basis of the respective chain actors’ basis of power, and hence, the degree of value captured within the chains. The final phase of the research approach examined the international airlines relational management styles influence on value capture when acting as a buyer of services and a supplier of air freight capacity and services. These insights were used to determine the alignment of the international airlines buyer and supplier relationships in the air freight chains in which they participated. Finally, the strategic options available to international airlines to enhance their power circumstances, and hence, value capture in international air freight, were defined.

A major conclusion of this study is that the international airlines have the potential to capture greater value from their air freight services and improve their power positions in air freight chains through the definition and implementation of innovative logistics serviced-based strategies. Importantly, the alignment of business relationships and the integration of the supply chain functions that focus on the end-to-end, cost efficient movement of freight are vital to the actors’ ability to capture and sustain competitive advantage. The major advantage of such supply chains is their ability to deliver competitive advantage and value to shippers or consignees, thereby enabling the respective chain actors to capture greater levels of value.
Statement of Originality

To Whom It May Concern

"This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself."

............................
Glenn Baxter
December 2010.
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<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ABARE</td>
<td>Australian Bureau of Agricultural and Resource Economics</td>
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<tr>
<td>ACS</td>
<td>Australian Customs Service</td>
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<tr>
<td>AQIS</td>
<td>Australian Quarantine and Inspection Service</td>
</tr>
<tr>
<td>ASA</td>
<td>Air Services Agreement</td>
</tr>
<tr>
<td>BITRE</td>
<td>Bureau of Infrastructure, Transport and Regional Economics</td>
</tr>
<tr>
<td>DOTARS</td>
<td>Department of Transport and Regional Services</td>
</tr>
<tr>
<td>FBL</td>
<td>Fishing Boat License (Western Australia)</td>
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<tr>
<td>FRMA</td>
<td>Fisheries Resources Management Act 1994 (Western Australia)</td>
</tr>
<tr>
<td>FRMR</td>
<td>Fisheries Resources Management Regulations 1995 (Western Australia)</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>ITE</td>
<td>Individual Transferable Effort (Western Australia)</td>
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<tr>
<td>ITQ</td>
<td>Individual Transferable Quota (Victoria)</td>
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<tr>
<td>LML</td>
<td>Legal Minimum Length</td>
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<tr>
<td>MPG</td>
<td>Ministerial Policy Guidelines (Western Australia)</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
</tr>
<tr>
<td>QMS</td>
<td>Quota Management System (Victoria)</td>
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<tr>
<td>RACA</td>
<td>Regulated Air Cargo Agent</td>
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<tr>
<td>RLFAL</td>
<td>Rock Lobster Fishery Access License (Victoria)</td>
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<tr>
<td>RLFMP</td>
<td>Rock Lobster Fishery Management Plan (Victoria)</td>
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<tr>
<td>RLIAC</td>
<td>Rock Lobster Industry Advisory Committee (Western Australia)</td>
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<tr>
<td>SCM</td>
<td>Supply Chain Management</td>
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<tr>
<td>TAC</td>
<td>Total Allowable Catch (Victoria)</td>
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<tr>
<td>TACC</td>
<td>Total Allowable Commercial Catch</td>
</tr>
<tr>
<td>TAE</td>
<td>Total Allowable Effort</td>
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<tr>
<td>WCRLMF</td>
<td>West Coast Rock Lobster Managed Fishery</td>
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CHAPTER 1: INTRODUCTION

1.1 Air Freight: a Growing Market

The world air freight industry has grown rapidly in recent decades and is now an integral part of the world economy, carrying around 40 per cent of the annual world merchandise trade by value (McConville 2001, p. 321). With its growing significance, air freight has assumed a prominent position from which states, regions, and firms can achieve competitive advantage in the increasingly competitive global markets. Indeed, Leinbach and Bowen (2004, p. 299) note that ‘air cargo has become the principal mode of international transport for a wide variety of (especially knowledge-intensive) goods’. The range of ‘air eligible’ products continues to grow as more firms seek time compression in their supply chains and use air freight as a key supply chain strategy to achieve competitive advantage (Leinbach and Bowen 2004, p. 299). Figure 1.1 indicates that over the past two decades the movement of world airborne trade grew from 8.7 million tonnes and 45 billion freight tonne kilometres performed (FTKs) in 1989 to 22.9 million tonnes and 117.1 billion FTKs in 2009.

Figure 1.1. Growth in world air freight traffic, freight tonnage and FTKs, 1989-2009.
Note: See Appendix A1 for supporting data.
While air freight still accounts for only a relatively small share of global trade (especially when compared with the physical volume of ocean freight), its significance has risen rapidly over the past two decades. Leinbach and Bowen (2004, p. 301) have argued that the growth in world air freight traffic has been driven by several related factors. First, the rapid growth in global trade has resulted in greater air freight volumes. Second, knowledge-intensive products with high value-to-weight ratios comprise a growing share of global trade. Such products can more easily sustain the much higher transport costs with air freight vis-à-vis alternative surface based transport modes. Third, the development of faster, larger capacity, longer range aircraft has contributed to a long-term downward decline in real air freight rates of about 3.0 per cent per annum, rendering air freight services more affordable for more lower-value goods (Bowen 2004, p. 3; Bowen and Leinbach 2003, p. 310).

Fourth, the liberalization of air freight services in many markets has enabled the expansion of air freight services and an intensification of competition, reinforcing the decline in world air freight rates. Fifth, the globalization of economic activity and concomitant disaggregation of production networks have raised the importance of air freight services not only to individual companies but also to regions and nations. Air freight enables nations and regions, to efficiently connect to distant and remote markets and global supply chains in a fast, reliable manner. Hence, in the evolving fast-cycle logistics era, nations and regions with good air freight connectivity have competitive trade and production advantages over those without such capability (Kasarda and Green 2005, p. 459). Finally, the proliferation of just-in-time inventory strategies has helped to redefine air freight for many companies from an emergency recourse to a regular part of their supply chain management strategies, which is due to the consequent emphasis on speed in globally dispersed production networks and air freight over slower surface-based transport modes (Bowen 2004, p. 3; Leinbach and Bowen 2004, p. 301).

Airbus (2007, p. 112) and Boeing (2008, p.8) predict an average 5.8 per cent and 5.9 per cent annual growth in world freight tonne kilometres (FTKs) over the next 20 years. This compares with a forecasted growth of 4.9 per cent over the same period for passenger
traffic (Airbus 2007, p. 6). The projected growth in air freight reflects a continuation of the actual growth rate that the industry has experienced over the past 30 years of around 7.1 per cent, resulting in a ten-fold increase in traffic volume over the period (Scott and Crabtree 2006, p. 50). The size of the world air freight and express market is now valued at $USD75 billion (Micco and Serebrisky 2006, p. 26).

Because of Australia’s relatively remote geographical location, air freight transport plays a significant role in the country’s international trade. Air and ocean transport are the only two modes available for any trade being shipped to or from Australia. Thus, the international air freight industry has become increasingly critical for the Australian economy, valued annually at $AUD 87 billion and handling 690 000 tonnes of air freight (BITRE 2008d, p. 9).

Surprisingly, most airlines continue to regard air freight as an economy of scope by-product of their passenger operations and have until now limited their services to an airport-to-airport product, primarily marketed by the air freight forwarding industry and often priced on a marginal or incremental basis. This has resulted in a significant erosion of airline yields and margins and has placed airlines in a weak power position in international air freight chains and has exposed them to the innovative logistics solutions developed by the integrators. Consequently, the airlines failure to implement shippers’ requirements for ‘end-to-end logistics solutions’ has enabled their integrator rivals – DHL, FedEx, and United Parcel Service (UPS) – to capture significant market share by operating door-to-door freight networks, particularly for high yielding time-critical products.

1.2 Air Freight Services: A Restructuring Marketplace

Not only has the air freight industry grown rapidly but, and not surprisingly, it has also been restructuring in the light of new and significant market pressures. The traditional structure of the air freight industry¹ (Figure 1.2) has been changing, and continues to change, resulting in the realignment of functions into different organizational structures. There have been acquisitions, mergers and joint ventures by the traditional air freight players – as

¹ See Appendix 1 for an overview of the various international air freight industry actors.
these firms strive to satisfy the changing shippers’ requirements for end-to-end logistics solutions. Thus, mergers and acquisitions (Deutsche Post’s acquisition of DHL Global Forwarding and EXEL Logistics in 2005 for example), have enabled the emergence of global logistics operators that control many segments in their customers’ supply chains (Gooley 2000, p. 75).

![Figure 1.2. Relationships among firms in the international air freight industry. Source: The International Air Cargo Association (1998, p. 4).](image)

The economic rationality for mergers and acquisitions is rooted in the firm’s objective to increase its size, organizational growth, economies of scale, market share and power. Other motives for mergers within the international air freight industry include gaining instant access to markets, distribution networks, obtaining access to new technologies or diversifying. Acquisitions make sense in the international air freight industry as they broaden the service offering of the two parties (for example, DHL Global Forwarding acquisition of EXEL in 2004 provided an enhanced logistics and warehousing capability). Mergers, however, have not been limited to air freight forwarders; in May 2004, Air France and KLM merged their respective operations to create one of the world’s largest air freight operations and are now offering an integrated and coordinated service offering on what they call a “one face to the customer” basis (Carding 2006, p. 12). Advances in technology
and intermodal integration have also played a significant role in this process (Knee 2001, p.58). Consequently the ability of these firms to provide global, fully integrated door-to-door supply chain solutions, has resulted in new levels of market power and industry concentration.

In addition, the necessity to serve firms with truly global logistics requirements and distributive infrastructure has helped stimulate the formation of alliances within the global air freight industry. Based on their global route networks, airlines are cooperating in air freight transportation through common service options, sales, service standards, and compatible information technology systems. The SkyTeam Cargo alliance which combines Air France/KLM, Delta Airlines and others, is the most prominent global air cargo alliance (Schwartz 2006, p. 1471). Significantly, these alliances have emerged among airlines and air freight forwarders and are partly intended to meet the competitive challenge posed by the integrators (Bowen 2004, p. 9).

The most widespread challenge to the traditional air cargo system has come, however, from the integrated carriers. The integrated carriers offer a variety of products to shippers and supplement air services with extensive ground transport to provide customers with time-definite door-to-door delivery with continuous tracking, and, if necessary, logistics expertise to support just-in-time inventory strategies (Reynolds-Feighan 2001, p. 433). As their core business comes under threat from electronic communication mediums, the integrators are increasingly turning into more diverse markets such as traditional ‘hard freight’ industrial consignments in direct competition with forwarders and airlines (Döring et al. 1999, p. 266; Shields 1998, p. 185). FedEx is now the world’s largest air freight carrying airline, with more than 10 per cent of the world air freight, while UPS is the fourth largest carrier (Doganis 2002, p. 305).

1.3 Value Migration and Strategy Decay and New Strategic Options

1.3.1 A shift in value?

In effect, what is happening in the air freight industry is no less and no more than what is happening in the freight industry more generally, and it is well discussed, at least in service
terms, in Slywotzky's work on value migration (1996) and applied in a freight context by Robinson (2006, 2009) and Weston and Robinson (2008). For Slywotzky, 'value migrates from outmoded business designs to new ones that are better able to satisfy customers' most important priorities' (1996, p. 12), and, as a consequence, firms operating in markets impacted by value migration will need to redefine appropriate ways to capture the new value required.

Hamel's focus on strategy decay (2002) argues along a similar line and Hamel (2002, p. 35) and Hamel and Välikangas (2003, p. 58) have usefully highlighted the notion that a firm's strategies will most likely require constant redefinition as strategies lose their economic potency over time; and that firms need to constantly review functionality and positioning to ensure effective market growth. Indeed, a firm's future profitability and viability is at risk when its strategies are being eroded through strategy decay (Lewis and Loebbaka 2008, p. 147). Thus, firms must not simply seek incremental, continuous improvement but instead aim for ‘…radical innovation…innovation that has the power to change customer expectations, alter industry economics and redefine the basis for competitive advantage’ (Hamel 2002, p. 62).

1.3.2 Why a shift in value?

Christopher (1998, p. 28) has argued that industry has now entered the era of 'supply chain competition' where supply chains rather than individual firms compete. Hence, firms can no longer act as isolated and independent entities in competition with other similar 'stand-alone' organisations. Instead, they need to create value delivery systems that are more responsive to the rapidly evolving markets. Firms need to be much more consistent and reliable in the delivery of that value and this requires that the supply chain as a whole be focused on the attainment of these objectives (Handfield and Nichols 2002, p. 3).

The rapid development of technology, combined with increased global competition and more stringent customer demands, has put strong pressure on firms to improve the quality

\[\text{Value is defined as 'customer's perceived preference for and evaluation of those product attributes, attributes performances, and consequences arising from use that facilitate (or block) achieving customer's goals and purposes in use situations' (Woodruff 1997, p. 142).}\]
of their products/services and processes. Competition involves not only price but also a wide variety of product and service attributes (Omta et al. 2002, p. 1). Accordingly, these competitive pressures have promoted supply chain management\(^3\) as a key corporate strategy (Beers et al. 1998, p. 295). The pressure to do more with less inexorably forces firms to focus on few, unique, difficult to imitate competencies while establishing cooperation and alliances in functions in which they do not possess distinctive competencies. The capability of building and maintaining inter-organisational relationships is increasingly viewed as key to sustained competitive advantage (Omta et al. 2001, p. 1).

Firms pursue business objectives, for example, market share, growth, and profit-making, given the available resources, technological opportunities and environmental conditions. They seek cooperation in chains if this enhances performance levels compared to spot market operations. Together, they organise and govern the consecutive steps from raw materials and intangible inputs to consumer products and services.

Importantly, the advent of a supply chain perspective has contributed to the changing nature in which transportation firms conduct their business. Carriers have been transformed from product dispensers and distributors to become a vital element in supply chain performance, thus extending the scope of their operations (Panayides 2002, p. 403). Contemporary firms, such as international airlines, need to play a critical role in supply chain integration as shippers are placing increasing value on their requirement for an integrated full door-to-door air freight service, including the physical product and information flows (Hebert et al. 1998a, p. 116). International airlines, along with other transport modes, have to satisfy shippers’ requirements in terms of frequency, punctuality, efficiency, and geographical coverage. Transport firms and third party logistics providers are now paying more attention, therefore, to the delivery of value and their position within established networks (Coyne and Dye 1999, p. 100). In this thesis it is argued that it is of special importance to define all end-to-end international air freight-oriented freight movements as chain structures involving transactional relationships between corporate players in logistics pathways between sellers and buyers. Further, for third party service

\(^3\) Supply chain management is reasonably defined by Stadtler (2004, p. 11) as ‘the task of integrating organisational units along a supply chain and coordinating material, information and financial flows in order to fulfil (ultimate) customer demands with the aim of improving the competitiveness of a supply chain as a whole.'
providers (3PSPs) all business is transacted in chains; and though chains compete with chains to deliver the value that customers require, third party service providers compete against their competitors to provide service within that specific chain. Effectively, in end-to-end freight chains, the customer selects the value offered by the chain rather than of any individual firm participating in it (Robinson 2006, p. 46). All firms in competitively structured chains from seller to buyer are integral to the operation of the chain and to its ability to deliver the value required by the customer; but each has a differing ability to set prices and to capture margins reflecting differences in power relationships along the chain.

1.3.3 The new ‘value’ in air freight markets

Robinson (2003, p. 1) argues that ‘for buyers of freight services – whether manufacturers, rural and primary producers or retail giants – the pressing need to control costs in supply chains has spawned numerous strategies within a broader supply chain management framework that seeks sophisticated levels of operational as well as corporate integration – and ideally, fully integrated corporate and inter-corporate business processes. For sellers of freight services – traditional ‘transport’ providers now best described as third party service providers intervening between buyer or shipper and customer – the focus on value delivery in competitive markets is underlying urgent attempts to expand control over freight movements and to capture an increased share of value over the entire movement chain. It is resulting in rapidly restructuring corporate and chain frameworks’.

A supply chain perspective has several key implications for transportation service providers. First, integration processes started by shippers affect, at least in the initial stage, the re-engineering of physical and material flows with considerable consequences for logistics and transportation management. Second, for shippers the delivery system has become an integral element of the supplied product, to the point that transportation and logistics receive the same evaluation as the product itself (Kleinsorge et al. 1991, p. 35). Hence transportation providers play a more significant role than in the past insofar as they are entrusted with the task of coordinating and expediting physical and information flows along multiple levels of the supply chain and of making the whole logistics system more efficient and flexible in responding to rapid market changes (Evangelista and Morvillo
1999, p. 23).

Third, restructuring the supply system often forces shippers to outsource large parts of their logistics activities, as well as to select and reduce the number of businesses with which to develop long-term favoured relations for supplying ‘tailor-made’ supply chain and transportation services. Furthermore, after the recent restructuring which has occurred in the transportation market, Sheffi (1990, p. 28) argues that ‘…it may not always be possible for shippers to achieve further transport cost reductions from lowering carrier’s prices but instead from better engineering of shippers’ logistics systems’. This results in 3PSPs implementing one-stop shopping strategies to extend their range of service offerings in order to provide total transportation and logistics services. In this perspective, these firms are gradually transforming the scope and characteristics of their service offerings. Service supply is no longer limited to transportation and handling, but also covers other services which are now perceived to be of critical importance such as warehousing, storage, packaging and unpacking, communications and inventory management. Initially, transportation service providers tend to consolidate their position within their own market sector. In a subsequent phase, they seek to extend their control and coordination of physical and information flows along the whole air logistics chain through the creation of strategic alliances with other 3PSPs. This enables transportation services providers to assume responsibility for the complete cycle of door-to-door transport. Ultimately, they are able to provide shippers with more complex logistics service offerings under agreements concluded with specialised providers, finally assuming the role of global 3PSPs (Evangelista and Morvillo 1999, p. 24).

Consequently, the international air freight market is now shifting to a position in which shippers demand complete logistics solutions rather than just turn over shipments to an airline for carriage from point A to point B. Thus, airlines are placed in a position where they need to customize their service offerings and create shipper-specific solutions. A way to achieve this is through the modularization of services, that is, offering a standard service, for example, time-definite airport-to-airport transportation plus value-added services, which address the specific requirements of the shipper in his or her present situation. These extra services will be value add-ons and warrant charging a premium rate.
At the same time, since an airlines core competency remains airport-to-airport transportation, door-to-door deliveries or site-to-site internal production logistics will require close cooperation between the airlines and 3PSPs so that the necessary infrastructure can be provided on the ground at a global level to ensure a high level of service quality (Herrmann et al. 1998, pp. 150-151).

What, then, is the ‘new’ value which must be delivered by air freight chains? The ‘new’ value may not be new at all; it is the value which buyers require and contract for. But it is the integration of the supply chain which is seen as the priority for chain efficiency and for appropriate value delivery. It is, in effect, the whole-of-chain performance that delivers value and not the efficiency of any one firm in the chain.

1.4 Air Freight Strategies: The Conventional Wisdom

Air freight strategy, not unusually, is an element in the broader strategic issues on which airlines focus. In the context of this thesis it is useful to examine, albeit briefly, this wider focus in order to clarify the particular emphasis and conceptualization which will underpin this study.

The behaviour of airlines participating in international air freight markets is a function of technology, the regulatory regime, pricing, the characteristics of customer demand, airline costs and the eagerness or otherwise of competition in a specific market. There are some established operational strategies that airlines have adopted, among them product bundling, differential pricing for commodities, hub and spoke strategies, and to a lesser degree, strategic air freight alliances. Dempsey and Gesell (1997a), Doganis (2002) and Wells (1999) all provide comprehensive accounts of the operational strategies (at the functional level) that have emerged following the widespread liberalisation of the industry in the 1980s and the 1990s. However, these exhibited behaviours are all only components of broader competitive strategies.

The generally accepted axiom of strategy in a business setting is that a firm’s goal is to maximise some objective function such as profits or sales. In so doing it seeks to capture competitive advantage. In the face of competition from rivals, the firm must decide what
course of action to take to pursue its desired goals: it can either defend its market position through various strategic moves; or the firm can take offensive action and expand its markets, or it may withdraw from markets where it is apparent that the firm cannot attract customers or achieve larger market share. There are generic strategies that have emerged over time. These courses of action can be varied and combined to suit the perception of the competitive position of the firm. Each course of strategic action is in essence an attempt to construct barriers so as to minimise market encroachment by rivals. Strategies that focus on capturing market share are extremely popular in almost every industry including Australia's international air freight industry. What makes them so popular is the perception that there is a direct connection between a firm’s profitability and its market share (Allen and Hagin 1989, p. 523; Day 1997, p. 61).

Firms with high market share are considered to satisfy customers’ requirements better and therefore, enjoy competitive advantage vis-à-vis their smaller counterparts (Schwalbach 1991, p. 299). Under a market-share based strategy, the growth of the firm is dependent upon the firm’s ability to capture a market share higher than its competitors in markets which are also experiencing fast growth. However, this view is not universally accepted with a number of researchers expressing reservations about validity and the ability to generalize the relationship between firm profitability and market share (Davis et al. 1993, p. 157; Jacobson and Aaker 1985, p. 11). Notwithstanding, market share strategies and their underpinning foundations have been extensively adopted by the corporate world.

Further, it is argued that even if some firms experience market share erosion, competition in these rapidly growing markets is unlikely to be intense as trade eventually grows at a satisfactory rate and firm’s may limit their attention to rival’s gains whilst they concentrate on satisfying their own growth. Arguably, there is some doubt about this position in the context of the international air freight industry. It is known for example, that international airlines wishing to expand their service offerings to include door-to-door services may find it difficult to achieve this objective given the substantial investment required in support infrastructure and resources (such as ground transport delivery fleets and customs brokerage services) without any guarantee that they will ultimately succeed. Moreover, the assumption that rivals will fail to react aggressively to such market share erosion is likely to
be fundamentally flawed because it fails to incorporate their expectations and business philosophies. As Wensley (1982, p. 151) observed competitors may react just as aggressively in high growth markets as they would in low growth markets if their objectives were not satisfied. Hence, in extremely competitive markets it is the difference between a firm’s expectations of future sales and the actual sales achieved that dictates competitors’ behaviour and market reaction.

There is little doubt that for international airlines the rewards associated with high growth air freight markets are substantial; but this only makes commercial sense if they can compete across markets and capture and sustain market gains. But even if that were possible, international airlines would still need to remain cognizant of the risks inherent in the uncertainties and the competitive responses from rivals, including the integrators. Many firms have attempted to secure market growth only to endure years of painful loss and ultimately an embarrassing and costly exit during a market shakeout phase in which they are less likely to have planned an upfront exit strategy.

An air freight market may not be inherently attractive or unattractive simply because it is experiencing a high growth phase. The real test is whether the international airline can capture the opportunities arising from the market growth in such a way so as to gain a competitive advantage and achieve their own market growth. In this perspective, then, international air freight actors should regard market share as an effect and not the cause of superior performance and profitability. Indeed, achieving gains in market share and returns on investment are an indication that a firm’s management has been defining and implementing strategies, whether by design or chance, that have proved successful. Accordingly, international airlines should avoid the use of strategies that singularly focus on achieving air freight market share as these may be inconsistent with their longer-term planning horizons. Focusing purely on market share strategies can undermine the consideration of superior alternative strategies such as those that will enable firms to create and capture value and satisfy end-user requirements. Moreover, situations may arise where it would be strategically and financially advantageous for international airlines to exit a market segment – this would be an indication of good management and judgment. In addition, there is a wide body of commentary in the management literature as to how
smaller sized firms can achieve high returns without simply competing on the basis of securing market share.

It can, therefore, be argued that for international airlines seeking to achieve competitive advantage and enhance their position in international air freight chains, competing for opportunity share is superior and more effective than seeking to optimize market share. International airlines should consider market share as a desirable outcome of the accumulation of opportunities arising from air freight shippers seeking to exploit existing and secure new opportunities in global markets. There are many compelling reasons to support this approach, but we restrict our justification to a few. First, competition for market share is limited because typically it is conducted within existing markets and focuses on strategies defined so as to enable the firm to develop its market share by capturing rival’s current market share. Within this environment the competitive struggle between the market leader and other market competitors is influenced by the strength and effectiveness of firm’s sales forces, strategies, pricing, advertising and product development. In addition, firms target uncommitted customers in an attempt to increase their market share (Day 1984, p. 107).

Moreover, regulatory changes, new technology developments by competitors, and management inattention can result in some leaders losing market share (Campbell 1987, p. 62). In the context of international air freight markets, the strategies employed by the actors have often resulted in the redistribution of the ‘pie’ and not on enhancing the overall size of the ‘pie’ (market) so all actors can benefit. Consequently, the competition for market share has become intense and resulted in price wars, with the concomitant decline in air freight yields, as the rivalry between the airlines and freight forwarders has intensified. Hence, a more appropriate strategy to ensure a firm’s growth and prosperity, is one that aims to expand the market so that the firms secures competitive advantage over any and all competitors selling to that firms customers (Henderson 1991, p. 5).

If an international airline pursues market share in non-traditional market segments, such as door-to-door services or cool-chain solutions, it may find it difficult to compete due to the considerable financial and technical resources and infrastructure that would be
required to support such initiatives and which may be beyond the actor’s capabilities. Indeed, Aacker (2001, pp. 213-214) argues that a program to secure market share based on tactical actions can be expensive and unprofitable, resulting in only transitory gains from attracting price sensitive customers. Firms should therefore be careful in competing for market share as they may not possess the competencies and strategic assets necessary to invest in the infrastructure required to sustain new commercial activities to change the existing trade volumes or introduce new services to sustain their competition for a share of the available business. A further persuasive reason against focusing on the competition for market share is that it is a strategy that may not underpin a secure foundation for the firm’s long-term profitability and growth and thus deliver value to shareholders.

Furthermore, there is no denying that market share and profitability are related (Hofer and Schendel 1978, pp. 127-128). However, this seemingly innocuous fact has been widely misinterpreted and misused by many firms, to the detriment of sound strategic thinking (Day 1999, p. 135). The key point being made here is that the relationship between market share and firm profitability is neither causal nor strong enough to justify the pursuit of market share by international air freight actors as a common strategy for achieving market growth.

There is, of course, a very extensive literature on airline strategy, but this brief discussion is enough to suggest that the conventional wisdom in defining airline strategy is more concerned with the firm’s place in its wider market – it is, essentially, a market-centric perspective.

1.5 Rethinking Air Freight Strategies: Firms in Chains and Markets

More recently there have been alternate views in the supply chain and chain systems management related literature by Cox (2002, 2004) and Robinson (2009) who contend that business strategy should focus on both supply chains and markets, rather than purely on markets as in more orthodox approaches. In this context the work of Cox on *supply chain power* in developing a generic supply chain framework is of special importance (Cox 1997; Cox et al. 2002; Cox et al. 2004) and it underpins our conceptualisation. Robinson
(2009) particularizes the generic framework within the specific context of freight systems. International air freight movement only occurs because in so doing it offers value and competitive advantage to the buyer and seller and to airlines, and other air freight related firms (3PSPs). Airlines and other 3PSPs intervene between the buyer and the seller to facilitate the movement of air freight, and do so not only because they deliver value but also because, in so doing they capture and accumulate value from the freight movement (Robinson 2003, p. 3). Critically, international airlines, air freight forwarders, customs brokers and many other actors exist only on the basis of trade demand; if there is no demand there is no freight movement and hence no requirement for the services of 3PSPs (Robinson 2002a, p. 246). Therefore, the movement of freight provides the essential rationale for the existence of any type of 3PSP given that transport is a service activity which typically stems from a derived demand. In some instances, firms which supply or purchase goods will provide the freight services – or at least some of the components of the freight services such as transport and warehousing. In other circumstances, third party service providers intervene in firm-to-firm transactions to effect the movement of freight (Robinson 2002b, p. 14).

In short, the logic of this position is that all air freight moves in chains; and firms involved in the movement are embedded not only in chains which are competing for particular customers or markets but in their relevant service or production markets. Firms compete against their competitor firms to enter chains; and chains, and not individual firms in them, deliver (or fail to deliver) the value which the customer and/or the customers customer requires.

This logic raises significant issues about the notions of chain power and market power, about efficiency in chains, about the way in which firms in chains extract value from the chain, and contribute value into it, and about the implications for strategy definition in such a perspective.
1.6 A Chain Systems Perspective for Defining Air Freight Strategy: The Research Problem

In this introductory chapter we have noted that the air freight industry has grown, and continues to grow, at a rapid rate; and with growth has come significant restructuring, certainly in terms of organizational restructuring. But it has been suggested also that value migration has underlined outmoded business frameworks and, in Hamel’s terms, strategy decay has occurred. Particularly, simple logistics efficiency in individual logistics operations – including airline operations – is no longer seen as the basis of effective strategy. Rather, buyers and the marketplace more generally, are demanding supply chain integration to deliver chain output that provides the value required by the buyer.

It is apparent that a macroeconomic and market-focused perspective, which is the basis of the conventional approach to airline and air freight strategy definition, might be a necessary but not sufficient condition for effective strategy definition. But more recent thinking, which argues that business strategy should focus not only on market power but also on supply chain power and the dynamics of supply chain operations, appears to be especially relevant to real-world strategy definition.

This thesis focuses, therefore, on:

- understanding the dynamics of air freight supply chains – including the way in which firms deliver value to and extract value from chains; the power relationships in chains; and the levels of integration in air freight chains; and on

- the implications which a chains systems analysis has on air freight strategy definition.

Further clarification and specification of the research problem is fundamental and Chapter 2 will:

- define, in some detail, an appropriate conceptual framework for analysis from recent work in supply chain and chain systems analysis; and
• outline a case study methodology for empirically testing the framework and a set of hypotheses derived from it.

1.7 Outline of the Thesis

The thesis falls into eight chapters. The introductory chapter has laid the foundations for the study. It has discussed the research problem, and has underlined the background to the research problem formulation. In Chapters 2 and 3 the key theoretical underpinnings, the study’s conceptual and research frameworks and the contextual setting for the study are discussed, with the objective of highlighting their relevance as to how international airlines can capture and deliver value in the air freight markets in which they participate. Chapters 4-5 presents the two in-depth case studies based on the Western Australia and Victoria to Hong Kong live lobster export air freight markets. Chapter 6 builds on the empirical work presented in Chapters 4 and 5. In this chapter the empirical findings from the study’s case studies are discussed in detail. Chapter 7 examines the strategic options available to airlines to capture competitive advantage in the freight chains in which they participate and addresses the study’s research hypotheses. Chapter 8 summarizes the results of the study and assesses the implications of the study results.
CHAPTER 2: VALUE DELIVERY AND VALUE CAPTURE IN AIR FREIGHT CHAINS: CONCEPT AND METHODOLOGY

2.1 Introduction

In 1997 Andrew Cox published his book *Business Success*, but its subtitle, ‘a way of thinking about strategy, critical supply chain assets and operational best practice’, underlined that the book would provide a significant departure from contemporary supply chain texts. The author suggested that it was ‘a work in progress’ (Cox 1997, p. 10) and a large number of papers, publications and books – particularly *Supply Chains, Markets and Power* (Cox et al. 2002) and *Business Relationships for Competitive Advantage* (Cox et al. 2004) – have subsequently refined and extended the earlier work. From the outset, Cox argued, among other things, that business success is not simply about competing with other firms in a market; that control of scarce resources is a major factor in success; and that owning, controlling and leveraging key resources in supply chains are critical. Further, Cox argued that power and power relationships in chains critically determined the firm’s ability to extract value from the chain – and business success!

Cox’s work has proved seminal in understanding supply chain dynamics and it offers an appropriate, relevant and rigorously analytical framework. This thesis further explores, in some detail, the concepts and conceptual framework offered by the work of Cox, but it does so within the overriding context of its relevance for understanding the dynamics of air freight chains and of insights which it offers for formulating appropriate and relevant strategies for air freight operators.

This chapter comprises two parts – the first part examines the fundamental elements of the Cox perspective as a basis of a conceptually sound framework for understanding the dynamics of air freight chains; and the second proposes and details a case study approach for empirically testing the framework within real-world air freight chains.
PART A: A CONCEPTUAL FRAMEWORK

2.2 Supply and Value Chains: an Important Distinction

In the late 1990s the notion of a supply (at least, in a manufacturing or production process) chain was routinely understood to refer to the chain of operations associated with the movement and transformation of raw materials into product and its transfer to the customer; but only a few researchers (Handfield and Nichols 2002; Poirier 1999, for example) saw a need to finally link what seemed to be a vague notion of value to what was happening in the supply chain. Critically, Cox meshed the notion of supply chains and what he called the value chain as simply two sides of the same coin – and set this relationship as the starting point for all subsequent analysis (Figure 2.1).

Figure 2.1. The supply chain and value chain.

Note:
Value is measured as the typical gross profit margin on the return from sales (ROS): % distribution of the revenue earned (Cox et al. 2002, p. 153).

For Cox, a supply chain is ‘the complex network of relationships that are required in order to turn raw materials into physical products and services for ultimate consumption’ (Cox
1997, p. 211). Importantly, the physical supply chain that delivers products and services to customers exists in an exchange relationship within a value chain. The value chain exists in parallel with the supply chain and refers to the flow of revenue from the end customer of any product or service, which provides the revenue for each stage of the supply chain (Cox 1999, p. 173). The supply chain and the value chain therefore exist in a fundamental commercial exchange relationship (Cox 1997, p. 211). The value chain is defined as ‘a series of financial relationships that starts with the ultimate customer buying the finished product or service and, ultimately, results in all of those who participate in the chain of supply relationships being allocated a share of the revenues flowing from the ultimate consumer’ (Cox 1997, p. 5). The relationships are shown in Figure 2.1 above. In effect, some proportion of the final price paid by the buyer is redistributed to each of the firms in the chain.

### 2.3 Power, Power Relationships and ‘Critical Assets’

The notion that some firms participating in supply chains possess more power than others is intuitively apparent and has been well documented in much of the literature; but Cox's recognition of the supply chain not simply as ‘...a series of functional stages' but also ‘...as a series of exchange relationships between buyers and suppliers’ that involve patterns and degrees of power that influence ‘..the flow of value through the chain’ (2002, p. 4) provides an important basis for further analysis. In 1997 Cox argued that for firms participating in supply chains business success required market closure and the ability to exert at least a degree of monopoly power. Firms achieved market closure by owning or controlling power resources in the supply chain and, particularly, by owning and controlling critical assets – resources that are scarce and of great utility and provide the firm with the leverage over buyers or sellers or preferably both (Cox et al. 2002, p. 3).

But in practice it is the ‘buy’ decision, and the buyer or customer, who exercises countervailing power – regardless of whether or not the seller possesses monopoly power. This recognition led Cox, in 2002, to the view that ‘it is not only the degree of

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4 For Cox et al. (2002, p. 153) value is measured as the typical gross profit margin on the return of sales (ROS). This measurement of value has been successfully used by Cox (2002) in a number of empirical studies and forms the basis of value measurement used in this study.
monopoly power that a firm has that is critical for business success but also its ability to exert power, and in so doing achieve dominance, over other chain players'. Power is understood to be ‘the ability of one actor to affect the behaviour of another actor contrary to the second actor’s interest’ (Lukes 2005, p. 37). In this context, interest relates to the ability of an actor to maximise its share of the surplus value (Cox et al. 2005, p. 33). Supply chain structures, therefore, are derived from power resources that both buyers and suppliers bring to the process of exchange.

How does a firm achieve supply chain power? The ability of a specific firm to pursue its strategic goals depends on the power circumstances in which they find themselves in. Similarly, the ability of a firm to pursue opportunities to leverage improvements in the future, to create a more conducive commercial and operational environment is also linked to their current and future power circumstance (Cox et al. 2005, p. 5). Each firm in a dyadic exchange relationship possesses some level of power which is at least partly predicated on the possession of resources that are relatively scarce as compared with those held by a rival firm (Hallén et al. 1991, p. 31).

For Cox, firms close the market by owning and controlling *critical assets*. The possession of such critical assets forms the basis by which markets can be closed to competitors and value leveraged from customers in supply and value chains (Cox et al. 2002, p. 3). Critical assets can be physical, such as air freight terminals or aircraft, and intangible, such as knowledge and brands (Turchan and Mateus 2001, p. 29). They are resources that provide the firm with the ability to lock-in advantages that sustain above average returns or below average costs. Dominance of one player over the other is seen, therefore, to be a function of the firm’s control over critical assets and other power resources. Moreover, the firm’s strategic positioning decision then revolves around the two key critical questions of what supply chain resources a firm should possess or control and how it should defend its ability to accumulate the value so derived (Cox et al. 2002, p. xv).

### 2.4 A Simple Power Matrix

Cox suggests a four-way categorization of dyadic power relationships (Figure 2.2) that rest
upon the notions of the relative utility and scarcity of resources held by the buyer and supplier as dyadic partners (Cox and Ireland 2002, p.416; Cox et al. 2006, p. 4). The matrix shows that, whenever firms operate within any buyer-supplier relationship, an objective situation of power must exist between the two firms to the exchange (Cox 2003, p. 67). Fundamentally, these characteristics can be described by a number of measures – the number of firms participating in the supply chain; the relative market share of the firm; the degree of dependence of the firm; switching costs; the relative attractiveness of the firm’s business; the differentiation of the product or service; the search costs; and the degree of information asymmetry or symmetry (Cox and Ireland 2001, pp. 208-209; Cox et al. 2004, p. 44).

![Figure 2.2. The Cox 'power matrix'.](image)

**Figure 2.2.** The Cox ‘power matrix’.

Source: Cox et al. (2000, p. 18), Reproduced with permission of copyright holder, Cox et al. (2000), *Power regimes: mapping the DNA of business and supply chain relationships*, Earlsgate Press, Boston, UK.

Note, briefly, some of the key characteristics of the power positions noted in the matrix (see, also, Cox et al. 2004, p. 44).

- The *buyer-dominance* relationship: In this scenario, the buyer possesses power attributes relative to the supplier that provide the basis for the buyer to leverage the supplier’s performance on quality and/or cost improvement, and thus, ensures that the supplier only receives normal returns (Cox 2001b, p. 13). Relationships are buyer-dominated when there are many suppliers and few buyers; when the share
the buyer takes of the supplier output is high; and when the buyer has a low requirement for the supplier’s skills. In this scenario, value flows to the customer as the supplier has few alternatives for its products or services (Cox et al. 2001, p. 32).

- **The interdependence relationship:** In this relationship, both the buyer and seller possess resources that require the two parties to the commercial exchange to work closely together. This occurs because neither party to the exchange can force the other to do what it does not wish to do. The buyer and supplier are also said to be interdependent if the relative significance and uniqueness of the resources offered by each actor are high (Cox et al. 2001, p. 12). In this power circumstance, the supplier may earn above-normal returns but is also required to pass some value to the buyer in the form of less-than-ideal returns, as well as some level of innovation (Cox 2001b, p. 13). Hence, interdependent relationships occur when there are few suppliers and few customers; when each actor is dependent on the other; and when the buyer requires the supplier’s skills, because the purchase is customised anyway (Campbell and Cunningham 1983, p. 376).

- **The independence scenario:** neither the buyer nor the supplier possesses any significant leverage opportunities over the other party, and both the buyer and the seller must accept the prevailing price and quality levels. Fortunately, for the buyer, this price and quality level is often not that advantageous or ‘ideal’ for the supplier because the supplier possesses very few leverage opportunities (other than the buyer ignorance and incompetence) and may be required to operate at only normal returns (Cox 2001b, p. 13; Cox et al. 2004, p. 42). In this circumstance, value will flow from the supplier to the buyer because competition in the market place normally forces suppliers to offer a favourable deal. If they fail to do so, the buyer may go elsewhere (Cox et al. 2001, p. 32).

- **Supplier dominance:** In this scenario, the supplier possesses all of the levers of power. It is under this power position, that the supplier would most likely possess many of the isolating mechanisms that close markets to competitors and possess many of the barriers to market entry that enable above-normal returns to be
Within such an environment, the buyer is likely to be both a price and quality receiver and will capture the value from the buyer (Cox et al. 2001, p. 32).

For Cox et al., ‘...the ideal position for earning rents – or high levels of profit on a sustainable basis – is straightforward. 'When...a company is selling to customers the ideal must always be to have monopoly ownership of inimitable supply chain resources that are needed (not merely wanted) and highly valued by everyone. When...a company is buying from suppliers, the ideal must always be to be a monopsonist, who is able to source from suppliers located in highly contested markets in which there are low switching costs and low barriers to market entry' (Cox et al. 2002, p. 7).

2.5 Supply Chains and Patterns of Power: Dyads and Power Regimes

Cox notes the possibility that any real-world supply chain may comprise single 2-firm power relationships (dyadic relationships) or patterns of relationships in which one firm may exert control over several firms – in what Cox calls 'power regimes'.

Assume that A is the buyer and B is the supplier, then A > B represents buyer power and that A has a critical asset. Conversely A < B suggests supplier power and B has a critical asset (Figure 2.3). Figure 2.3 also shows that in the case of buyer/supplier interdependence (A = B) and buyer/supplier independence (A 0 B) relationships that neither party possesses a critical asset. Most real-world supply chains, however, have within them far more complex power structures (Watson 2001, p. 37).

\[
\begin{array}{ccc}
\text{A is the buyer} & \text{B is the supplier} \\
\text{Buyer power} & A>B & \text{A has a critical asset} \\
\text{Supplier power} & A<B & \text{B has a critical asset} \\
\text{Buyer/Supplier interdependence} & A=B & \text{No critical asset} \\
\text{Buyer/Supplier independence} & A\neq B & \text{No critical asset*} \\
& *\text{Low utility and low scarcity} \\
\end{array}
\]

Figure 2.3. The four types of dyadic supply chain relationships.
In Figure 2.4, a supply chain power regime has been constructed. The regimes are based on the linkage of dyadic exchange relationships consisting of eight actors (A, B, C, D, E, F, G, H). These actors have been joined together by means of eight exchange dyads (A=B, A>B, B>C, B<D, B=E, C>F, D=G, E0H) to create a complex network of power regimes linked together to create products for end customers.

In effect, this hypothetical supply chain consists of an end-customer (A), an assembler (B), three component suppliers (C, D, and E), and three suppliers of raw materials (F, G, and H).

The B-C relation (B>C), the C-F relation (C>F), the B-D relation (B<D), the D-G relation (D=G), the B-E relation (B=E), and the E-H relation (E0H) remain static. In this hypothetical supply chain, the value flows from F to C to B as a result of the power relationships that operate to B’s advantage. C captures value from F, only to see this value captured by B. Similarly, in the double-dyadic exchange relationship consisting of B, E, and H, E is able to capture value from H due to the independent relationship between them. However, E must share part of the value with B, because these two firms conduct...
business on an interdependent exchange relationship basis. The exchange relationship between A and B is characterised as either A=B or A<B, which means that B is either to be interdependent with its customer or to have power over A.

As Figure 2.4 shows, however, the value capture outcome under both of these commercial exchange relationships is a function of B’s dependence on D. Accordingly, where A and B are interdependent with one another, A is influenced by the exploitation being visited on B by D. All of the value arising from the relationship between A and B is captured by D, which in turn shares this value with G. Finally, where A is dependent on B, B is able to capture value from A by charging a price which is significantly greater than the cost of production. Notwithstanding, B cannot retain this value in the form of higher margins; because it is required pay the inflated prices being charged by D. Hence, D shares the value captured from B with G (Cox et al. 2001, pp. 33-34).

2.6 Power and Strategy: From Positions of Weakness to Positions of Strength

Cox argues that strategy “of a firm should focus on the acquisition and exploitation of supply chain and market power, and the pursuit of rents – earnings in excess of the firm’s costs of production that are not eroded in the long run by new market entrants” (p.6); and more recently he has suggested that firms in chains will be continually exploring ways not only of managing the power relationships in which they find themselves but also in finding ways and means of establishing more ‘congenial’ power positions (Cox et al. 2004, p. 45). To this end he has conceptualized, usefully and simply and based on his power matrix, a set of strategic options from which firms as buyers or sellers might, ideally, choose appropriate pathways or ‘routes’ to more favourable power relationships. Figures 2.5 and 2.6 indicate these pathways for buyers and for suppliers respectively.

Figure 2.5 suggests that when firms act as buyers the worst situation they can find themselves in is one of supplier dominance. This is because in this situation, while the buyer may be receiving the currently best available use value in the market, the price and cost of ownership will be largely set by the supplier, who is probably earning above normal returns. Furthermore, it is likely that the supplier will determine any further innovation
because they will only innovate when they are forced to do so by potential rivals threatening to catch up (Cox et al. 2004, p. 46). The ideal situation for the buyer is to move as expeditiously as possible to locate all of their sourcing relationships into the buyer dominance quadrant.

**Figure 2.5.** Repositioning buyer leverage in the Cox power matrix. Source: Cox et al. (2004, p. 46). Reproduced with permission from copyright holder; Cox et al. (2004), *Business relationships for competitive advantage: managing alignment and misalignment in business relationships*, Palgrave Macmillan, London.

In Route 2 (supplier dominance to interdependence) the buyer is also likely to experience improvement in use value/and or costs of ownership but, because the buyer must share some of the value with the supplier in the interdependence circumstance, the benefits will be lower than Route 1. Under Route 3 (supplier dominance to independence) the gains attained would be lower for the buyer than under Route 2. This is because the buyer is not able to increase his general share of the marketplace and, while the supply market becomes more congested, the buyer does not possess the ability to influence and leverage supplier behaviour directly. Instead the buyer receives improvements in use value and costs of ownership due to the increased level of contestation occurring in the market place (Cox et al. 2004, p. 47).

In Route 4 (interdependence to buyer dominance) a buyer would anticipate significant improvements comparable to Route 2. In this scenario the buyer is able to develop and
attain greater market share and more dependency for suppliers on the buyer’s business, with the concomitant increases in leverage for the buyer over the supplier (Cox et al. 2004, p. 47).

Under Route 5 (interdependence to independence) the buyer may have the opportunity to reduce the commitment to longer-term collaborative relationships with suppliers in favour of independence power circumstances. In this situation the increased contestation in the market place makes it unnecessary for the buyer to develop long-term sharing of value strategies in preference for innovation through market contestation, with more short-term relationship management approaches (Cox et al. 2004, pp. 47-48).

Under Route 6 (independence to buyer dominance) the buyer attains much greater leverage through the ability to capture a major share of market revenue and this underpins the basis for the buyer to expect better value from the supplier (Cox et al. 2004, pp. 47-48). The leverage strategies that enable the buyer to successfully achieve this goal are to increase the buyer’s share of the market; select suppliers with relatively high dependency on the buyer; reduce buyer search costs; seek maximum degree of commoditization and standardization of supply; and increase the attractiveness of the buyer account to the supplier (Cox 2001a, p. 44).

Figure 2.6 conceptualizes the strategic options for the chain when operating as a supplier. Clearly, the most effective commercial leverage strategy for any supplier is Route 1 (buyer dominance to supplier dominance). This is because to achieve this movement a supplier needs to be in a position to move out of a highly contested market with a high degree of dependency on the buyer into a situation in which the supplier possesses a key isolating mechanism. This situation forces the buyer to become much more dependent on the supplier for any particular use value or exchange costs. Simultaneously, the supplier is in a position to increase revenue share in the market with above average returns (Cox et al. 2004, p. 48).
Route 2 (buyer dominance to interdependence) is also advantageous for suppliers. In this scenario the supplier is able to reduce the market place contestation by developing a longer-term relationship with the buyer and by creating switching costs for the buyer that would make it difficult for them to source from alternative suppliers. In this circumstance the supplier may expect to be able to increase the share of revenue and the returns achievable from a specific buyer-seller relationship because the buyer is significantly more dependent on the supplier. This strategy is taken to a higher level under Route 3 (interdependence to supplier dominance) (Cox et al. 2004, p. 49).

In Route 4 (buyer dominance to independence) the supplier may be able to create a higher level of return by developing ways of working with less powerful buyers with a smaller share of market revenue than dominant buyers. In this scenario the relative weakness of smaller buyers may provide more favourable opportunities for suppliers to capture higher returns in a highly contested market than from a contested market with dominant buyers. Under Route 5 (independence to interdependence) the supplier is able to identify ways of offering buyers increases in use value in return for a guaranteed long-term share of the buyer’s revenue, with a somewhat higher level of return than achievable.
from participation in a highly contested market place. Finally, under Route 6 (independence to supplier dominance) the supplier is typically able to use information asymmetry to capture above normal returns due to ignorance on the part of the buyer, or from the development of an isolating mechanism as described in Route 1 (Cox et al. 2004, pp. 49-50).

2.7 Value Appropriation: How Much Value Can a Firm Extract from its Position in the Supply chain?

This is a critical issue; and the Cox argument is that it depends on two critical sets of factors – on how firms work together (whether at arm’s length or collaboratively); and what power relationships exist between them. Figure 2.7 spells out, in considerable detail, the implications for value appropriation and the figure bears close scrutiny. For our purposes, however, it is sufficient in this context to note that ‘the way of thinking’ about value appropriation, as well as the actual findings, are of particular importance; and that the range of value appropriation responses is not only very extensive indeed but also suggests that real and effective integration and cooperation among firms in supply chains is likely to be seriously constrained under most real-world scenarios.
Chapter 2
Conceptual Framework

<table>
<thead>
<tr>
<th>BUYER DOMINANT ARM’S LENGTH RELATIONSHIP</th>
<th>BUYER-SUPPLIER RECIPROCAL ARMS-LENGTH RELATIONSHIP</th>
<th>SUPPLIER DOMINANT ARM’S LENGTH RELATIONSHIP</th>
</tr>
</thead>
</table>
| ● Short term operational relationship with limited close working between buyer and supplier.  
  ● Buyer adversarially appropriates most of the commercial value created and sets price and quality trade-offs.  
  ● Supplier is non-adversarial commercially and a willing supplicant, accepting work rather than high margins/profitability from the relationship.  
  ● Buyer dominance power situation (>). | ● Short term operational relationship, with limited close working between buyer and supplier.  
  ● Buyer accepts current market price and quality trade-offs.  
  ● Supplier accepts normal (low) market returns.  
  ● Both buyer and supplier operate adversarial commercially whenever possible, but normally have few leverage opportunities.  
  ● Independence power situation (o). | ● Short term operational relationship, with limited close working between buyer and supplier.  
  ● Supplier adversely appropriates most of the commercial value created and sets price and quality trade-offs.  
  ● Supplier is non-adversarial commercially and a willing supplicant, paying whatever is required to receive given quality standards.  
  ● Supplier dominance power situation (<). |

<table>
<thead>
<tr>
<th>BUYER DOMINANT COLLABORATIVE RELATIONSHIP</th>
<th>BUYER-SUPPLIER RECIPROCAL COLLABORATIVE RELATIONSHIP</th>
<th>SUPPLIER DOMINANT COLLABORATIVE RELATIONSHIP</th>
</tr>
</thead>
</table>
| ● Long term operational relationship, with extensive and close working between buyer and supplier.  
  ● Buyer adversarially appropriates most of the commercial value created and sets price and quality trade-offs.  
  ● Supplier is non-adversarial supplicant commercially, and accepts work rather than high margins/profitability from the relationship.  
  ● Buyer dominance power situation (>). | ● Long term operational relationship, with extensive and close working between buyer and supplier.  
  ● Buyer and supplier share relatively equally the commercial value created.  
  ● Buyer and supplier agree and quality trade-offs, with supplier making more than normal returns.  
  ● Both buyer and supplier operate non-adversarially commercially.  
  ● Interdependence power situation (=). | ● Long term operational relationship, with extensive and close working between buyer and supplier.  
  ● Supplier adversely appropriates most of the commercial value created and sets price and quality trade-offs.  
  ● Buyer is a non-adversarial supplicant commercially, and pays whatever is required to receive given quality standards.  
  ● Supplier dominance power situation (<) |

Figure 2.7. Value capture, power and relationship management styles. Source: Cox (2004, p. 354). Reproduced with permission from copyright holder; Cox et al. (2004), Business relationships for competitive advantage: managing alignment and misalignment in business relationships, Palgrave Macmillan, London.

Furthermore, Cox suggests that ‘…most business relationships fail because the parties to the exchange do not understand the power circumstances that are in play; do not understand the appropriate relationship management strategies to adopt given these circumstances; and often have unrealistic and undeliverable expectations as a result’ (Cox et al. 2004, p. 128).
In effect, relationships can be aligned when ‘both the buyer and supplier fully understand the power circumstances they are in now, and what is likely to be in the future’ (Figure 2.8) (Cox et al. 2004, p. 129).

<table>
<thead>
<tr>
<th>Relationship Outcome</th>
<th>Causes of Alignment / Misalignment</th>
<th>Opportunities and Threats to Relationship Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Aligned</td>
<td>Ideal operational and commercial alignment of buyer and supplier, with joint acceptance of the power situation and appropriate relationship management strategies and styles.</td>
<td>Inertia and complacency and/or myopia and opportunism over time.</td>
</tr>
<tr>
<td>2 Misaligned and Sub-Optimal</td>
<td>Buyer and supplier pursuing the required commercial outcomes, but one or both using inappropriate operational relationship management strategies and styles.</td>
<td>Alignment possible if both parties are prepared to behave objectively and eradicate subjective misperceptions.</td>
</tr>
<tr>
<td>3 Misaligned with Dysfunctional Conflict</td>
<td>Buyer and supplier pursuing non-commensurable commercial and operational goals, one or both parties seeking alternative commercial and power outcomes.</td>
<td>Limited scope for relationship alignment. Both parties may need to find different relationship partners.</td>
</tr>
</tbody>
</table>

Figure 2.8. The causes of alignment and misalignments in business relationships.


PART B: A CASE STUDY RESEARCH FRAMEWORK

2.8 Real-World Air Freight Chains: The Case Study Focus

Relationships in real-world supply chains, including air freight chains, may appear to be significantly more complex than Cox’s rigorous conceptualization would suggest. But, in fact, it is not difficult to identify within the perspective which is offered.

Value, in supply chain systems, is a critical concept; chain systems exist to deliver value and third party service providers, such as airlines, seek to capture value. How they capture it, and how much is captured and how much value the chain delivers to both suppliers and
buyers are crucial to our understanding of how firms in supply chains might formulate their strategies.

This thesis is focused on understanding and applying the elements of Cox’s perspective to the dynamics of air freight chains and, by extension, to the way in which airlines involved in air freight chains might better formulate strategies. Given chain complexities, and the demands of the conceptual framework, it is imperative to focus at a high level of detail and, therefore, to pursue the research within a case study framework. Hence, the thesis focuses discussion into two detailed case studies in order to demonstrate the dynamics of strategy definition and value capture and delivery; and it seeks to exemplify the analytical value of a framework developed by Cox and his associates.

The two case studies examine Victoria’s southern rock lobster and Western Australia’s western rock lobster to Hong Kong export air freight markets. A number of factors were carefully considered in selecting the case industry. First, the primary reason for selecting sub-cases in two discrete air freight markets was to gain some variation in the research and to obtain a broader view of international air freight chain structures, dynamics and performance and their influence on international airlines strategies to capture and deliver value based in these two important air freight markets. Second, these industries were selected because the international air freight mode is the preferred transportation mode used by both States rock lobster exporter/processors when shipping their consignments to Hong Kong. The Hong Kong seafood market is extremely competitive and it is therefore vital that all rock lobster consignments arrive in Hong Kong in a timely manner so as to ensure product quality. Hong Kong is also Australia’s largest rock lobster export market. In 2006, Hong Kong accounted for ninety four per cent and sixty per cent of Victoria’s and Western Australia’s annual rock lobster exports, respectively. Furthermore, the value of these two State’s annual rock lobster exports represented around seventy two per cent of Australia’s total rock lobster exports in 2006 to Hong Kong (ABARE 2007a: 59).

2.9 Freight Systems: a Methodology Framework

The case study research framework was guided by the recent work of Robinson (2009) who suggests that five axioms underpin any chain systems analysis.
Axiom 1: Freight moves in chains, conceptualized as sequentially structured sets of logistics functions from seller to buyer in end to end-patterns.

Critically, these logistics functions are provided by third party service providers (3PSPs) which are in the business of earning revenue so that the capacity and service offered in the chain is restricted as well as the cost and price constrained under competitive conditions. In effect, then, the 3PSP exists in the chain on the basis of delivering value to its dyadic partners, to its contractual partners and to the chain customers; and to capture that value in accordance with its corporate strategies and strategic positioning (Robinson 2009, p. 22).

Axiom 2: Freight moves only because in so doing it delivers competitive advantage, and value, to seller, buyer and 3PSPs in the chain.

Freight moves only because in so doing it provides value and competitive advantage – to the shipper, to the buyer, and to the service provider. International airlines, and other third party service providers who intervene between buyer and seller to effect the movement of freight, do so not only because they deliver value but also because, in so doing they must capture and accumulate value (Robinson 2003, p. 3). Indeed, it has been argued that industry has now entered the era of ‘supply chain competition’ where supply chains rather than individual firms compete (Christopher 1998, p. 28; Kasarda 1998, p. 24).

Axiom 3: Efficient chains will deliver superior value to customers.

Chain efficiency is, therefore, a critical determinant of a firm’s ability to capture market share and therefore the business success of the chain actors. The effective integration of business processes, consequential capacity matching in chain functions and required or acceptable level of chain output will optimize the chain throughput and the potential value available for capture by firms participating in the chain, including 3PSPs (Robinson 2009, p. 22).

In order to deliver superior value to the chain’s customers, 3PSPs have a number of efficiency-inducing mechanisms available to them: market-based mergers, acquisitions
and alliances which effectively deliver control; formal regulation and regulatory mechanisms, and cooperative strategies, under quite specific conditions, among chain participants. Crucially, whatever strategies that are adopted will almost certainly be based on business models which will impact not only on firm behavior but also on the structure, architecture and dynamics of the chains involved (Robinson 2009, p. 22).

**Axiom 4:** Third party service provider firms in chains will tend to define strategies which seek to maximize the firm’s capacity and throughput; but variability in all processing systems, including chain systems; will set effective output, and value, limits.

All firms participating in the chain, including supplier manufacturing firms, will seek to optimize the firm’s capacity, its output and typically, its profitability. Moreover, due to the lumpiness of investment as a characteristic of infrastructure, and in some instances to a lesser degree of equipment provision, chains which operate with each of its firms operating at its maximized design capacity will be inefficient chains; the inefficiency is due to variability in processes which will, under differing but real-world situations, create both under-capacity or over-capacity at any single point in time in one or several points (or bottlenecks or choke points) in the chain (Cox et al. 2004). Accordingly, 3PSPs confront the dilemma of trade-offs involving the delivery of value to dyadic and contractual partners and ultimately to chain customers and to capturing the desired or preferred level of value (Robinson 2009, p. 23).

**Axiom 5:** Power relationships among firms in chains will distort both the ability of firms to deliver value and their ability to capture value. Further, power relationships induce disintegration rather than integration in chains and, consequentially, diminish chain efficiency. Only under carefully specified conditions may power relationships generate cooperative strategies for chain integration.

As we have previously noted the work of Cox and his colleagues at the University of Birmingham has made a significant contribution to the description, the qualitative assessment of power relationships and its codification. Cox’s view that a firm’s strategy ‘should focus on the acquisition and exploitation of supply chain and market power, and the pursuit of rents’ is a concise and insightful view of the reality of value capture in competition-driven chains.
In more recent work, Greenwald and Kahn (2005) have argued that, under quite specific market conditions in which all the major chain participants enjoy a significant level of competitive advantage, it may be possible and appropriate for firms to adopt cooperative strategies to optimize the joint benefits to be achieved through cooperation rather than competition.

### 2.9.1 Generic air freight chains and chain architecture

Beers et al. (1998, p. 296) define a *chain* as a network of connected firms aimed at the fulfillment of specific customer requirements in the first place (a well defined class of products) in conjunction with the fulfillment of needs of other stakeholders of such an entity (Figure 2.9).

![Figure 2.9. A hypothetical air freight supply chain structure.](image)

In the case of an instantiation of such consumer requirements, specific firms form a specific chain as an instantiation within a wider network of latent participating actors. The actors appearing as players in the chain are connected by precedence relationships, primarily imposed by physical dependences in manufacturing processes (Beers et al. 1998, pp. 295-296). The chain is based on the efficient coordination and cooperation amongst the various logistics service providers and the user of these services and emphasises the close links between the logistics and supply chain activities for a particular product (Bureau of Transport Economics 2001, p. 12).

It is important to remember that all end-to-end freight movements, and in this context international air freight movements, may be conceptualised as chain structures involving transactional relationships between corporate actors in logistics pathways between buyers and sellers. Further, for 3PSPs all business is transacted in chains, and though chains compete with chains to deliver the value that customer’s requires, 3PSPs compete against
their competitors to provide service within that particular chain. Effectively, in end-to-end international air freight chains the customer selects the value offered by the chain rather than that of the individual firm within the chain (Robinson 2005, p. 6).

Robinson (2008) argues that a supply chains architecture or structure consists of three discrete areas of system configuration: functional, corporate and contractual chains. In analysing the functional structure of a supply chain it is necessary to examine the dyadic patterns of logistics functions that constitute the chain. Supply chains consist of various actors each providing discrete services. For example, international air freight supply chains handling lobster shipments may consist of fishers, exporters/processors, international air freight forwarders, cargo terminal and ramp handling agents, international airlines and consignees (importer/traders).

The corporate chain includes the corporate ownership patterns of the actors participating in the chain. When conducting an analysis of the corporate structure of a supply chain it is necessary to examine a wide range of criteria, which include ownership styles (for example, privately owned, government agency, publicly listed company or a corporatized entity), the size of the various firms in terms of annual revenues, volumes, profits, staff and asset value. These metrics enable the firm’s power position to be identified vis-à-vis its dyadic partners and the other actors participating in the chain (Robinson 2008, p. 3).

The contractual chain describes the pattern of contractual linkages present in the chain. Contracts are legal instruments that explicitly specify the terms of inter-firm agreements. Contracts can vary from limited single function agreements, to highly specific and broad-based contractual agreements that cover business operational activities (Handfield and Bechtel 2002, p. 371), for example, the handling of an airlines aircraft at an airport. Contracts are often employed in supply chains so as to ‘formally rule the transactions between the supply chain actors’. Firms implementing contracts in supply chains are trying to achieve two objectives: (1) to increase the total supply chain profit so as to ensure it is closer to the profit resulting from a centralised control, that is, channel coordination and (2) to share the risks amongst the supply chain partners (Giannoccaro and Pontrandolfo 2004, p. 131). However, not all supply chain actors conduct business under contractual
arrangements. Hence, an analysis of a supply chain structure needs to identify whether the actors conduct business under formal contractual terms, or alternatively whether business is conducted under operating arrangements (Robinson 2008, p. 3).

2.9.2 Steps taken in conducting the supply chain analysis.

The analysis of the two discrete rock lobster air freight supply chains examined in the study followed the stepwise supply chain analysis framework proposed by Robinson (2009, p. 42). The framework consists of three constructs (Figure 2.10). Chain structure defines the fundamental arrangement and organization of the companies participating in chains and the factors that relate them to each other. Chain architecture and dynamics suggest that supply chains exhibit discrete morphologies; and those morphologies result from the chain actor’s business models, wealth-creating strategies of companies and other drivers of one sort or another. Chain performance and efficiency suggest issues relating to value delivery in the chain and the capture of value by the chain and by actors participating in the chain. Importantly, chain efficiency may be stable or unstable and that the chains performance over time is contingent on a range of factors that requires careful analysis (Robinson 2009, p. 40).

- **Chain structure**

Careful process mapping was used in the study to identify the sequential patterns of activities, and the firms involved in the supply chains. The process mapping examined the respective supply chains functional, corporate and contractual dimensions and linkages. In addition, the regulatory framework influencing the supply chains was examined in detail as the regulatory environment can significantly influence chain efficiency.

- **Chain architecture and dynamics**

This phase of the analysis examined the respective supply chains morphology and the various chain actors’ business models, as it is the effective implementation of the business model which underlies chain efficiency (Robinson 2009, p. 43). Critically, this analysis
examined the nature of power and the power relationships present in the chain, and their impact on the competitiveness of the various chain actors.

- **Chain performance and efficiency**

The final phase of the supply chain analysis focused on identifying the value output of the respective supply chains, and specifically, quantifying which actors deliver and capture acceptable levels of value from their participation in the chains.

2.10 The Research Problem and Hypotheses

It is clear that the air freight industry has been, and continues to be, in a period of rapid change; and service providers are faced with critical strategic issues that focus on their competitive advantage. This thesis is concerned with understanding what strategic options are available to international airlines to deliver and capture value in air freight markets and in their respective air freight supply chains in which they participate as they...
seek to extend end-to-end control to achieve greater value capture. More specifically, the study seeks to explain and define strategies for value capture and delivery for international air freight carriers so as to enable them to move from a position of weakness to a position of strength in their respective air freight chains, and thereby, deliver and capture competitive advantage.

Further, the study takes the view that although most air freight supply chains will be different in architecture, actor motives and the relationships between the actors, some firms participating in supply chains possess more power than others. Recall now that more recently Cox and others have defined the supply chain not simply as ‘…a series of functional stages’ but also ‘…as a series of exchange relationships between buyers and suppliers’ that involve patterns and degrees of power that influences the flow of value. This perspective provides an important basis for the analysis undertaken in this study.

- The global hypothesis of the study is that current air freight structures for perishable products are characterized by ‘disintegrated chains’, reflecting differing power relations in the chains.

Two sub-hypotheses have also been proposed:

- Disintegrated air freight chain relationships underlie current airline strategic options which tend to be ad-hoc in nature; and
- That disintegrated chains limit power, and therefore value capture, by airline freight carriers.

2.11 The Empirical Research Approach

The literature review demonstrated that how international airlines deliver and capture value in the air freight chains in which they participate is under-researched and therefore not only is the question of “why” and “how” being addressed in this study, but the more fundamental question is what strategic options are available to international airlines and “how” they can be employed to deliver and capture value in the international air freight
chains in which they participate. Yin (2003, p. 5) argues that case studies are the preferred research when “how” and “why” research questions are being posed, provided the focus is on “contemporary phenomenon within some real life context”. The case study can be defined as the in-depth examination of a single instance of some phenomenon of interest (Babbie 2004, p. 293).

Also, Klenke (2008, p. 60) suggested that a case study is “a detailed investigation, often with data collected over a period of time, of one or more organizations, or groups within organizations, with a view to providing an analysis of the context and processes involved in the phenomenon under study”. Zonabend (1992, p. 52) states that case study research is undertaken by giving special attention to complexities in observation, reconstruction, and analysis of the cases under study and is performed in such a way that it incorporates the views of the “actors” in the case under study.

### 2.11.1 Quality of the case study research design

Yin (2003, pp. 33-34) has outlined ways in which four logical tests for judging the quality of the research design may be applied to case study research. These four tests are: (1) construct validity, (2) internal validity, (3) external validity, and (4) reliability (Table 2.1).

<table>
<thead>
<tr>
<th>Test</th>
<th>Case Study Tactic</th>
<th>Phase of research in which tactic occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct validity</td>
<td>Use multiple sources of evidence</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td>Establish chain of evidence</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td>Have key informant review draft case study report</td>
<td>Composition</td>
</tr>
<tr>
<td>Internal validity</td>
<td>Do pattern-matching</td>
<td>Data analysis</td>
</tr>
<tr>
<td></td>
<td>Do explanation building</td>
<td>Data analysis</td>
</tr>
<tr>
<td></td>
<td>Do time-series analysis</td>
<td>Data analysis</td>
</tr>
<tr>
<td>External validity</td>
<td>Use replication logic in multiple case studies</td>
<td>Research Design</td>
</tr>
<tr>
<td>Reliability</td>
<td>Use case study protocol</td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td>Develop case study database</td>
<td>Data collection</td>
</tr>
</tbody>
</table>

Source: adapted from Yin (2003, p.34).
Careful research design, data collection and data analysis provide rigor for the case research method. In the present study, except for internal validity, the other three design tests – at all major stages of the case study from research design, data collection, data analysis to case study composition – were carried out as proposed by Yin.

- **Construct validity**

Construct validity relates to the establishment of the correct operational procedures for the concepts being studied (Yin 2003, p. 34). The first of Yin’s three tactics to enhance construct validity is to use multiple sources of evidence. The shared information from multiple sources assists with convergence on the intended construct. The more dissimilar the methods of measurement, the more irrelevant components are dissimilar and the more the shared variance reflects the construct intended (McLachlin 1997, p. 276). For this study, sources of evidence included interview data, company documents, such as company reports and presentations, and observations.

The second tactic to enhance construct validity (and reliability) is to establish and maintain a chain of evidence. During data collection, a chain of evidence was established through the initial data recording and documentation process through to the composition and writing of the case report. A chain of evidence provides the ability of the reader of a case study to follow the case study data and analysis from the initial formulation of the research hypotheses/questions to its final conclusions. All evidence that was regarded as supporting the objective of the study was analysed and catalogued.

The third tactic is to have key informants review the draft case study report. For each firm participating in this study, a completed summary was reviewed by the key informants. This allowed the informants to correct any errors of fact, and supply alternative feedback to those the researcher had made if necessary (Miles 1979, p. 597). In addition, this procedure enabled the informants to confirm that the basic facts were not misconstrued and that facts, as presented, were balanced, that is, reflected the different perspectives in the case. Often, poor case study research is that which assumes only a single perspective, and the use of informants in this review role provided a means of minimizing such bias.
(Yin 1981, p. 106). As a result of this review process, there were some minor changes made to the individual case findings, which were subsequently forwarded to the respondents for re-review and approval (Lindgreen 2003, p. 315; McLachlin 1997, p. 276).

- **Internal validity**

Internal validity is the process of establishing a causal relationship between variables (Rahim and Baksh 2003, p. 30). According to Yin (2003, p. 36), internal validity is only a concern for causal or explanatory case studies and not for descriptive or exploratory case studies. Since this research falls under the broad heading of “exploratory case study”, internal validity was not applied.

- **External validity**

External validity is the degree to which the research findings can be generalized to the broader population (Mentzer and Flint 1997, p. 211). The lack of generalizability has been the major criticism of case studies (Cavaye 1996, p. 229; Jensen and Rodgers 2001, p. 235). Nevertheless, as Yin (2003) has pointed out:

….. that “case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes. In this sense, the case study, like the experiment, does not represent a “sample”, and the investigators goal is to expand and generalize theories (i.e., analytic generalization) and not to enumerate frequencies (i.e., statistical generalizations)” (p.10)…. This is because cases are not ‘sampling units’ and should not be chosen for this reason (p.32).

Yin’s ‘analytical generalization’ implies that the primary role of a case study is to enhance understanding through the development and refinement of theory, not by providing representative profiles of a specific population. Thus, theory is the means by which case study research can be generalized (Sterns et al. 1998, p. 313). Case selection should therefore be chosen for theoretical, not statistical, reasons. The cases may be selected so as to replicate previous cases or extend emergent theory, or they may be selected to fill
theoretical niches and provide examples of polar types (Lindgreen 2001, p. 80); it should not be based on representative random samples (Eisenhardt 1989, p. 537). Thus, with case research, generalization is from each case to a broader theory (analytical generalization), not from samples to populations (statistical generalization). And, it is possible with analytical generalization to generalize from a single case, although such generalization is not automatic (Yin 2003, p. 37); the theory should be tested through replication, which enhances both construct and external validity. For this study, generalizability was enhanced by such replication (Eisenhardt 1991, p. 620; Lee 1989, p. 41).

- Reliability

Reliability is the extent to which the study’s operations can be replicated, with the same results (Page and Meyer 1999, p. 85; Riege 2003, p. 81). This means that, if a later researcher were to conduct the same study, following the same procedures, the same results should be obtained. There are two principal tactics for enhancing case study reliability.

The first tactic is to utilise a case study protocol. This study used a case study protocol which included the interview guide, details of the types of evidence that may be relevant, as well as the procedures to be followed in using the research instrument. The second tactic is to maintain a case study database. For this study, the case study database includes a copy of the completed interview guide or guides for each firm, any additional field notes recorded outside of the interview guide, and a detailed summary write-up of each case. Use of case studies involve multiple data sources, and may also include internal and external documentation together with the interviews. Hence, any printed material that was provided to the researcher by the participating firms in the study, such as copies of manuals, presentations, reports and other internal documentation were also included in the study data base (Ellram 1996, pp. 104-105; Yin 1997, p. 74).
2.11.2 The case study protocol

The case study research approach requires the formulation of a protocol for data collection which reduces the chances of missing important data by specifying the minimum amount of data collection in operational terms – for example, the types of people that must be interviewed, documents that must be analysed, or observations that need to be made – and, thus, facilitates subsequent analysis (Yin 1981, p. 105). A case study protocol is a record (normally a document) that contains the research methods, procedures and general rules that are to be followed in using the data collection instruments (Yin 1998, p. 246).

The case study protocol (Appendix 2) was utilized in the in-depth case study to ensure a consistent pathway to analyzing the interview data. It set the scope of strategic issues to be addressed and enabled the researcher to detail in advance the procedures and data requirements to be followed in the data collection stage of the study. The case study protocol was also used to enhance the study’s reliability as it acted as a guide for the researcher when conducting the case studies (Dubé and Paré 2003, p. 610).

- Objective of the Case Study Project

The objective of this study was to propose and empirically test a conceptual framework that examines how international airlines deliver and capture value, and specifically, what strategic options are available to airlines to enhance their power circumstances in the air freight chains in which they participate. The purpose of the case studies was to gather information regarding how international airlines deliver and capture value and why they select that strategic approach. As noted, the case study was based on both Victorian and Western Australian based rock lobster exporter/processors that use the international air freight mode to transport their live rock lobster products to Hong Kong, international air freight forwarders, cargo terminal and aircraft ground handling agents who handle these products, and the international airlines that carry these consignments to Hong Kong.
Field Procedures

A written consent form (Appendix 3) was obtained from each firm participating in the study prior to the case research being carried out. Individuals to be interviewed were identified as part of a priority list. A list of the potential documentary evidence was prepared. A schedule of appointments was prepared in advance so as to minimize cancellation or postponement. A brief background search of the participating companies in trade journals, on the Internet, and company annual reports was carried out to give the researcher a better understanding of each firm’s operations (Rahim and Baksh 2001, p. 33; Yin 2003, pp. 72-73).

Case Study Questions

The questions contained in the case study interview guide acted as a reminder to the researcher regarding the information that needed to be gathered – they assisted the researcher in focusing on the identified data collection requirements and keep the interviews on track. A semi-structured interview format was determined as the appropriate instrument for obtaining essential information but additional ‘probing’ questions were used as follow-up following some of the structured questions (Rahim and Baksh 2001, p. 33).

The case interview guide contained open-ended questions that enabled the informants to freely express their views (Gendall et al. 1996, p. 1; Walsham 1995, p. 78). Fundamentally, the questions invited the respondents to comment on the way in which the actors’ deliver and capture value, the factors taken into account when defining their strategic objectives so as to optimize their market opportunities and relationships with their supplier and buyers and the influence of Government regulations on their operations. In general all questions were designed for an in-depth personal interview in line with the research objectives; and were a refinement of earlier discussions and feedback obtained from the pilot study. The specification of the questions followed the recommendations of Kvale (1996, pp. 131-132), McCracken (1988, p. 34) and Woodruff and Gardial (1996, p. 5).

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5 This study was undertaken in accordance with the Griffith University Ethics Policies (Protocol AVN/04/05/HREC).
who advocate simple, general form, yet relevant questions, progressing from broadly specified to more specific questions. Questions presented in this way tend to be easier to follow and record; and often in the initial stage of the interview they assist the researcher to build rapport and informant confidence.

- **Guide for the Case Study Report**

The tentative format of the report was planned beforehand, so that information collected was tailored towards meeting the report format. Notwithstanding, the format of the report was not fixed and could be changed as and when necessary. This practice avoided unnecessary rework and site revisits. The report included single case write-ups together with a cross-case comparison. A copy of each case report was sent to those firms participating in the study (Rahim and Baksh 2003, p. 33; Yin 2003, pp. 76-77).

**2.11.3 Data collection methods**

Both qualitative and quantitative data were used in the study. Qualitative data were principally collected through face-to-face semi-structured interviews. Research of this kind lends itself to the semi-structured, open-ended type of interview to enable respondents to expand on what they consider to be significant and to frame those issues in their terms (Meredith et al. 1989, p. 313).

Each informant in the present study was interviewed using the identical interview structure (as specified by the case protocol) as a basis to ensure a degree of comparability for the output. Interviews were conducted in private and with assurance of anonymity (Kaplan and Duchon 1988, p. 577). During the field interviews the interviewee was encouraged to express his/her perceptions and experience on the variety of subjects raised and to provide concrete examples of issues where possible. The informants were also encouraged to consider topics generally, that is, not purely in relation to one situation. Interviewees were contacted again if any clarification of data was required. We also encouraged open discussions toward the end of each interview allowing interviewees to ask any questions and add any final comments. Finally, interviews were conducted for one
case at a time before proceeding to the next case study. The interviews were recorded and transcribed. This yielded a large volume of extremely rich data, that is, data that are detailed and complete enough that they provide a full and revealing picture of what is going on (Maxwell 1998, p. 94).

The key informant approached was employed in the study. Using key informants for data collection involves administering the case interview questionnaire to selected individuals within the sampled firms who have specialized knowledge about the phenomenon under study. As checks on firm and informants suitability, the case study protocol (Appendix 2) included several items addressing sample characteristics. The use of multiple informants also assisted data triangulation through the comparison of reports and other archival data and the interpretations of the various respondents.

In addition to face-to-face interviews with key informants, the present study also used a range of documents, company materials available on the Internet, and records as sources of case evidence. Documents included annual reports, corporate brochures, internal documents and press articles on the participating firms. In sum, the present study relies on data collected through semi-structured interviews, which were supplemented, ex ante and ex poste, with data from published and internal company documents, Internet web sites, and articles from trade journals (Rahim and Baksh 2003, p. 33).

2.11.4 Case study data analysis procedures

A content analysis approach was used to categorise the key statements obtained from the case informant interviews (Golicic and Mentzer 2005). The technique has been recommended for the analysis of semi-structured and open-ended questions and entails decomposing the transcript into distinct statements and using a categorization scheme to classify the content of each statement. As Singelton et al. (1993, p. 381) state ‘the basic idea is to reduce the total content of a communication to a set of categories that represent some characteristic of research interest’. This involved examining the transcripts and focusing on emerging themes, messages and meanings, fruitful lines of enquiry, or possible areas for more detailed study.
Thus, the case interview data was first transcribed verbatim and transcripts were later clarified, revised, and stored in a secure computer file. This involved examining the interview transcripts and focusing on emerging themes, messages and meanings, fruitful lines of enquiry, or possible areas for more detailed study. From the transcripts the key statements in each interview were then identified and grouped into respective categories, with those linked for each type of interview closely linked for ease of analysis (Woodruff and Gardial 1999, p. 193). The categorization of the case interview data enabled excerpts from various interview transcripts relating to a particular topic and enabled common themes and responses between interviews to be effectively identified, allowing conclusions to be drawn and common explanations to previous research findings to be identified. The categories are manifested in the case study chapter headings (Chapters 4-5); the documents and archival records were also used to provide case company background details.

2.12 Summary

This chapter has provided an extensive review of the literature relevant to how international air freight actors, in particular international airlines, can capture and deliver value, thereby achieving competitive advantage. The logistics, supply chain and transportation literature offers useful insights about the strategies necessary for international airlines to capture and deliver value in the respective international air freight chains in which they participate. It was argued that international airlines must deliver competitive advantage to their associated third party service providers involved in the end-to-end movement of international air freight. This is so because air freight only moves because it creates competitive advantage and value to the buyer, seller and 3PSPs, and it moves in physical and logistics pathways that deliver value. It was also argued that international air freight chains are characterized by the ability of some actors to have dominance over other actors in recognizable power relationships; and hence, international airlines in those chains will define strategies to enable them to move from a position of relative weakness to a position of relative strength in the chain.
In addition, as we have noted from the literature review, there has not been any rigorous attempt to define with any precision how strategies are defined nor how value is captured and delivered by airlines participating in international air freight chains, thereby enabling airlines to enhance their power position in those air freight chains in which they participate. This chapter has addressed this issue by proposing a conceptual framework that can be used to empirically test international airline freight strategies defined to capture and deliver value.

This chapter builds upon the previous chapter and has also presented and discussed the case study research methodology which was used to empirically test the study’s hypotheses. The following chapters present the case studies which were underpinned by the study’s conceptual framework and the case research methodology discussed in this chapter. Chapter’s 4 and 5 present the two in-depth cases examined in the study, whilst Chapter 6 presents and discusses the case study analysis. Chapter 7 identifies and discusses the strategic options available to airlines to capture and deliver value and answers the research hypotheses. Chapter 8, the concluding chapter, discusses the findings.
CHAPTER 3: AUSTRALIA’S INTERNATIONAL AIR FREIGHT MARKET: A BACKGROUND NOTE

3.1 Introduction

This chapter presents an overview of the air freight market and operations in order to provide a background for the more detailed case study analysis which follows. It points out that the market is segmented; and that the world air transport industry is largely a regulated industry and subject to bilateral air services agreements (ASA’s). The ASA agreements provide the broad aero-political environment under which airlines compete and as such shape the industry structure. It notes also the regulatory framework under which Australia’s international air freight industry operates; the way in which airlines configure their networks (which is important in strategic terms); the geographical extent and spatial patterns of airline networks as well as airline frequencies in those networks; and the technical characteristics of the aircraft and the ULD’s used by airlines serving the Southern and Western Australia/Hong Kong live rock lobster air freight markets.

The chapter also presents an overview of Australia’s international air freight industry highlighting the annual growth rates experienced by the industry, the key commodities exported by the air freight mode from Australia, the major international air freight markets by city pairs, the principal airlines serving Australia’s international air freight market, and the spatial and available air freight capacities of the airlines serving the Melbourne and Perth to Hong Kong air freight markets.

3.2 Air Freight – A Segmented Market

Air freight carrying airlines\(^6\) can be categorized as combination passenger/cargo airlines, dedicated all-freight operators or integrated carriers. The combination carriers carry both passengers and air freight. They transport freight in the belly-hold space on their scheduled passenger services as well as providing freighter services using freighter-only

\(^6\)See Appendix Number 1 for a more detailed overview of the various international air freight actors.
aircraft (Hellermann 2006, p. 5). A smaller number of airlines, for example, KLM and EVA Air, operate so-called ‘combi’ aircraft in which freight is carried on the aircraft’s main deck as well as in the aircraft’s lower deck belly-holds (Yan and Chen 2008, p. 176). ‘Combi’ aircraft are employed on routes where there is a strong demand for air freight while the demand for passengers may be relatively thin (Doganis 2002, p. 304).

Integrated carriers, such as FedEx or United Parcel Service (UPS), also called express air carriers, offer a variety of products to shippers and supplement air services with extensive ground transport to provide customers with time-definite delivery with continuous tracking, and, if necessary, logistics expertise to support JIT inventory strategies (OECD 1999, p. 6). For customers, the attractiveness of the express integrated carrier is the single company point of contact for the door-to-door delivery of their products to a majority of destinations within 48-72 hours, depending on the distance involved (Humphreys 2003, p. 22) and overnight delivery to most destinations around the world. In order to achieve this objective, the integrators have designed hub-and-spoke air networks to support their global operations (Lin et al. 2003, p. 255). Hence, a key attribute of the integrators is their development of, and reliance upon, a global long-haul air network that is integrated with regional short-haul air/road feeder networks, which are, in turn, integrated with local delivery networks (Gillingwater et al. 2003, p. 151).

3.3 The International Aviation Regulatory Framework

The world air transport industry has been and still is closely regulated (Carnaroli and Melloni 2001, p. 171). Hence, the regulatory environment in which international airlines operate heavily influences airline network structures, management strategies, and subsequently, airline productivities and efficiencies (Oum and Yu 1998, p. 21). It is important to briefly review the international regulatory framework in order to have a better understanding of airline competitive positions.

International air transport operates within the framework of the 1944 ‘Chicago Convention on Civil Aviation’, and is traditionally administered by a complex network of multilateral government air services agreements (ASA’s) (Butler and Keller 1998, p. 5; Marchick and Newman 2002, p. 444) and International Air Transport Association (IATA) rules. Based on
the principle that “every state has complete and exclusive sovereignty over the air space above its territory”, the convention established multilateral agreements in some areas, mainly concerning an airline’s right to overfly and make technical stops in a foreign country, but not in areas of commercial rights. Commercial air rights were left to bilateral agreements to be negotiated between individual countries (Rochat 1995, p. 59). The convention also established the International Civil Aviation Organization (ICAO), an intergovernmental agency which provides a forum for discussion of key air transport issues and the basis for global coordination of technical and operational standards and practices (Carnaroli and Melloni 2001, p. 171). The International Air Transport Association (IATA) was also formed in 1945 to represent the interests of airlines, and is involved in the technical and commercial aspects of aviation. IATA’s most important functions have been to set air fares and cargo rates and to act as a Clearing-House for settling inter-airline accounts (Bureau of Transport & Communication Economics 1994, pp. 114-117). However, since the mid-1970s, IATA’s price setting ability has diminished due to competitive pressures from charter airlines and non-IATA airlines, and the trend towards precompetitive aviation policies (Oum and Yu 1998, p. 21).

Scheduled airline services/capacity between nations is determined through a legal framework of bilateral negotiations of ASA’s (Jones and Collett 2001, p. 24). Bilateral air services agreements are negotiated on the principle of reciprocity, and equal and fair exchange of traffic rights between countries different in size and with airlines of varying sizes. Scheduled airline capacity between nations is therefore determined through bilateral negotiations of ASA’s. Bilateral ASA’s vary in form, but in general, these agreements establish a country’s market access (entitlement of capacity), airline designation, capacity (the level of flight frequencies, the authorized routings, and whether dedicated air freight services would be permitted). These agreements can also determine tariffs, the types of aircraft that can be used, and what airports can be utilized by airlines for their services (Chang and Williams 2001, pp. 207-208; Klem and Leister 1979, p. 560).

Each airline confronts a complex web of bilateral air services ratified by its home state. The existence of these agreements has greatly constrained the freedom of individual scheduled airlines, and essentially restricted competition in the international air transport
industry. Notwithstanding, the accelerating trend towards more liberal bilateral air services agreements, globalization of the industry, together with a more multilateral approach to air transportation negotiations are introducing more and more competition into the industry (Rochat 1995, p. 59).

The role of Australia’s Commonwealth Government in determining the economic regulation of Australia’s international air freight industry is limited to negotiating dedicated air freight capacity in ASA’s. The Australian Government negotiates through its bilateral ASA’s whether dedicated freight services will be permitted and/or whether a conversion mechanism that authorizes airlines to exchange passenger rights for dedicated freight services can be applied. Essentially this is the limit of the Government’s involvement in determining dedicated freight capacity. However, the Government has indirect influence on the level of capacity through the passenger capacity of ASA’s, as the majority of Australia’s international air freight is transported in the belly holds of scheduled passenger aircraft (Bureau of Transport Economics 2000, p. 145).

The Australian Government has increasingly embraced a more liberalized air policy framework. In June 1996, the Australian Government implemented a liberalized air freight arrangements policy which aimed to encourage the development of air freight as a market in its own right, rather than have it treated as a by-product of passenger services (Department of Transport and Regional Services 2000, p. 18).

In 2000, the Government released its ‘International Air Services Policy Statement’. The key areas of this policy statement included:

- The liberalization of air services arrangements;
- The liberalization of the ownership requirements of Australian airlines;
- The allocation of capacity available under Australian air services arrangements;
- Liberalizing international aviation multilaterally; and
- The development of air freight as a market in its own right, rather than have it treated as a by-product of passenger services (Department of Transport and Regional Services 2000, pp. 1-18).
In 2006, following a review of its international air services policy, the Government once again reaffirmed its commitment to developing Australia’s air freight market by seeking unlimited access for freighter aircraft from Australian markets to and beyond foreign markets (Truss 2006, p. 1). Since that announcement, the Government has negotiated ASA’s that authorize designated airlines to determine the type of aircraft, frequencies, capacity and routing according to the market demand (Bureau of Transport Economics 2000, p. 145) between Australia and thirty of its bilateral partners as at July 2008 (Department of Infrastructure, Transport, Regional Development and Local Government 2008). Thus, the Australian Government has negotiated ASA’s with its key bilateral partners so as to ensure that dedicated air freight capacity is not used in ASA’s at the expense of passenger capacity (Department of Transport and Regional Services 2000, p. 19).

3.4 **Airline Route Networks and Strategies: An Overview**

There is an extensive body of literature discussing airline route network configurations and strategies. For our purposes, however, it is useful to briefly examine the recent network configuration strategies, with a particular emphasis on the airlines operating in the Victoria and Western Australia to Hong Kong air freight markets.

Every airline is endowed with a unique route structure, traffic catchment area, cost base, productivity levels and management skills that are the result of its path and pace of historical development, strategic intent, the characteristics of its home and regional markets, and the international regulatory system (Youssef 1992). Fleet routing and flight scheduling are the two critical activities of an airlines operation. They are crucial to an airline’s profitability, its level of service, and its competitive ability (Yan and Chen 2008, p. 175). Oum et al. (1993, p. 14) have asserted that airlines that wish to achieve global

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7 Australia’s ASA’s with other nations often stipulate restrictions on the number of airline services that can be operated to Brisbane, Melbourne, Perth and Sydney Airports. Services to Australia’s other airports are often authorized on an ‘unrestricted basis’. Please see Department of Infrastructure, Transport, Regional Development and Local Government (2008) ‘Register of Available Capacity’ for the full details (including restrictions) of Australia’s current ASA agreements, as at 21 July 2010.
carrier status must pay attention to their route networks. The way the airline links various nodes (the spatial dimension) and coordinates flight schedules (the temporal dimension) defines the airline’s network. Networks exist in a variety of configurations. At the most basic level, it is a single city pair, for example, a scheduled freighter service from Melbourne to Hong Kong. They can also be complex, characterized by indirect routing and multiple city pairs. There are three important characteristics of an airline network, namely the geographical extent (that is, the number of city pairs served), the spatial pattern of the network (that is, how the airline links the city pairs) and finally the scheduled frequency on the network (that is, the temporal dimension of the airline).

3.4.1 The geographical extent (size) of an airline’s route network

Reynolds-Feighan (1994) notes that ‘the operation and profitability of an airline, whether it be passenger or a freight operator, depends crucially on the network over which its services are operated….the airline’s network represents at once its production plan and its product’ (p. 197).

The geographical size of the network can be defined at three levels: the domestic only network, the regional network and the global or intercontinental network or the actual number of nodes and links that the airline services (see, for example, Hanlon 1996, Chapter 4). In the first type, the airline’s services are based in its home country and it does not uplift any international traffic. The second type refers to those airlines that have intercontinental traffic and the third type refers to some intercontinental traffic. From an air freight context, airlines may have all types of traffic, but one would expect that an airline wishing to satisfy shippers’ global logistics requirements, would presumably be more interested in pursuing greater volumes of international traffic. This does not mean that it would de-emphasise the other types of traffic as they provide a valuable revenue source, but a global carrier would actively pursue strategies that would provide it with a substantial share in global traffic.

There are several structural economies that occur from network size, namely economies of network density, economies of link density and economies of scale and scope (Productivity
Commission 1998, pp. 26-28). Economies of network density occur from an increase in the volume of traffic served by an airline when the physical size of the network is held fixed (Holloway 1997, p. 28; Janić 2000, p. 258). Economies of link density refer to advantages of increasing traffic volume on a specific route segment of the network. Airlines may employ larger aircraft on the segments and thus reduce unit costs of operation. By adding more flights to a sector, an airline can improve service levels.

Caves et al. (1984, p. 471) have shown that economies of scale in airline networks are negligible. Network expansion per se will not lower unit costs; there are at best, constant returns to scale. Holloway (1997, p. 20) suggests that an international airlines air freight handling and automated tracking facilities can benefit from economies of scale, and information technology certainly does. Bailey and Panzar (1981, p. 126) note that there are substantial economies of scale with respect to aircraft size. Whether economies of scale are substantial or not in the international airline industry, the Bureau of Transport & Communication Economics (1994) observes that international airlines are constantly pursuing the growth strategy, to achieve a competitive advantage, hence there must be a perception held by airline executives that economies of scale exist. Indeed, perceptions are quite important in driving strategic decisions.

There are also marketing factors motivating international airlines to pursue extensive route networks. The addition of extra routes by an international airline whether through alliances or the extension of its own route network is primarily a method of satisfying shippers’ preferences for an extended network size. The value placed by shippers on a large route networks has increased as their businesses have become more global in nature which has resulted in shippers placing increased value on the extent of network services and their interest in more sophisticated services consistent with the higher logistics performance required in modern supply chains (Frampton 1997, p. 26; Heaver 2002, pp. 214-215).

3.4.2 The spatial pattern of an airline’s route network

Most airline route patterns have an affinity to one of the two basic types: linear or hub and spoke networks. These are illustrated in Figure 3.1. A linear point-to-point airline route
tends to focus its services on dense markets with sufficient origin and destination traffic to sustain non-stop operations (Dempsey and Gesell 1997b, p. 213). In international markets, however, the airline is constrained by freedoms of the air and cabotage\(^8\) restrictions as to how many stops it can make en-route.

Hubbing enables enhanced marketing opportunities via the geometric proliferation of the number of possible city-pair markets which an airline can serve (Dempsey and Gesell 1997b, p. 206). In the hub-and-spoke system, airlines develop their networks by combining features from non-stop and multi-stop routing patterns. The hub operational system is based on flights arriving from numerous points (spokes) at a hub airport where passengers, baggage and freight connect to flights departing to numerous points. So after a short turnaround period, an equally large number of turn-around departures travels out along spoke routes from the hub. The hub airport thereby acts as a gathering and consolidation point for flights operating to multiple destinations. The hub-and-spoke networking system provides many significant economic and competitive advantages for airlines. One distinction between hub-and-spoke and linear point-to-point systems is that the former tends to have more simplified flight patterns which are more focused and regularized (Reynolds-Feighan 1994, p. 198).

\(^8\) The exchange of air services rights between countries is based on the eight ‘Freedoms of the Air’. The first five freedoms were specified in the 1994 Chicago Convention and the complementary International Air Services Agreement Transit Agreement while the remainder have been subsequently articulated (Bartlik 2007, p. 3).
By using hub and spoke operational systems, airlines are able to increase traffic density on certain routes, to take advantage of economies of traffic density, and to lower unit costs (Bureau of Transport & Communication Economics 1994, p. 30). The benefits also arise on the demand side, as air freight shippers often prefer to ship their consignments with larger airlines, so an airline with an extensive hub and spoke system possesses an advantage over a new entrant and smaller airlines due to the network of points served.

Hubbing increases airlines operational efficiency (Hansen and Kanafani 1985, p. 581). Thus, hub and spoke operational systems are frequently being utilized by international airlines, particularly in the Asia Pacific region and Europe. Indeed, Rimmer (1993, p. 1014) argues that the use of large aircraft (combined with extended range smaller twin jet aircraft) will drive the international air transport industry towards hub and spoke operational systems. Countries that are centrally located between high traffic generating regions, such as Singapore and Hong Kong, have a natural advantage in developing an air transport hub (Bureau of Transport & Communication Economics 1994, p. 30). For example, Cathay Pacific Airways and Singapore Airlines have developed both passenger and air freight
hubs at their home airports. Passenger services carry air freight traffic from out stations to their hub for distribution on scheduled freighter or passenger services to the final destination. International airlines services may be constrained by bilateral ASAs as to their network structure, but where liberal agreements are in place, then airline executives will tend to adopt hub and spoke operational systems.

3.4.3 Scheduled frequency on an airlines route network

Airline networks represent both the product of the firm and also the production plan: each flight stage may be regarded as an asset of the firm, contributing the production of the flights not only on that route, but also adjoining routes, since connecting passengers and air freight consignments are ‘by-products’ in the process (Otto 2005, p. 465). An airline can increase its scale of operations by growing the scheduled frequency on its network. An airlines flight schedule is the primary factor in determining the most effective and efficient deployment of its resources (Ghobrial et al. 1992, p. 235). In international air transport, the schedule frequency (capacity) that an airline can provide on a route may be subject to bilateral limitations. There is a direct relationship between flight frequency on a route and market share. Consumers, particularly air freight shippers, prefer greater frequency of flights and an airline that offers greater frequencies can attain higher traffic levels on the route. Several studies have demonstrated the sigmoid S-curve relationship between flight frequency and market share, where greater frequencies translate to higher market share on the route (Cohas et al. 1995, p. 39).

In recent years, most international airlines have placed considerable emphasis on the number of destinations served, but in many cases due to traffic levels could only justify a limited number of services per week. While limited frequencies may be suitable for leisure travelers, such small levels of service are not considered attractive by air freight shippers who wish to transport their consignment in the quickest possible time. However, the emphasis is now changing with many airlines now moving to daily frequencies and long distance services between key hubs. Connections may also be provided by partner airlines or change-of-gauge aircraft to reach the remaining cities (Dennis 1994 p. 143). Twin engine aircraft, such as the Airbus A330 and Boeing B777-200/300 aircraft, have enabled
long haul flights on relatively thin routes. For example, Qantas Airways operates an Airbus A330-300 aircraft on its daily service from Brisbane to Singapore.

The desire by airlines to expand their route networks may be achieved through global alliances. For example, the ‘SkyTeam’ global airline alliance formed in 1999 includes cargo cooperation as a key element of the alliance (Iatrou and Alamdari 2005, p. 134). In the air freight industry what airlines call ‘global airline networks’, a group of affiliated airlines provides seamless services to shippers through coordinated flight schedules, through air waybills, computer system interfaces, joint marketing, and often joint handling services. For all practical purposes, it is similar to using a single company. Strategic alliances therefore can be viewed as a means of increasing both network size (market coverage) and enhancing network structure (optimal route configuration and connectivity).

3.5 Characteristics of the Aircraft Serving the Victoria and Western Australia to Hong Kong Air Freight Markets

It is useful, in this context, to consider the technical characteristics of the aircraft types and aircraft unit load devices – which the airlines serving the Victoria and Western Australia to Hong Kong air freight market operate.

3.5.1 Technical characteristics of aircraft serving Australia’s international air freight market

The technological beginning of the air freight industry is rooted in the circumferential design of aircraft hulls. As a by-product of the aircraft design, air freight space is created below the passenger deck where luggage, freight and mail can be carried (Dempsey and Gesell 1997a, p. 401). Most air freight travels in the belly-holds of passenger aircraft, and, traditionally, air freight has been regarded as an economy of scope by-product arising from the supply of passenger services (Doganis 1991, p. 330).
Air freight revenues are becoming increasingly important for airlines. Figure 3.2 depicts the major types of aircraft and their average cargo capacities\(^9\) operated from Victoria and Western Australia to Hong Kong.

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>ULD Configuration</th>
<th>Equipment Available for Freight</th>
<th>Volume Available for Freight</th>
<th>Maximum Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeing 747-400 Freighter</td>
<td>30M1/9LD7/2LD3</td>
<td>30M1/9LD7/2LD3</td>
<td>764.5m(^3)</td>
<td>110,000kg</td>
</tr>
<tr>
<td>Boeing 747-400</td>
<td>14LD3/6LD7</td>
<td>2LD3/6LD7</td>
<td>73.4m(^3)</td>
<td>20,000kg</td>
</tr>
<tr>
<td>Airbus A330-200</td>
<td>5LD7/16LD3</td>
<td>5LD7/6LD3 + Bulkhold</td>
<td>80.2m(^3)</td>
<td>15,000kg</td>
</tr>
<tr>
<td>Airbus A330-300</td>
<td>4LD7/14LD3</td>
<td>4LD7/6LD4 + Bulk hold</td>
<td>61.8m(^3)</td>
<td>14,100kg</td>
</tr>
</tbody>
</table>

**Figure 3.2.** Air freight capacities and ULD configuration by major aircraft types. Source: Reproduced with the permission of Qantas Freight (2010).

There are two discrete types of aircraft operated: combination passenger aircraft and dedicated freight aircraft. These modern wide-body aircraft have very good load-carrying capabilities (Radnoti 2002, p. 12). However, it is important to note that each aircraft type has a maximum range/payload capability\(^10\), and therefore, the actual air freight uplift is determined by passenger loads, fuel loads, en-route weather and the aircraft performance characteristics. An aircraft’s air freight load consists of two elements: the air freight itself and the tare weight of the unit load devices (ULDs). Tare weight is the weight of the

---

\(^9\) The recent advances in aircraft engine technology have resulted in higher performance engines that enable an aircraft to uplift more weight/payload over longer distances than has previously been possible. Consequently, air freight capacity on the majority of flights operated typically runs out of volume before it reaches maximum weight (Slager and Kapteijns 2004, p. 82).

\(^10\) See Ashford et al. (1997, Chapter 4) and Radnoti (2002) for a comprehensive overview of aircraft economics and operations.
aircraft ULD’s. The part of the load\textsuperscript{11} that the shipper (customer) pays for is termed payload. Aircraft load includes payload and tare weight of the aircraft containers. Each airline has a boarding priority for its commercial load, typically, the first priority is passengers; secondly, passenger baggage; thirdly, air mail, and finally air freight.

### 3.5.2 Description of aircraft unit-load devices used by airlines

Airlines utilize special containers designed to fit the belly-holds of their wide-body passenger aircraft, together with specially designed aircraft containers designed to fit on the main-deck of their freighter aircraft. Figure 3.3 depicts the most commonly used standard aircraft containers, commonly referred to as ‘unit load devices (ULDs)’, which can be categorized into four major groups: (1) built-up or half pallets; (2) lightweight fibreglass containers which fit onto pallets; (3) rigid containers which come in a variety of standard sizes designed to fit into aircraft holds; and (4) inter-modal type containers (Dempsey and Gesell 1997a, p. 411).

Aircraft pallets, for example, the PMC/P6P pallet (Figure 3.3), enable goods to be assembled and secured to a metal pallet by nets. Containerization is the practice of using a box device in which a number of consignments are stored, protected, and sometimes, handled as a single unit in transit (O’Connor 1995, p. 182). Containers, such as the AAF and AKE shown in Figure 3.3 are certified as an integral part of the aircraft. These ULD’s are available from an airline for use by the shipper (Dempsey and Gesell 1997a, p. 410).

Aircraft containers offer a number of advantages:

- Container loads assembled by a shipper or air freight forwarder may by-pass air cargo terminals, and can permit aircraft to aircraft transfers (provided the container type is compatible on the connecting flight) on the airport tarmac;

\textsuperscript{11} Load = payload + tare weight (1)
If tare weight is zero,
Load = payload \quad (2)
(Radnoti 2002, p. 57).
- Containerized air freight reduces packaging costs for the shipper because of the protection provided by the container;
- Containerization saves airlines time and labour in ground handling, and enables the airlines to achieve a more efficient utilization of the cubic capacity of modern aircraft; and as a result;
- Airlines can pass along part of these savings to shippers (Air Transport Association of America 1996, pp. 9-10).

**Figure 3.3.** The major types of aircraft ULD’s used by international airlines. Source: Reproduced with permission of Singapore Airlines Cargo (2004a, 2004b).

Victorian and Western Australian-based rock lobster shippers prefer to use aircraft ULD’s for their consignments due to the high shipment value and to avoid mortality due to multiple handling.
3.6 An Overview of Australia’s International Air Freight Market

3.6.1 Australia’s historical international air freight traffic growth: a brief synopsis

In 1949-50 a very small volume and proportion of Australia’s international trade were transported by air freight. In this early period, four aviation firms, British Commonwealth Airlines, Qantas Empire Airways Ltd, British Overseas Airways Corporation, and Tasman Empire Airways transported Australia’s international air freight. The primary cargo destinations were the South Pacific Islands, Hong Kong, London, Tokyo and Vancouver (Australian Bureau of Statistics 2001, p. 1038). Since these humble beginnings, Australia’s international air freight mode has become an integral part of Australia’s economy, with the sector displaying significant growth over the period 1980-2007 (Figure 3.4).

![Figure 3.4. Australia’s annual international air freight traffic: 1980-2007. Source: BITRE (2008a, pp. 1-2, 2008c, p. 27). Note: See Appendix A2 for supporting data.](image-url)
3.6.2 Australia’s air freight exports: key commodities and their importance to the Australian economy

A total of 284 361 tonnes of export cargo was exported by the air freight mode in 2007. In 2007, the total value of Australia’s exports uplifted by air freight was $AUD 31.4 billion, of which $AUD 11.3 billion were gold, non-monetary consignments (36 per cent), $ AUD 6.3 billion were goods broadly described as ‘other commodities and transactions’ (20 per cent), and $ AUD 3.2 billion was medicinal and pharmaceuticals (10.2 per cent). Exports of air freight, in 2007, as measured by weight, were overwhelmingly perishable primary products (40.5 per cent). Perishable commodities forwarded by air freight include Australian grapes, stone fruits, and sugarplums (Cooper 2000, p. 46), meat and fish/seafood products.

Figure 3.5 shows the top ten commodity groups exported from Australia by air freight in terms of value (bars) and weight (line). Figure 3.6 presents the same information by weight (bars) and value (dots). In terms of value, Australia’s air exports can be divided into four primary groups: (1) perishable food-related products; (2) gold, non-monetary; (3) manufactures and electronic equipment; and (4) medicinal products and pharmaceuticals.

![Figure 3.5](image-url)

**Figure 3.5.** Top ten commodities exported by international air freight from Australia, by value and weight-2007.
Note: See Appendix A3 for supporting data.
Several factors may explain the fact that these four groups, which in 2007 represented 87 per cent of Australia’s total air exports, constitute Australia’s primary air export commodities:

1. Except for perishable food-related products, they are high value cargoes, the transport component of their landed price being relatively small and the savings in capital, following a fast air journey, substantial (Hayuth 1983, p. 277).

2. Food-related products are physically perishable, as they only remain saleable for a limited period of time before they physically deteriorate, and therefore require speed to market to avoid spoilage and to ensure optimum product quality (Shaw 1993, p. 37). The consideration of rapid transport also applies to medicinal and pharmaceutical products, which often may have defined life-spans.

Figure 3.6 shows that while perishable products (meat/vegetables/fruit/fish and seafood products) are by far the largest commodity group by volume, they are comparatively low in value compared with some other exports such as ‘other commodities, pharmaceuticals, and electrical machinery and office machines. Of the ‘top ten’ export food groups, vegetable and fruit is of the lowest value at around $AUD 3.05 per kilogram, while fish, crustaceans and molluscs is of the highest value at around $AUD 26.54 per kilogram.

![Figure 3.6](image)

*Figure 3.6.* Top ten commodities exported by international air freight from Australia, by weight and value – 2007,


Note: See Appendix A4 for supporting data.
Australia exports both air and sea freight to destinations all around the world (Bureau of Transport Economics, 2000). Figure 3.7 shows the relative geographical significance, by major world region, of Australia’s air freight exports in 2007. Asia constituted around 23.5 per cent of Australia’s air freight export by value and around 47.5 per cent in weight terms. In terms of value, Europe was Australia’s major export air freight market (27.7 per cent). Other important export air freight markets, by value, were India (14.3 per cent) and North America (12.4 per cent). Countries located in the Pacific Region constituted the second largest grouping by weight (21.5 per cent) and were ranked fifth in terms of value (9.8 per cent).

Figure 3.7 also shows that the average unit value of exports to Europe, India and North America are significantly higher than those to Asia and the Pacific.

**Figure 3.7.** Australia’s major regional export air freight markets, by weight and value – 2007
Note: See Appendix A5 for supporting data.
3.6.3 The supply of available air freight capacity by airlines serving Australia’s international air freight market

More than 90 per cent of Australia’s international air freight is transported in the lower deck belly holds of scheduled airline passenger aircraft. The remainder of Australia’s international air freight is carried in dedicated all-cargo aircraft, operated predominantly by foreign carriers. Dedicated all-freight airlines operate overnight services to Asia, Europe and to New Zealand (Productivity Commission 1998, p. 25). The top ten airlines, as measured by enplaned freight (tonnes), accounted for 80.7 per cent of Australia’s total international air freight market in 2007. Qantas had the highest individual market share in 2007 (24.1 per cent), followed by Singapore Airlines (14.8 per cent), Emirates (8.9 per cent), Cathay Pacific Airways (8.5 per cent), Malaysia Airlines (7.9 per cent) and Air New Zealand (6.2 per cent) (Table 3.1).

The four Australian freight carriers (Qantas, Asian Express Airlines, Jetstar Airways, and Pacific Blue) carried 27.1 per cent of Australia’s international air freight in 2007. In 1997, Australian freight carriers carried 34.5 per cent of Australia’s international air freight. Qantas Airways freight market share has changed since 1986 in a similar way to its passenger market share. The freight market share of Qantas has decreased from 35 per cent in 1986 (Productivity Commission 1998, p. 265) to 24.1 per cent in 2007. Other international airlines in the top ten which experienced significant market share changes in 2007 were Malaysia Airlines and Korean Air. Malaysia Airlines market share increased from 7.0 per cent to 7.9 per cent and Thai Airways increased from 3.4 per cent to 4.2 per cent. Singapore Airlines lost freight market share, down from 15.4 per cent to 14.8 per cent.
Table 3.1. Airline share of Australia's international air freight market, 2007.

<table>
<thead>
<tr>
<th>Airline</th>
<th>Total Freight (000s tonnes)</th>
<th>Market share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qantas Airways</td>
<td>183.3</td>
<td>24.1</td>
</tr>
<tr>
<td>Singapore Airlines</td>
<td>112.9</td>
<td>14.8</td>
</tr>
<tr>
<td>Emirates</td>
<td>68.0</td>
<td>8.9</td>
</tr>
<tr>
<td>Cathay Pacific Airways</td>
<td>64.9</td>
<td>8.5</td>
</tr>
<tr>
<td>Malaysia Airlines</td>
<td>60.8</td>
<td>7.9</td>
</tr>
<tr>
<td>Air New Zealand</td>
<td>47.2</td>
<td>6.2</td>
</tr>
<tr>
<td>Thai International</td>
<td>32.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Korean Air</td>
<td>18.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Jetstar Airways¹</td>
<td>13.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Federal Express (FedEx)</td>
<td>13.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Other</td>
<td>146.2</td>
<td>19.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>761.6</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: BITRE (2008c, pp. 16-18).
Note: (1) Freight data for Jetstar Airways services to/from Singapore is not included prior to July 2007.

At the end of 2007, there were eleven airlines offering dedicated all-cargo services from Australia, primarily to destinations within Asia and connecting services beyond, and to New Zealand. Of these eleven companies, five are dedicated all-cargo airlines (Asian Express Airlines, Cargolux, FedEx, Martinair, UPS) while the remainder (Air New Zealand, Cathay Pacific, Korean Air, Malaysia Airlines, Qantas and Singapore Airlines) are passenger airlines that also operate dedicated freighter services. Sydney and Melbourne are the two major airports served by dedicated all-cargo carriers, with only a small number of scheduled freighter services being operated from Adelaide, Brisbane and Perth. ‘The routing choice of airlines depends on the type of operation and service that the airline attempts to provide’ (Bureau of Transport Economics 2000, p. 144).

Airlines complementing their passenger services with scheduled freighter services (Cathay Pacific, Korean Air, Malaysia Airlines, Qantas and Singapore Airlines) typically provide direct country-to-country services. Dedicated freight airlines, such as Cargolux provide multiple country stops throughout Asia and the Middle East en route to their home country.
FedEx operates services direct from Sydney to its Asian/Pacific hub at Subic Bay in the Philippines. Whilst, Air New Zealand operates a twice weekly Boeing B747-400 freighter service operating over an Auckland/Melbourne/Shanghai, Frankfurt/Chicago/Auckland routing (Putzger 2005, p. 16). The routings selected by the airlines vary; however, most airlines incorporate several stops en-route to Australia, including stops in the Asia Region (Bangkok or Singapore, for example), for European origin services (Bureau of Transport Economics 2000, p. 144).

3.6.4 The spatial configuration and capacity of airline services from Melbourne to Hong Kong

Victorian-based southern rock lobster exporters to Hong Kong have two transport options when shipping their products—air freight or ocean freight transportation. As live southern rock lobsters are highly perishable, Victorian exporters have utilized the air freight mode extensively so as to ensure that their product arrives in Hong Kong in the minimum possible elapsed time and in the best possible condition. Two international airlines\textsuperscript{12} operate direct services from Melbourne, Victoria to Hong Kong, whilst five Asian based airlines offer a transshipment service via their home base hubs to Hong Kong (Figure 3.8). The necessity to trans-ship consignments via an Asian hub increases the overall journey elapsed time and also the risk that the consignment may be offloaded from the connecting flight to Hong Kong. Hence, the southern rock lobster exporters have displayed a strong preference for the direct air services from Melbourne to Hong Kong. Figure 3.8 depicts the various choices of airline services that live southern rock lobster shippers have to select from when exporting their consignments to Hong Kong.

\textsuperscript{12} Qantas, Australia’s national flag carrier, also operates direct services from Brisbane and Sydney to Hong Kong. Hong Kong destined cargo that originates in Melbourne is uplifted on Qantas domestic Australian services to both Brisbane and Sydney to connect with the airline’s international services to Hong Kong.
Table 3.2 illustrates the number of airline services offered per week from Melbourne, together with the total average cargo capacity offered by these airlines. The table also shows that in addition to their scheduled passenger services operated to and from Melbourne, several airlines also operate Boeing B747 freighter services (Malaysia Airlines and Singapore Airlines) from Melbourne to their home base. These freighter services also provider shippers with additional connections from both Malaysia Airlines and Singapore Airlines hubs of Kuala Lumpur and Singapore to Hong Kong.
Table 3.2  Weekly wide-body airline services ex Melbourne to or with connections to Hong Kong

<table>
<thead>
<tr>
<th>Airline</th>
<th>Number of weekly services</th>
<th>Aircraft Type</th>
<th>Transhipment City</th>
<th>Average weekly cargo capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathay Pacific</td>
<td>23</td>
<td>A330/B747F</td>
<td>Direct</td>
<td>545</td>
</tr>
<tr>
<td>Qantas</td>
<td>14</td>
<td>A330/B747</td>
<td>Direct</td>
<td>245</td>
</tr>
<tr>
<td>China Eastern</td>
<td>6</td>
<td>A340</td>
<td>Shanghai</td>
<td>90</td>
</tr>
<tr>
<td>China Southern</td>
<td>2</td>
<td>B777</td>
<td>Guangzhou</td>
<td>20</td>
</tr>
<tr>
<td>Garuda Indonesia</td>
<td>4</td>
<td>A330</td>
<td>Denpasar</td>
<td>60</td>
</tr>
<tr>
<td>Korean Air</td>
<td>3</td>
<td>A330</td>
<td>Seoul</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kuala Lumpur</td>
<td></td>
</tr>
<tr>
<td>Malaysia Airlines</td>
<td>16</td>
<td>B777/B747F</td>
<td></td>
<td>344</td>
</tr>
<tr>
<td>Phillipines Airlines</td>
<td>3</td>
<td>A330</td>
<td>Manila</td>
<td>45</td>
</tr>
<tr>
<td>Singapore Airlines</td>
<td>25</td>
<td>B777/B747F</td>
<td>Singapore</td>
<td>876</td>
</tr>
<tr>
<td>Thai International</td>
<td>14</td>
<td>B777</td>
<td>Bangkok</td>
<td>252</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>110</strong></td>
<td></td>
<td></td>
<td><strong>2,498</strong></td>
</tr>
</tbody>
</table>

Source: Melbourne Airport and airline schedules/internet sites.

Note:
1. Services operating to/from Melbourne in March 2008.
2. Average capacity determined from aircraft manufacturer and airline internet sites.

3.6.5 The spatial configuration and capacity of airline services from Perth to Hong Kong

Western Australian-based western rock lobster exporters to Hong Kong have two transport options – air freight their consignments from Perth Airport or ocean freight transportation. As western rock lobsters are highly perishable, Western Australia based exporters have utilized the air freight mode extensively so as to ensure that their live product arrives in Hong Kong in the minimum possible elapsed time and in the best possible condition.

Cathay Pacific Airways and Qantas operate direct services from Perth, Western Australia to Hong Kong, whilst four Asian based airlines offer a transshipment service via their home base hubs to Hong Kong. Figure 3.9 depicts the various choices of airline services that live western rock lobster shippers have to select from when exporting their consignments to Hong Kong.
Figure 3.9. The airline route options from Perth to Hong Kong.

The necessity to trans-ship consignments via an Asian hub increases the overall journey elapsed time and also the risk that the consignment may be offloaded from the connecting flight to Hong Kong. Hence, the western rock lobster exporters have displayed a strong preference for the direct air services from Perth to Hong Kong. The key factor for western rock lobster exporters when selecting a flight to Hong Kong is the flights arrival time into Hong Kong. Notwithstanding, western rock lobster exporters prefer flights that arrive in Hong Kong in the late afternoon or early evening as these flight arrival times enable the consignee to customs clear the consignments the same evening for subsequent distribution.

Table 3.3 illustrates the number of airline services offered per week from Perth, together with the total average cargo capacity offered by these airlines.
Table 3.3 Weekly wide-body airline services ex Perth to or with connections to Hong Kong.

<table>
<thead>
<tr>
<th>Airline</th>
<th>Number of weekly services</th>
<th>Aircraft Type</th>
<th>Transhipment City</th>
<th>Average weekly cargo capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathay Pacific</td>
<td>5</td>
<td>A330-300</td>
<td>Direct</td>
<td>45,000</td>
</tr>
<tr>
<td>Qantas</td>
<td>3</td>
<td>A330-300</td>
<td>Direct</td>
<td>45,000</td>
</tr>
<tr>
<td>Malaysia Airlines</td>
<td>9</td>
<td>7 X B777-200/ 2 X A330-300</td>
<td>Kuala Lumpur</td>
<td>108,000</td>
</tr>
<tr>
<td>Royal Brunei</td>
<td>4</td>
<td>B767-300</td>
<td>Brunei</td>
<td>68,000</td>
</tr>
<tr>
<td>Singapore Airlines</td>
<td>21</td>
<td>B777-300</td>
<td>Singapore</td>
<td>315,000</td>
</tr>
<tr>
<td>Thai International</td>
<td>5</td>
<td>B777-300</td>
<td>Bangkok</td>
<td>85,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td></td>
<td></td>
<td><strong>666,000</strong></td>
</tr>
</tbody>
</table>

Source: Perth Airport, published airline schedules or airline internet sites.

Note:
1. Services operating to/from Perth in March 2008.
2. Average capacity determined from aircraft manufacturer and airline internet sites.

3.7 Summary

This chapter has presented an overview of the characteristics and structure of the international air freight market. The chapter discussed the unique characteristics of the international air freight mode and highlighted the important influence of the international regulatory environment on airline air freight operations. The circumferential design of aircraft hulls has created substantial air freight capacity, which airlines optimize through payload maximization and the containerization of cargo loads. The technologically advanced aircraft operated by airlines today provide significant cargo space and payload for air freight customers. These aircraft are operated in networks which vary in type from simple linear routes to more complex hub and spoke network structures. Hubbing has become a key airline strategy and enables airlines to source traffic from the various outlying markets for carriage to their hub for consolidation on further services from the hub to the destination airport. In recent years, the volume of cargo carried in dedicated freighter services has grown substantially. A unique feature of freighter operations is that airlines route their aircraft over different networks in order to optimize air freight yields and
satisfy the key market demand. The chapter concluded with an overview of Australia’s international air freight market. The international air freight mode plays a significant role in the Australian economy, with the total value of cargoes carried by the air freight mode, being around $AUD 87 billion per annum. The available airline route options available for both Victoria and Western Australia rock lobster exporters to Hong Kong were presented. Both state’s rock lobster exporters have a choice of direct or indirect, that is, services operating via a home base hub airport, to transport their rock lobster consignments to Hong Kong. Importantly, the types of air freight traffic vary considerably, with perishable cargoes being the largest export commodity, in weight terms.

Detailed case studies follow in Chapters 4 and 5.
CHAPTER 4: STRATEGIC POSITIONING AND VALUE CAPTURE:
SINGAPORE AIRLINES CARGO AND THE PERTH TO HONG KONG ROCK
LOBSTER FREIGHT MARKET.

4.1 Introduction

The western rock lobster\textsuperscript{13} is Australia's largest and most valuable single fishery accounting for around 54 per cent of Australia's annual rock lobster production and 56 per cent of seafood exports in 2007/08 (ABARE 2009, p. 46). In 2007/08, rock lobster exports represented 85 per cent of Western Australia's annual seafood exports. Hong Kong is the largest single export market for the fishery. In order to optimize the salability of their products, rock lobster exporters utilize air freight services as their preferred transport mode when shipping consignments to Hong Kong.

This chapter presents the first case study, which maps and analyses the supply and air freight value chain for the Perth to Hong Kong rock lobster chain and examines the strategies employed by Singapore Airlines Cargo (hereafter SIA Cargo) to serve this important air freight market. The chapter is structured as follows: Section 4.2 maps the supply chain from a functional, corporate, contractual, and regulatory perspective. Section 4.3 maps the corresponding value chain and analyses the chain margins/revenues and the value capture and competitive dynamics of exchange present between the actors participating in the chain. Section 4.4 examines the strategies employed by SIA Cargo to serve the Perth to Hong Kong rock lobster air freight market; Section 4.5 examines SIA Cargo value appropriation outcomes in the chain’s buyer and supplier exchange; Section 4.6 examines the alignment of the SIA Cargo’s buyer and supplier relationships in the chain. Section 4.7 presents the case summary.

4.1.1 Characteristics of the air freight market

An average of 11,000 tonnes of western rock lobsters are harvested each year (Western Australia Fishing Industry Council 2007b, p.1). In 2008, just four of the fifteen licensed

\textsuperscript{13} In this case study lobster refers to the western rock lobster.
processors were operating in Western Australia. The States licensed processors purchase about 99 per cent of the fishery’s annual catch, with the balance sold directly by fishers to the public or restaurants and so forth. In 2007/2008, West Australia exported 6,060 tonnes of lobster valued at $AUD 227.4 million.

The most lucrative market for the fishery is Hong Kong (Figure 4.1), with a value over 71.1 per cent that of exports to Japan in 2006 (ABARE 2007b, p. 1). In 2006, sixty per cent of the State’s annual rock lobster exports were exported to Hong Kong.

![Figure 4.1. Western Australia’s fresh, live or frozen western rock lobster exports by major export markets: 1998-2006. Source: Australian Bureau of Agricultural and Resource Economics (2007b, p. 1). Note: See Appendix A6 for supporting data.](image-url)

However, a number of important economic and regulatory variables have impacted the demand and supply sides of the Western Australia rock lobster industry over the last decade. A key factor on the demand side has been the growth in lobster imports by Hong Kong. Between 1998 and 2006, the annual growth rate in Western Australia’s lobster exports to Hong Kong averaged around 16.1 per cent. The strong growth in exports of lobsters is due to several factors: Hong Kong has a very high per capita consumption of seafood and a strong preference for fresh seafood; due to increased economic prosperity Hong Kong consumers are more readily able to afford more expensive gourmet delicacies, such as rock lobster; and Hong Kong is a major entrepôt gateway to China.
Notwithstanding, a related demand-side factor has been the pressure from end-customers for rock lobsters to be consistently reduced in real price terms. This pressure has been driven by a number of significant changes on the supply side of the industry. Firstly, Western Australia rock lobster exporters are now confronting strong competition from such countries, as South Africa, Cuba, and, more recently, Vietnam, who often sell their products into the Hong Kong seafood market at lower prices. Secondly, the pressure on margins has resulted in significant concentration of Western Australia’s rock lobster processing sector. Presently, there are only four licensed processors operating in Western Australia; despite, the small number, the sector is extremely competitive.

In 2000\textsuperscript{14}, the western rock lobster fishery became the first fishery in the world to be awarded Marine Stewardship Council (MSC) status as a well managed and sustainable fishery and earned the right to market western rock lobster products globally under the MSC eco label (brand) (Western Rock Lobster Development Association 2007b, p. 1).

### 4.1.2 Who captures the value?

In effect, lobsters are both a relatively scarce product and a high-end consumer product, and are therefore high priced, premium products when sold in overseas export markets, especially in Hong Kong. Importantly, there is often a very large difference between the ‘beach price’ in Perth and the ‘market price’ in Hong Kong. Despite the small number of rock lobster processors, there is strong competition between the processors to secure product (Shoebridge 2004). The Hong Kong seafood is also very competitive, which places considerable pressure on the Western Australia-based exporters to provide highly competitive landed prices for their products in Hong Kong.

A key question for those airlines participating in the Western Australia to Hong Kong lobster air freight market strategy definition is to identify who captures the value and identify the strategic options necessary to enhance their value capture. Surprisingly, as

\textsuperscript{14} The Western Rock Lobster Fishery was recertified by the MSC in December 2006 as sustainable and well managed, and is eligible to continue to marketing and tagging its catch with the internationally recognizable blue MSC eco-label (Western Australia Fishing Industry Council 2007a, p. 5).
we will note, the Perth-based actors, particularly the exporter/processor, only capture relative small levels of value.

As the case study evidence reveals, the dominant actor in the chain is the importer/trader based in Hong Kong who is able to charge a premium price for the lobsters in the local Hong Kong and Southern China markets, whilst at the same time leveraging its position as a buyer to receive ‘competitive’ landed prices for the rock lobsters in Hong Kong. In the analysis that follows it can be seen that the SIA Cargo margin from the transportation of rock lobsters is quite small at around 5 per cent. SIA Cargo strategy is to focus on the provision of a highly reliable and efficient airport-to-airport service, supported by state-of-the-art computer systems and high levels of customer service. A unique feature of the Perth air freight market is that the available air freight capacity for most of the year greatly exceeds market demand. This has resulted in airlines principally competing on the basis of price. During periods of high demand for air freight space, such as the Chinese New Year holidays, airlines are able to charge premium prices due to the capacity constraints. Moreover, the case analysis shows that the air freight handling and aircraft ramp handling services are highly commoditised with only very little service differentiation.

4.2 Mapping the Supply Chain

4.2.1 The functional structure of the chain

What is the set of logistics activities which compromises the export rock lobster air freight chain? Figure 4.2 indicates the pattern of functional relationships present in the chain. It reflects the notion of a transactional, buy/sell supply chain as suggested by Cox et al. (2002, 2004) in classic supply chains and as applied to freight chains more generally by Robinson (2006, 2007a, 2009). Particularly, it underlines the sequential pattern of dyadic linkages in the chain and suggests that it is the chain, not any single firm in the chain, which delivers value to the end-customer; and that the revenues derived by the individual firms in the chains are some proportion of the total sales revenue (Robinson 2007b, p. 95). Clearly, given the perishable nature of the freight, time is a key dynamic in chain operations.
The export chain, in this context, is conceptualised as a set of key activities by which western rock lobsters are supplied as air freight into the buyers and consumers in a range of market segments oriented in and around Hong Kong.

**Western rock lobster fishers:** The *western rock lobster fishers’* role is to harvest and collect rock lobsters in accordance with their approved individual transferable effort (ITE) quota. Typically, the rock lobster fishers leave port very early in the morning and return to port in the afternoon (Monday-to-Saturday). The onboard routine involves the fishers retrieving pots, removing the catch, re-baiting the pots and setting them again (W.A. Primary Industries Training Council 2007).

The case study exporter/processor sources eighty per cent of their rock lobsters from independent fishers with the balance caught from their own vessels. The fishers deliver their catch live to the western rock processor, in two ways. Perth based fishers deliver their catch to the processors facility located at the Fremantle Boat harbor. The non-Perth based fishers deliver their catches, in sealed bins, to the processor’s truck driver at their local ports, who subsequently transports the catch to the exporter’s processing facility.

**Western rock lobster processing:** Western rock lobster sales activities are conducted by four Western Australia-based rock lobster processors. These companies purchase the rock lobster fishers harvest, or alternatively, use their own vessels/staff to harvest western rock lobsters. The processors market their products under their own brand on a global scale. In Western Australia, the processors also own their processing facilities and thus are the major actor on the production side.

The primary functions of the *western rock lobster exporter/processor* include collecting the lobsters from the licensed western rock lobster fisher(s), grading, preparing and packaging the rock lobster ready for export, deliver the rock lobster consignments to their international freight forwarder ready for carriage, receive and process orders from their overseas customers, but, particularly their Hong Kong based importers/traders, and conduct overseas marketing visits to their major export markets, particularly Hong Kong and China to promote their products. Upon delivery of the lobster catches, the
processor’s staff sorts the lobsters by size and places them in special holding tanks. The processor liaises on a daily basis with their ten Hong Kong and China-based clients, and upon receipt of an order, they source the appropriate graded lobsters from their holding tanks and place them in polystyrene boxes, which are topped with saw-dust and a frozen gel pack so as to minimize movement thereby reducing potential mortality, and then they subsequently arrange delivery of the consignment to their international air freight forwarder.

**International air freight forwarding:** The air freight forwarder takes delivery of the lobster consignment(s) from the exporter/processor. The key activity undertaken at this part of the chain is the processing and handling of the shipment in accordance with SIA Cargo and governmental regulatory requirements in preparation for the air freight transportation to the consignee in Hong Kong. In order to optimize the salability of the lobsters, the exporter/processor delivers the consignment to the freight forwarders premises around 3 hours prior to the SIA flight cut-off time. The international air freight forwarder provides interim storage for the consignment whilst the handling, airway bill preparation, and the Australian Customs Service and Australian Quarantine and Inspection Service (AQIS) approval formalities are completed. The rock lobster cartons are loaded into a Singapore Airlines unit load device (ULD) for the flight from Perth to Hong Kong, and are then transported by the international air freight forwarders truck to SIA Cargo’s contracted cargo terminal operator at Perth Airport. The international air freight forwarder therefore acts as the intermediary between their customer, the exporter/processor and SIA Cargo. Importantly, the freight cost from Perth to Hong Kong for western rock lobster shipments is usually agreed at the start of the season with SIA Cargo.

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15 The company’s western rock lobsters are graded from Size A to Size H, based on the individual lobster weights. Overseas markets particular preferences for different size lobsters, hence, the weight grading scale.
Figure 4.2. Key activities in the live western rock lobster air freight chain from Perth to Hong Kong.
**Cargo terminal operations:** Singapore Airlines/SIA Cargo air freight and aircraft handling operations in Perth are handled by two specialist organizations. The cargo terminal operator (CTO) is contracted by SIA Cargo to handle its import and export air freight at Perth Airport. The first function that the CTO performs is the acceptance of the consignment from the international air freight forwarder on behalf of their client airlines. At the time of freight tender the CTO check-weighs the shipment and examines the associated shipment documentation to ensure that it is all in order.

Once the CTO is satisfied that the shipment is in order a security examination is conducted in accordance with Australian Government Department of Transport and Regional Service (DOTARS) air cargo security regulations. When the security clearance is obtained for the cargo the shipment is manifested on the SIA flight’s cargo manifest and the details are reported electronically to the Australian Customs Service (ACS). The ACS ensures that the approval to export is in order and once they are satisfied the details are correct they transmit a clearance to export to the CTO – this approval is required before the consignment can depart from Australia. Finally, once the ACS approvals are received and all of the freight is loaded as booked in accordance with the SIA Cargo’s requirements, the CTO advises the ULD weights and identification numbers to the next party in the chain, the ramp handling agent.

The SIA flight cargo cut-off time for the acceptance of shipper-loaded ULD’s is two hours prior to the flight’s scheduled departure time. The CTO provides interim storage for the lobster consignments following the cargo acceptance and prior to the ULD’s being transferred to the ramp area for loading onto the Singapore Airlines flight.

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16 Ground handling company employees are responsible for the operations performed during the time an airline’s aircraft spends on the ground between flights. In short, when an aircraft arrives at the airport ramp area, it is typically parked at a gate and connected to ground power units and aerobridges, various types of cargo are unloaded and loaded, fuel and water are tanked, and toilet services are provided. On departure, the aircraft is pushed back from airport terminal gate area and the engines are started through communication between the pilot and the ramp operator (Ek & Akselsson 2007, p. 60).
The CTO is also responsible for the storage and monitoring of SIA Cargo’s containers (ULDs) and the disassembly and processing of SIA Cargo’s import air freight at Perth Airport.

**On-site airport handling:** The *ramp handling agent* is contracted by Singapore Airlines to handle the aircraft loading and unloading, load control and passenger check-in services for Singapore Airlines at Perth Airport. The ramp handling agent is responsible for collecting the cargo from the CTO for loading onto the assigned Singapore Airlines flight. The ramp handling agent is also responsible for the aircraft weight and balance function (ensuring that aircraft is properly trimmed in accordance with the aircraft’s technical limitations); presenting the flight plan and NOTOC\(^{17}\) to the Captain, and loading all the baggage and air freight onto the aircraft.

The ramp handling agent normally commences the loading of the outbound aircraft from Perth around 1.5 hours prior to the scheduled time of departure (STD). Depending upon the number of aircraft containers (ULDs) to be loaded, this process can take around 45-60 minutes to complete. On average, there are around 6-10 staff assigned to the handling of the aircraft. The ramp supervisor is responsible for ensuring that the aircraft is loaded correctly – this includes passenger baggage, air freight and mail.

**Singapore Airlines Cargo:** SIA Cargo performs both marketing and operational functions. Under DOTARS air cargo security regulations an airline operating services from Australia can only accept air freight consignments from an approved ‘Regulated Air Cargo Agent’ (RACA). Australia’s regulated air cargo agents are primarily International Air Transport Association (IATA) accredited international air freight forwarders. SIA Cargo therefore issues a tariff to the international air freight forwarders who act as the intermediary between the airline and the air freight shippers using their services. In order to attract new or additional business, airlines may also conduct marketing campaigns to promote overseas destinations for exporters. SIA Cargo operational functions in Perth include allocating air freight space on a nominated flight to the freight forwarder for the carriage of the freight; preparing a loading and booking sheet for each

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\(^{17}\) NOTOC is the acronym used for the ‘Notice to Captain’.
flight for use by the CTO, uploading the flight shipment data into the SIA Cargo computer system, and billing the international air freight forwarder for the carriage of the cargo.

The final part of the supply chain activities occurs in Hong Kong. Hence, following all the air freight transport activities, the physical flow in Hong Kong is highly dependent on the local distribution channels for the rock lobster consignments to reach the markets.

**Aircraft ramp handling:** This segment commences with the aircraft ramp handling at Hong Kong International Airport. After the unloading of all of the cargo from the aircraft, the ramp handling agent provides the ground transportation from the apron area to Singapore Airlines/SIA Cargo’s contracted CTO, where the Hong Kong import formalities are conducted.

**Cargo terminal operations:** Once the ramp handling agent has transferred the cargo to the CTO then the ULD’s are unloaded by the CTO staff into cages for loading onto the importer/trader trucks following customs clearance of the rock lobster air freight consignment(s). The CTO completes the necessary Hong Kong Customs formalities, notifies the various consignees of their freight arrival, and delivers the shipment to the consignee once the necessary Hong Kong customs formalities have been completed. The CTO’s service standard for handling perishable air freight consignments is to have all perishable consignments available for customs/clearance and collection two hours after the actual arrival of the flight in Hong Kong.

**Importer/trader:** The customs clearance of the western rock lobster consignment marks the first physical activity of the Hong Kong-based importer/trader. The importer/trader subsequently takes delivery of the consignment and stores the lobsters in special holding tanks at their warehouse (typically overnight). The importer/trader also markets/distributes the product in Hong Kong or arranges for the re-export of the lobsters to China. The importer/trader also takes orders for western rock lobsters from restaurants based in Hong Kong and Southern China. Thus, the main activities

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18 See Fitzgerald (2005) for a detailed analysis of Hong Kong’s seafood distribution system; and Chung (2007) and Goldman et al. (1999) for a comprehensive overview of Hong Kong’s food retail system.
performed by the importer/trader are product warehousing, transportation, inventory
control, and the marketing and promotion of seafood products.

4.2.2 Corporate ownership in the chain

Is the chain a chain for big players? Are chain markets competitive markets? Are there
high levels of corporate integration or interdependence in the chain? Chain efficiency
and chain dynamics reflect ownership and size and market dominance and in is this
section we detail aspects of ownership that may be of interest in understanding chain
value. Figure 4.3 depicts the corporate chain structure and identifies the ownership basis
for each chain actor together with their primary business activities.

- The lobster processing market

The chain is driven by seasonal orders for western rock lobsters placed by
importers/traders based in Hong Kong. The rock lobster exporter/processor is a 100 per
cent Western Australian owned and operated family business. Based at the Fremantle
Fishing Boat Harbour, the company commenced business in 1993. The company is
European Union and United States Food and Drug Administration accredited, and also
operates a quality assurance program endorsed by the Australian Quarantine and
Inspection Service. The company also holds a Registered Export Establishment licence
from the Australian Government. The company is one of the four remaining Western
Australia western rock lobster processors, despite the small numbers of processors; the
company confronts extremely strong competition. The company employs around 50
staff.

The company’s primary business activities include the catching and processing of
western rock lobsters, fresh Broadbill Swordfish (*Xiphias gladius*), Bigeye Tuna
(*Thunnus obesus*) and Yellowfin Tuna (*Thunnus albacares*) and the marketing of these
products in key export markets. The company processing facilities include a state of the
art export registered dockside processing and packing centre. The company also
operates a fleet of its own modern vessels, which are used in both its western rock
lobster and long line fishing operations. The company also has strong relationships with
a number of independent rock lobster fishers, located along the Western Australia coastline, to supply rock lobsters for processing and export to key overseas markets.

The company’s major western rock lobster export markets are Hong Kong, China, United States of America, Japan/Taiwan and the Australian domestic market. The company also exports smaller volumes to Europe, Malaysia and Singapore. However, Hong Kong is the company’s major export market accounting for around 50 per cent of the company’s exports in 2007. Hong Kong acts as the gateway to China with around 85 per cent of the lobster consignments being re-exported to Southern China\(^\text{19}\) by the company’s Hong Kong-based importer/trader clients.

Importantly, the firm’s facilities are designed to cater to the peak demand during the peak lobster production period from December to March (Department of Fisheries, Western Australia 2005a, p. 16). Consequently, the peak demand pressures do not require additional facility investments for the processor apart from the general pressure to increase efficiency.

The company is capable of handling all types of perishable consignments, such as seafood, meat, dairy products and produce lines. The company’s facilities ensure cool-chain management and product integrity are carefully maintained. The company’s operations are located in the air freight precinct at Perth Airport and they have access to a 3,800 square metre warehouse area which includes cool-room/cold store facilities and a temperature controlled container loading area. The warehouse is both Australian Customs Service and Australian Quarantine Inspection Service (AQIS) approved, with an inspection area for export and import cargoes.

\(^{19}\) See Tang (2007) for an overview of China’s seafood market and distribution system.
<table>
<thead>
<tr>
<th>Chain Actor</th>
<th>Rock Lobster Fishers</th>
<th>Exporter/Processor</th>
<th>Freight Forwarder</th>
<th>CTO</th>
<th>Ramp Handling Agent</th>
<th>Airline</th>
<th>Ramp Handling Agent</th>
<th>CTO</th>
<th>Importer/Trader</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership Structure</td>
<td>100% owned private family company</td>
<td>100% owned private family company</td>
<td>Private Australian owned company</td>
<td>Public Company listed on the Australian Stock Exchange (ASX)</td>
<td>Fully owned by an ASX listed company and a major global airline</td>
<td>Publicly listed company</td>
<td>Private Hong Kong Listed Company</td>
<td>Private Hong Kong Listed Company</td>
<td>Privately owned Hong Kong based company</td>
<td>Privately owned Hong Kong based restaurants</td>
</tr>
<tr>
<td>Primary Business Activities</td>
<td>Harvest rock lobsters in accordance with approved individual transferable quota (ITE)</td>
<td>Process lobster for export and domestic sales; market rock lobster and premium Australian fish</td>
<td>Provision of export and import air and ocean freight handling services</td>
<td>Provision of air freight handling services for client airlines</td>
<td>Provision of aircraft and passenger handling services</td>
<td>Provision of aircraft and air cargo services</td>
<td>Provision of air freight handling services for client airlines</td>
<td>The sale of rock lobsters to wholesalers and restaurants in Hong Kong and Southern China</td>
<td>Use of rock lobsters in restaurant dishes</td>
<td></td>
</tr>
<tr>
<td>Number of market players</td>
<td>596(^1)</td>
<td>4</td>
<td>5(^4)</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td>15(^2)</td>
<td>110004</td>
</tr>
</tbody>
</table>

Figure 4.3. The western rock lobster corporate chain structure.

Notes:
1. There are 596 licensed vessels authorized to harvest lobsters in the WA Rock lobster fishery; the specific number of fishers is not available in the public domain.
2. There are around 50 air freight forwarders participating in the WA air freight market, out of which five specialize in the handling of perishable air freight cargoes, such as rock lobsters.
3. Informant A estimate.
4. Hong Kong Tourism Board (2010) notes that there are 11000 restaurants in Hong Kong (the number of seafood restaurants is not available).
SIA Cargo air freight operations are handled by one of the two air cargo terminal operators (CTO) located at Perth Airport. The CTO provides air freight handling services for seven international airlines and holds around 70 per cent of the market. The company is a division of a major global airline that has been in business for over seventy years with total assets valued at $AUD 20 billion as at the end of the June 2009 financial year. The company’s net profit during the 2009 financial year was $AUD 123 million on an annual turnover of $AUD 14.5 billion.

The firm is publicly listed company on the Australian Stock Exchange, with the major shareholder, a subsidiary of a major global bank, holding around 20 per cent of the shares as at 31 December 2007. The second largest shareholder is a major Australian bank with a 16 per cent shareholding. The third and fourth largest shareholders are two global banks with shareholdings of 15.8 and 9 per cent, respectively. There are a further sixteen major shareholders, consisting of banks, insurance companies, and investment companies, that hold a 21 per cent shareholding in Company C, with the balance of the shares held by smaller investors. The issued and paid up capital as at 30 June 2009 was $AUD 5.7 billion.

The CTO, when providing international air freight handling services, earns its revenue from two discrete streams. The company’s contracted airlines pay air freight handling fees, either on a loose per kilogram basis, or on a fixed rate per aircraft turnaround. The second revenue stream comes from handling charges such as import cargo deconsolidation fees, storage charges, dangerous goods handling and checks and documentation handling fees; these charges are paid by the in international air freight forwarder on behalf of the shipper, and by consignees, in the case of import cargo consignments.

The CTO operates a modern and fully mechanized 4,500 square metre terminal at Perth Airport. The facility operates 24 hours per day and includes an elevated transfer vehicle (ETV) handling system, multi-level Unit Load Device container and storage system, cool room and freezer facilities, vehicle by-pass lanes, and cargo break-down and build-up areas. The warehouse is both Australian Customs Service and Australian Quarantine
Inspection Service (AQIS) approved, with an inspection area for export and imports air freight consignments.

- **Ramp handling agent (Perth)**

Singapore Airlines ramp handling agent at Perth Airport commenced business in 2001 and is one of the two authorized ramp handling agents operating at Perth Airport. In July 2007, the company was acquired by a joint venture company between a major Australian based transport and logistics group, which is listed on the Australian Stock Exchange, and a Middle East-based international airline group. In 2007, the firm’s Australian based parent company’s annual revenue was $AUD 7.5 billion, with a net profit of $AUD 408 million. The Middle East based owner annual revenue in 2007/08 was around $USD 11.2 billion, with a net profit of $USD 1.4 billion.

The company’s primary business activity is the provision of passenger and aircraft ground handling services. Employing around 400 people, the company offers a range of handling services including ramp handling, transport services, aircraft weight and balance and ramp coordination at seven airports in Australia and New Zealand. The company has experienced consistent revenue growth in recent years recording sales of $AUD 7.3 million, $AUD 14.8 million and $AUD 19.2 million in 2005, 2006 and 2007, respectively (Company Annual Reports). The firm performs the ground handling for three major international airlines at Perth Airport and presently holds around 35 per cent of the market, as measured in terms of flights handled\(^{20}\). The company earns its revenue from their contracted airlines flight handling fees. These fees cover the costs of unloading and loading the aircraft, passenger check-in, baggage services, and other related aircraft operational functions.

- **International airline (SIA Cargo)**

SIA Cargo is an Asian based airline that has been in business for over fifty years. At the time of the present study the company had a fleet of 103 passenger aircraft and 12

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dedicated freighter aircraft. The airline is a major combination carrier ranked amongst the major carriers globally. The value of the SIA Groups total assets as at 31 March 2009 was $USD 24.8 billion. The company’s operating profit during the 2008/09 financial year was $USD 904 million. SIA Cargo is a publicly listed company, with the major shareholder, a major Asian based investment company, holding 54 per cent of the shares as at 31 December 2007. The second largest shareholder is a major Asian banking institution with a 15.4 per cent shareholding. There are a further eight shareholders, consisting of banks, private individuals, and investment companies, that hold a 24 per cent shareholding in SIA Cargo, with the balance of the shares held by small investors. Air freight is regarded as a strategic core business activity. The belly-hold revenue from SIA Cargo was $USD 1.34 billion in 2008/09 financial year. In 2001, SIA Cargo’s Cargo Division was corporatized as SIA Cargo (Hill 2004, p. 52).

SIA Cargo provides a range of air freight products including premium time-definite products, perishables products, and airport-to-airport freight services. The airline operates an extensive network of both passenger and dedicated freighter aircraft to North and South Asia, North America, the Middle East, Africa and Europe. In 2008/09, the airline carried around 1.21 million tonnes of air freight, which equated to 7,299.3 million freight tonne kilometres performed (FTKs). SIA Cargo has experienced strong growth in terms of air freight tonnage carried and freight and freight tonne kilometres performed in recent years. In 2009, SIA Cargo was the sixth largest air freight carrying airline globally (as measured by FTKs performed) (International Air Transport Association 2010, p. 1).

SIA Cargo has operated services to Australia, including Perth, for many years. The Perth air freight market is extremely competitive, with the supply of available capacity significantly exceeding market demand. The air route from Perth to Hong Kong is served by six major airlines (either direct or via a home-based Asian hub). Historically, SIA Cargo has focused on providing a high quality service at a reasonable cost particularly for rock lobster traffic – this has enabled SIA Cargo to capture a significant share of the western rock lobster market to Hong Kong. The transportation of live western rock lobster exports to Hong Kong is regarded as a highly important market for the airline accounting for a
large percentage\textsuperscript{21} of the traffic uplifted by SIA Cargo from Perth. Currently, SIA Cargo operates 21 services per week from Perth to Hong Kong via its Singapore Changi Airport-based hub, with wide-body aircraft, offering around 360 tonnes of capacity per week. SIA Cargo operates 42 passenger and seven dedicated freighter services from its home base to Hong Kong, offering around 873 tonnes of total cargo capacity per week over the sector.

- **Ramp handling agent (Hong Kong)**

The sixth chain actor is Singapore Airlines/SIA Cargo ramp handling agent at Hong Kong International Airport. A private listed company, the firm has been in business for seven years and is one of the three franchised independent ground handling agents providing aircraft and passenger handling services at Hong Kong International Airport. The company is owned by four shareholders. The major shareholder is a Hong Kong based airport ground handling company who holds 70 per cent of the company’s shares. The second and third largest shareholders are two global international airlines who each hold 15 and 10 per cent of the shares, respectively. The final shareholder is a major European based global airport services provider who holds the remaining 5 per cent. The company is a member of the International Air Transport Association (IATA) Ground Handling Council and was certified as AHS1000 compliant by IATA in 2000. In addition, the firm received their ISO 9001: 2000 accreditation from Lloyd Register Quality Assurance in 2005.

The primary business activity is the provision of airport ground handling services for client airlines at Hong Kong International Airport. The company offers a range of handling services including ramp handling, transport services, aircraft weight and balance and ramp coordination and holds around 60 per cent of the third party ramp handling market at Hong Kong International Airport (excluding Hong Kong based airlines).

The company has a workforce of 700 and has around 1,300 pieces of ground service equipment used to handle its customer’s aircraft\textsuperscript{22}. The company earns its revenue from their client base of 30 airlines flight handling fees. These fees cover the costs of unloading

\textsuperscript{21} For confidentiality reasons, the exact percentage of lobsters uplifted was considered commercially sensitive.

\textsuperscript{22} For confidentiality reasons the total value of the company’s assets are not available in the public domain.
and loading the aircraft, passenger check-in, baggage services, and other related aircraft operational functions.

- **Cargo terminal operator (Hong Kong)**

SIA’ Cargo air freight operations are handled by one of the of the two franchised air cargo terminal operators located at Hong Kong International Airport (Airport Authority Hong Kong 2008, p. 2). The company, a private listed firm with an issued capital of $HKD 360 million, has been in business for fifteen years, and employs around 440 staff. The company is owned by five shareholders. Shareholder A is a subsidiary of a major global airline specializing in aircraft and cargo handling services; Shareholder B is a major company listed on the Hong Kong Stock Exchange, with diversified interests in the ownership and operations of ports and port-related activities and other industrial and infrastructure investments; Shareholder C is a wholly owned subsidiary of a major multinational company listed on the Singapore Stock Exchange, with interests in telecommunications, shipping and logistics; Shareholder D is a major global express freight carrier who also provides air freight transportation and logistics services; and Shareholder E is a fully owned subsidiary of a major Hong Kong Stock Exchange listed company whose business interests include property development and investment, warehouse ownership and operation, logistics services and various infrastructure related investments. The company’s total assets are estimated to be in excess of $HK 2.5 billion (Various company journals and newsletters, corporate brochures and press releases).

In July 1998, the company opened its $HKD 800 million Cargo Terminal One, at Hong Kong’s new international airport; the cargo terminal has the capacity to handle up to 600,000 tonnes of cargo per year. In March 2007, it opened its $HKD 1.75 billion Cargo Terminal 2 at Hong Kong International Airport, which has the capacity to handle 910,000 tonnes annually. The total capacity of the company’s two cargo terminals is 1.5 million tonnes per annum. The company’s operations are underpinned by a state-of-the art information technology systems (for cargo management and vehicle control). The Web-based Cargo Management System provides a suite of e-cargo solutions to customers and users by fully integrating with government, client airlines and other cargo community systems.
The company earns its revenue from air waybill documentation and cargo handling fees which are payable on all shipments handled, and also storage fees for cargoes that are not customs cleared and delivered within 48 hours of the air freight consignments' arrival in Hong Kong. The CTO’s client base consists of around 45 airlines, both scheduled passenger and dedicated freighter operators. The annual volumes of cargo handled (export, import and trans-shipment) by the company have displayed consistent growth over the past five years. In 2009, the company handled a total of 514,200 tonnes of air freight.

- **Hong Kong’s rock lobster/seafood import/trading market**

The final chain actor is a privately owned company that specializes in the importation and distribution of lobster and other seafood products from around the world. The estimated annual turnover of the company is in excess of $USD 3 million. The company maintains offices in Shenzhen and Hong Kong and employs around 10 staff.

### 4.2.3 Contractual relationships and chain structure

Figure 4.4 depicts the pattern of contractual relationships present in the chain; it also shows that the important interfaces between the exporter/processor and rock lobster fishers and the Perth-based international air freight forwarder, on the one hand, and the importer/trader and SIA Cargo on the other are managed within the framework of operating rather contractual relationships. This is not necessarily a problem, but it has the potential to permit the inequitable transfer of cost inefficiencies between actors (Robinson 2007b, p. 95).

The key operating link is, of course, that between the seller and the buyer – the Hong Kong based importer/trader. Note that the sale agreement may specify the terms of trade under which the rock lobster consignment is shipped and, in so doing, specify not only which actor bears the costs and insurance over which particular logistics pathways but it may also underline efficiency in ground-oriented landside air operations (Robinson 2007b: 95). Live rock lobster shipments moving under *fob or free on board* Incoterms requires the seller or western rock lobster exporter/processor, in this case, to bear the risks and costs of moving the rock lobster to the terminal (Robinson 2007b, p. 95; Tan and Thoen 2000,
under \textit{fca} or \textit{free carrier (named place)} requires the seller to assume responsibility for all risks and costs until the goods are delivered to the named place and collected by the carrier nominated by the buyer; under \textit{cfr} or cost and freight terms the seller clears goods for export and is responsible for delivering them to the nominated carrier and pays the costs of transporting the goods to the nominated destination and, under \textit{cif or cost, insurance, freight} terms the buyer bears the risk and cost (Willmott 2001, p. 60). Under \textit{fob} terms there may be particular competitive advantage and benefit for the seller to operate an efficient landside chain (Robinson 2007b, p. 95). In this case study chain, all live western rock lobster exports are shipped on a \textit{cfr} basis, while all frozen western rock lobster exports are shipped on a \textit{cif} basis.

\textbf{Figure 4.4.} The contractual relationships in the western rock lobster air freight chain from Perth to Hong Kong.
The rock lobster exporter and the international air freight forwarder have an operational agreement that underpins their relationship. Under this agreement, both parties have agreed to specific handling and logistical arrangements to ensure that the rock lobster export shipments move in a timely and efficient manner to Hong Kong.

Figure 4.4 suggests that the Perth-based international air freight forwarder does not have any formal contractual agreements with SIA Cargo; rather they work on an operational basis only. Importantly, the international air freight forwarder has dedicated air freight space allotments with SIA Cargo on their services from Perth to Hong Kong to accommodate their shipper’s rock lobster consignments. A similar situation applies with the international air freight forwarder and SIA Cargo’s cargo handling agent at Perth Airport, whereby all dealings with the cargo terminal operator are on a shipment by shipment transactional basis. The Perth-based CTO and ramp handling agent also operate on an operational basis only.

The Hong Kong International Airport-based CTO and ramp handling agent conduct business on operational basis only. A similar situation applies to the Hong Kong-based importer/trader and SIA Cargo and SIA Cargo’s contracted Hong Kong based CTO who also operate on the basis of an operating arrangement as opposed to a formal contract.

The contractual linkages in the chain are those between Singapore Airlines/SIA Cargo and its appointed cargo handling agent and ramp handling agent at Perth Airport and with its appointed ramp handling agent and cargo terminal operator located at Hong Kong International Airport. Airline ground handling contracts with an independent service provider vary from full service outsourcing, where the ground handling firm provides the complete range of services for an airline at the airport it serves, to special package deals that may include cargo handling at one specific airport (Croft 2003, p. 5). The various contracts are based on the International Air Transport Association (IATA) ‘Standard Ground Handling Agreement (SGHA)’, document – a key feature of the IATA SGHA contract is that either party, under Article 11.5, can serve notice to rescind the contract any time by providing 60 day’s notice. Singapore Airlines/SIA Cargo has contracts with Westralia Airports Corporation and the Airport Authority Hong Kong to operate services to their respective airports. Finally, the Hong Kong-based ramp handling agent and CTO
operate have franchise contracts with the Airport Authority Hong Kong (Airport Authority Hong Kong 2008, p. 2).

4.2.4 Regulations and chain structure and dynamics

The first section of this case study has mapped and described the functional, corporate and contractual linkages in the chain. Before proceeding with the analysis of the value chain it is necessary to review the government regulatory influences on the western rock lobster fishery as these place significant constraints on the various chain actors. Also, as noted previously, international air services are governed by bilateral air services agreements (ASA). Accordingly, the following section briefly examines the Australia/Singapore and Singapore/Hong Kong ASA’s as these agreements significantly influence the number of air services that can be operated by airlines between the respective countries.

- Western Rock Lobster Fishery Management and Sustainability

The Western Australia Government has jurisdiction over the commercial rock lobster fishery in Commonwealth of Australia waters adjacent to Western Australia under an Offshore Constitutional Arrangement (OCS) with the Federal Government (Brayford and Lyon 1995, pp. 3-4).

The West Coast Rock Lobster Managed Fishery (WCRLMF) is a managed fishery under Section 65 of the Fish Resources Management Act 1994 (FRMA) (WA) (Fletcher at al. 2005, p. 14). The WCRLMF is managed by the Department of Fisheries, Western Australia (Morgan 2006, p. 90) in accordance with the various Notices and Orders under the Fish Resources Management Act 1994 (FRMA) (WA), West Coast Rock Lobster Managed Fishery License, and the West Coast Rock Lobster Management Plan 1993 (de Lestang et al. 2006, p. 14). The principal objective of the FRMA is sustainability of the resource, with an additional objective being to maximize the return to the community from the available aquatic resources of the State (Fisheries WA 1998, p.10). Both commercial and recreational fishing is administered through the provisions of the FRMA and the Fish

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23 See Appendix 4 for an overview of the Australian and Hong Kong SAR Government regulations applicable for the actors participating in the Western Australia to Hong Kong air freight market.
Resource Management Regulations 1995 (FRMR) (WA). This legislation provides for the gazettal of fishery management plans and the issuing and management of entitlements to facilitate commercial and recreational fishing (McCrea & Burton 2006, p.12).

- Western rock lobster fishery management controls

The WCRLMF is primarily managed using ‘input controls’ with some output controls (Table 4.1).

Table 4.1. Western rock lobster fishery management controls.

<table>
<thead>
<tr>
<th>Input Controls</th>
<th>Output Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited entry to the fishery</td>
<td>The Legal Minimum Length (LML) is 76 millimetres carapace length, except for the period 15 November to 31 January each season when a minimum legal size of 77 millimetres carapace length applies</td>
</tr>
<tr>
<td>Maximum number of pot entitlements for the fishery (which places an overall cap on effort); entitlements are transferrable under what is known as the Individually Transferable Effort (ITE) system</td>
<td>The maximum legal size for female rock lobsters is 115mm carapace length south of 30°S latitude and 105mm north of 30°S. There is no maximum size limit for male lobsters</td>
</tr>
<tr>
<td>Zonal management (Zones A, B and C)</td>
<td>Prohibition on the harvest of setose females or those carrying eggs or tarspot</td>
</tr>
<tr>
<td>Restrictions on pots (size, configuration and escape gaps)</td>
<td></td>
</tr>
<tr>
<td>Spatial and seasonal restrictions</td>
<td></td>
</tr>
<tr>
<td>Restriction on pots only being pulled during specific daylight hours</td>
<td></td>
</tr>
</tbody>
</table>

Source: adapted from Australian Government, Department of the Environment and Water Resources (2007, p. 4); Bray et al. (2006, p. 50); Chittleborough (1974, p. 233); Donohue (2000, pp. 19-22); Morgan (2001a, p. 138).

- Western rock lobster fishery boundaries

The boundaries for Western Australia’s rock lobster fishery are ‘the waters situated on the west coast of the State bounded by a line commencing at the intersection of the high water mark and 21° 44’ south latitude drawn due west to the intersection of 21°44’ south latitude...
and the boundary of the Australian Fishing Zone; thence southwards along the boundary to its intersection with 34°24’ south latitude; thence southwards along the boundary to the intersection of 115°08’ east longitude; thence due north along 115°08’ longitude to the high water mark; thence along the high water mark to the commencing point and divided into zones’ (Figure 4.5) (Rossbach et al. 2004, p. 14), but practically, lobster fishing extends from around 26°S to 34°S (Hall and Chubb 2001, p. 1657).

**Figure 4.5.** Western Australia’s western rock lobster fishing management zones.
Source: Courtesy Department of Fisheries, Western Australia (2004, p. 4).

The fishery is managed in three discrete zones (Figure 4.5), which distributes effort across the entire fishery, reducing concentration of effort and provides the potential for higher exploitation rates (de Lestang et al. 2005, p. 12). The zones are as follows: south of latitude 30°S (C-Zone), north of latitude 30°S (B-Zone), and, within this northern area, a third off-shore zone (A-Zone) around the Abrolhos Islands (Chubb 2001, p. 7). The WRLMF operates from all the ports between Denham and Bunbury, and from many anchorages on the whole of the west coast south of Turtle Bay (Shark Bay). Fishing effort is evenly divided between the Southern Zone (Zone C) and Northern Zones (A and B and Big Bank) (Figure 4.5) (Fletcher et al. 2005, p. 15).

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24 The Southern Zone includes the area of water between August and Leeman (Zone C of the commercial fishery) and the northern region, which includes the area of water between Leeman and North West Cape (Management Zones A and B of the commercial fishery) (Department of Fisheries, Western Australia 2005b, p. 1).
Western rock lobster harvesting season

In a general sense, the fishing season in the WCRLMF runs from 15 November to 30 June the following year, but the fishing season actually varies from zone-to-zone.

Specifically:

- Zone A is open from 15 March to 30 June;
- Zone B is open from November 15 to 30 June the following year, with a mid-season closure 15 January to 10 February; and
- Zone C is open from 25 November to 30 June the following year, with a three-day full moon closure in each month from February to June (Department of Fisheries, Western Australia 2007, pp. 13-14).

Fishers are permitted to take any species of rock lobster but the vast majority of the catches are western rock lobsters (McCrea and Burton 2006, p. 13).

Commercial Access and Quota

On 1 March 1963, the first restrictions were implemented in the WCRLMF with the number of rock lobster vessels in the industry being restricted to those already engaged in the industry, no new additional licences have since been issued (Fletcher et al. 2005, p. 15; Morgan 2001b, p. 80). To operate in the fishery, a vessel must have a Fishing Boat Licence (FBL) and requires a minimum of 63 units of pot entitlement to hold an active Managed Fishery License (MFL) (Western Rock Lobster Council 2007, p. 17). The number of fishing units specified on their Managed Fishing License (MFL) determines the quantity of pots that fishers are licensed to use on their vessels.

Under the existing management arrangements, 56,813 pots have been allocated to licensees. Because the capacity for Zones A and B are combined, licensees are able to transfer units between the discrete zones, in accordance with the provisions of clause 14G of the Western Rock Lobster Fishery Management Plan (Bray 2004, p. 4). For each
management zone, the numbers of licences and pots that can be utilized are outlined in Table 4.2 (Department of Fisheries, Western Australia 2007, p. 15).

<table>
<thead>
<tr>
<th>Zone</th>
<th>MFLs</th>
<th>Pots</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/B</td>
<td>300</td>
<td>27,509</td>
</tr>
<tr>
<td>C</td>
<td>301</td>
<td>29,304</td>
</tr>
<tr>
<td>Total</td>
<td>601</td>
<td>56,813</td>
</tr>
</tbody>
</table>

Source: adapted from Department of Fisheries, Western Australia (2007, p. 15).

As a condition of their fishing licences, each rock lobster fisher is required to supply a monthly record of the quantity caught, number of pots utilized, number of days fished, and the locality where the vessel was operating (Brown et al. 1995, p. 228; Morgan 1980, p. 83). The records cover map blocks 1° x 1°, each representing an area of around 3,600 nautical square miles. In addition, around thirty to forty per cent of fishers keep voluntary logbooks recording daily catches over smaller areas (300 nautical square miles) and various depth categories (Fisheries WA 2004, p. 5).

- Licensing of Western Rock Lobster Processors

The processing sector has been considered as an integral part of the fishery. Prior to 1966 any person who wanted to establish a rock lobster processing plant was free to do so. However, the FRMA was amended in 1966 to require each processing facility to hold a licence. Also, the Executive Director of Fisheries was given the power to grant or not to grant such a licence on the grounds of it being in the “better interests of the fishing industry” (Bowen 1994, p. 4).

Part 7, Section 80 of the FRMA outlines the restrictions governing the establishment and operations of fish and rock lobster processors in Western Australia (Department of Fisheries, Western Australia 2006a, pp. 3-4). Section 82 of the FRMA prohibits processing for a commercial purpose unless the person is authorized to do so by a fish processors licence or in a manner specified in the relevant fishery management plan (Fisheries WA 1998, p. 13). Other provisions of the FRMA also govern the establishment and maintenance of processing establishments.
In addition, Ministerial Policy Guidelines\textsuperscript{25} (MPGs) also govern the allocation of new authorizations within the context of the FRMA, further clarifying the role of the Executive Director and defining the constraints on rock lobster processing establishments (Department of Fisheries, Western Australia 2006, pp. 3-4).

Processors must supply the Department of Fisheries with monthly returns, which include the live weight of the catch from each fisher and details of processing (Brown et al. 1995, p. 229). When packed for export, lobsters are graded by size and these data provide an independent estimate of the total catch and its size structure (Fisheries WA 2004, p. 5).

The four western rock lobster processors are also European Union and United States Food and Drug Administration accredited, operate quality assurance programs endorsed by the Australian Quarantine and Inspection Service (AQIS), and all possess Registered Export Establishment Licences from the Australian Government (Western Rock Lobster Development Association 2007a, p. 1).

- **International airline services**

As noted in Chapter 3, international air services between countries are governed by bilateral air services agreements (ASA) negotiated between the two countries respective governments. On 23 September 2003, Australia and Singapore ratified a significantly liberalized ASA under which airlines of both countries are permitted to fly between Singapore and any point in Australia, as well as most intermediate points between the two countries, without restrictions (Ministry of Transport Singapore 2003).

The Hong Kong and Singapore Governments signed a liberal ASA on June 14, 2005. The agreement allows for unlimited passenger services between the two countries (Asian Wall Street Journal 2005).

\textsuperscript{25} At the time of writing there are presently three Ministerial Policy Guidelines (MPGs) relevant to rock lobster processing: MPG 2 “Foreign Interests in Rock Lobster Processing Authorisations”; MPG 3 “Determining a Fit and Proper Person for Rock Lobster Processing Authorizations”; and MPG 18 “Assessment of Applications for Rock Lobster Processing Authorisations and Imposing Licence Conditions”. Copies of these documents are available on the Department of Fisheries, Western Australia website <http://www.fish.wa.gov.au/docs/mp/mpg002_3_4/index.php>.
4.3 Mapping the Value Chain

Having established the stages and structure of the physical supply chain and the appropriate governmental regulations that apply to the chain actors, we can now focus our attention on the flow of value running back through the chain from the end customer. There are two key tasks to be completed. First, the share of total revenue captured at each stage of the chain needs to be ascertained. Second, the profit margins being earned by the actors at each stage of the chain also need to be documented. The data presented in the next section are based on the case interview survey data, and supported, where possible, from the participating firm’s annual reports and other peak industry body and government reports.

4.3.1 Chain margins and revenues in the chain

Which firms in the chain capture significant revenues and/or margins in the chain? The revenue shares in the chain are shown in Table 4.3 which reveals that 41 per cent of the revenues within the chain are accounted for in the catching / processing stage of the chain.

<table>
<thead>
<tr>
<th>Table 4.3. Revenue and gross profit margins in the lobster air freight value chain from Perth to Hong Kong.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobster Fishers</td>
</tr>
<tr>
<td>Typical gross profit margin (ROS %)</td>
</tr>
<tr>
<td>Typical distribution of revenue for the chain actors (%)</td>
</tr>
</tbody>
</table>

Source: Comprehensive survey of annual company and industry reports and interview data.

Yet the supply market is problematic. The WCRLMF is managed as an input controlled fishery. High levels of competition exist in the fishery, and this is referred to as the ’race to fish’. Competition encourages fishermen to fish harder – for example, by fishing more days, travelling longer distances, and using more bait – and fish smarter – for example, by using technology, more efficient vessels, and communications equipment. In the fully exploited WCRLMF, the only way a fisherman can consistently catch more than his
competitors, is to fish ‘harder’ and ‘smarter’ than others do. Hence, fishers invest a lot of money in bait, larger and faster boats (which cost more to purchase and operate) and the latest technology, to try and maintain or increase their share of the catch. Due to the inherent competitive nature of the current input control system, it is not easy for western rock lobster fishers to reduce their fishing costs and still optimize their share of the catch.

Recently the cost of fishing has been increasing while the real value of rock lobsters has been declining, resulting in a cost-price squeeze (Western Rock Lobster Council 2007, p. 6, p. 17). The other noticeable characteristic of the chain is the 35 per cent gross profit margin earned by the importer/trader in Hong Kong. Due to the competitive nature of the Hong Kong seafood import market, the importer/trader is able to leverage their position in the chain by receiving advantageous landed prices in Hong Kong. Moreover, the importer/trader has an established customer base which highly values their expertise and the quality of seafood products imported for distribution to both the Hong Kong and Southern China restaurant markets.

Furthermore, fluctuations in western rock lobster supply have an impact on prices received within a given season. More than 95 per cent of rock lobsters caught in Western Australia are exported to major markets in South East Asia, such as Hong Kong and China, Japan and the United States. This means the industry is highly dependent on the fluctuations in the Australian dollar against the United States dollar. Because most of the South-East Asian countries are linked to the United States dollar, trading in Asia is essentially trading in United States dollars. As the Australian dollar strengthens or weakens against the United States dollar, this has a most important impact on the trade in Asia (Western Rock Lobster Council 2007, p. 18) in terms of the landed prices/costs in Hong Kong. This situation is an extremely influential factor in the management of the chain.

- **Rock Lobster Fishers**

  The catching and processing sectors of the fishery are mutually dependent upon each other. The processing sector is reliant upon the fishers to supply rock lobsters in first class condition. Conversely, the fishers rely upon the processing sector to provide high quality processing of lobsters and sales to the global market as well as providing support services, that is, bait and other essential fishing requirements (Bowen 1994, p. 7). Despite this
inherent mutuality, rock lobster fishers are constrained by governmental regulation with regards to the volume of western rock lobsters that they can catch and also the predetermined period (the season), which specifies the times of the year when they are authorized to fish for lobsters. Western rock lobster fishers are also affected by the changing demand for certain lobster products, the time of the year including the season in the consuming country and the proximity to national festivals or special days, the change of the lobster colour and catch weight changes. In addition, the value of the lobster product is influenced by selling prices, exchange rates and weight loss (otherwise known as yield or recovery) and the variable processing costs (Marec 1994, pp.19-20). These factors when taken together significantly influence the margins which can be earned by lobster fishers, the net margins at this stage of the chain are around 5-6 per cent.

- **Lobster Exporter/Processors**

Despite the small number of authorized Western Australian-based processors (4) due to the highly competitive nature of the industry, the net margins at this stage of the chain are around 5 per cent. The ability of the exporter/processor to differentiate their products and build switching costs into the relationship are difficult due to the homogenous nature of the raw material, western rock lobsters. Under such circumstances, the primary method of earning above average profits will be to develop to a more customized service offering and to develop a superior productive capability (Cox et al. 2002, p. 154) and also seek alternative or new markets to enable economies of scale to be developed and to reduce the reliance on the Hong Kong market.

The rock lobster price varies according to catch and market conditions. In general, the fishers set a beach price on a daily or weekly basis. The processor pays for the product at the beach price and then needs to market the processed product at a higher price in Hong Kong so as to earn a profit margin. The processor confronts strong competition in Hong Kong from Cuba, Mexico, and South Africa.
• **International Air Freight Forwarder**

The margins at this stage of the chain are around 10 per cent as the exporter/processor (the buyer) has a strong, but cooperative, position *vis-à-vis* the supplier (the international air freight forwarder).

• **Cargo Terminal Operators – Perth**

Air cargo terminal operators offer highly standardized commodities. There is little that these firms can do to differentiate their products to build switching costs into the business relationships with their clients. Under these circumstances, the main method of earning above average profits will be to develop to a more customized service offering and to develop a superior productive capability (Cox et al. 2002: 154). There is evidence of this strategy being employed by the CTO in Perth who offer a range of value-added services, such as, customs clearance, and a range of trucking services. Even this, however, is unlikely to take the CTO beyond the industry average margin of 5-10 per cent.

• **Cargo Terminal Operators – Hong Kong**

The CTO in Hong Kong earns a net margin of around 10 per cent. Despite offering a highly standardized service, the company has diversified its services/product offerings and now provides a range of value-added services, such as, export consolidation, and a range of trucking services from Hong Kong to Southern China. Despite the range of services provided by the CTO, the company’s net profit margin is still in accordance with the industry average margin of around 10 per cent.

• **Ramp Handling Agents – Perth and Hong Kong**

Similar to the cargo terminal operators these firms offer highly standardized commodities. There is little that these firms can do to differentiate their products to build switching costs into the business relationships with their clients. Under these circumstances, the main method of earning above average profits will be to develop to a more customized service offering and to develop a superior productive capability (Cox et al. 2002, p. 154). Even
this, however, is unlikely to take a ramp-handling agent beyond the industry average margin of 5-7 per cent.

- **International Airline (SIA Cargo)**

As we have previously noted, international airlines have historically restricted their role in air freight chains to the airport-to-airport carriage of freight. In order to earn above average profits, airlines potentially can expand their service offerings to include additional services, such as ground transportation or customs brokerage, through alliances with third party service providers (3PSPs). Airlines have extremely high fixed costs, therefore the ability of SIA Cargo to earn a higher average margin of 4-5 per cent from air freight transportation, could come from the provision of additional value-added services.

- **Hong Kong-Based Importer/Trader**

The margins at this stage of the chain are around 25 per cent as the buyer has a strong, but cooperative, position vis-à-vis the supplier. Moreover, the importer/trader has multiple markets to source lobster products from, for example, Cuba, Mexico, South Africa, Vietnam, and therefore, can leverage the competitive nature of the market to sustain the company’s margins from its potential suppliers.

In sum, when analyzing the flow of value (Figure 4.6) along the live rock lobster air freight chain, the Hong Kong based importer/trader and the international air freight forwarder appear to earn larger net profits than SIA Cargo, and the cargo terminal operator and ramp handling agents. The importer/trader makes an average net profit margin of around 25 per cent compared to 4-5 per cent for SIA Cargo, with the rock lobster fishers making small margins of 5-6 per cent. The exporter/processor typically operates on a gross profit margin of around 25 per cent. However, this margin is generally absorbed by their high fixed costs, resulting in a net margin of around 5 per cent (Exporter/Processor Informant A).
Moreover, the profitability of the western rock lobster fishers and processors is complicated by the inherently cyclical nature of profitability in the industry. Recent research has shown that the profit margins in the Western Rock Lobster Fishery are shrinking due to variations in the price and volume of the catch and higher fishing costs (Western Rock Lobster Council 2007, pp. 17-18). In addition, as we have noted, the industry is facing stronger competition from rock lobster exporter/processors based in Cuba, Mexico, South Africa and Vietnam.

4.3.2 Value capture and the competitive dynamics of exchange

There are thirteen major dyadic exchange relationships present in the Perth to Hong Kong rock lobster air freight value chain. The competitive exchange dynamics for each of these dyads, and the wider interrelationships between them, are illustrated in the network model shown in Figure 4.7. The nature of these competitive dynamics, and the resultant distribution of value in the network, depends on the power structures of the individual actors. These power structures are represented using the nomenclature discussed in Chapter 2. To recap briefly, buyer power is indicated by the symbol (>), supplier power by
(>, buyer-supplier interdependence by (=), and buyer-supplier independence by (0) (Cox et al. 2002, p. 93).

Figure 4.7. The power regimes for the western rock lobster air freight chain from Perth to Hong Kong. 
**Key:** A = Rock Lobster Fisher(s); B = Exporter/Processor; C = International Air Freight Forwarder; D = CTO (Perth Airport); E = Ramp Handling Agent (Perth Airport); F = International Airline (SIA Cargo); G = Ramp Handling Agent (Hong Kong); H = Cargo Terminal Operator (Hong Kong); I = Importer/Trader (Hong Kong).

- **Rock lobster fishers and processors**

The first of the thirteen exchange dyads is that between the rock lobster fishers (A) and the rock lobster exporter/processor (B). Western Australian commercial rock lobster fishers are ‘price takers’, that is, they are not large enough (nor have a differentiated product) in the global market to set the price they receive for their product. Many factors affect the price received, including variations in supply by other producers, variations in the supply by Western Australia rock lobster fishers, world exchange rates, and other global events (Department of Fisheries, Western Australia 2005a, p. 28). Western rock lobsters are bought wholesale, and after processing, are sold to Hong Kong-based importer/traders’. A major element of the costs of doing this is the ‘beach price’ of the raw material (western rock lobsters). These costs are set by the rock lobster fishers on a daily basis. The most significant cost of sale incurred by the exporter/processor is the buying of the raw material. It is this factor that has the greatest impact on the firm’s net profit margins, which average around 5 per cent.
The rock lobster market is highly regulated and is therefore a very restricted one. There are only four licensed processors in the market. The barriers to entry are very high. There are also low buyer search costs as customers are very knowledgeable. Due to the nature of their operations, the buyers have a very good understanding of fishers’ technologies, catch rates, and an understanding of the costs of fishing. The exporter/processor also possesses significant power resources. The exporter/processor effectively operates in an oligopolistic market, now that the number of Western Australia based licensed processors has reduced to four. Consequently, the rock lobster fishers have only a small number of firms licensed to purchase their daily rock lobster catches.

Once these two sets of power resources are combined, we can see that the commercial exchange dyad is characterized by a condition of structural interdependence $(A = B)$ (Figure 4.7). This is because there is a high degree of supplier scarcity, a high level of buyer scarcity, and low search costs for the buyer $(B)$ (Cox et al. 2002, p. 156). This position of interdependence is recognized by the actors on a day-to-day basis. The fishers recognize the need for the exporter/processor to have sufficient funds to invest in new technologies that will reduce costs. Furthermore, the fishers recognize that a close relationship with the exporter/processor is mutually beneficial. The end-customers are extremely price-sensitive; therefore it is in the interests of the fishers’ to assist the exporter/processor in reducing costs of the landed price in Hong Kong so as to make their products more attractive to the Hong Kong-based importer/traders.

The exporter/processor shares a similar attitude. It is essential to the processor that the importer/traders in Hong Kong continue to purchase its products. The Hong Kong seafood market is highly competitive. It is therefore essential that the processor reduces costs, so that effective demand is increased. Western rock lobsters represent a very large part of the processors business annual turnover.

Thus, the power attributes of the buyer and supplier are as follows: few buyers (there are only four authorized exporter/processors operating in Western Australia), with one or more supplier (rock lobster fishers); buyer (exporter/processor) may have a large, but not necessarily the total, share of the fisher’s sales; the supplier (rock lobster fishers) and buyer switching costs (exporter/processor) are relatively high (in terms of perceived risks of finding either a new buyer and appropriate supplier); the supplier (rock lobster fishers)
finds the buyers (exporter/processor) account attractive; the search and transaction costs to find alternative suppliers are relatively low for the exporter/processor; and the supplier (rock lobster fishers) has potential product information asymmetries against the buyer (exporter/processor) (knowledge of where to source product that conforms to end-user requirements) with the exporter/processor (Cox and Chicksand 2005, p. 659).

- **Exporter/processor and air freight forwarder**

  The commercial exchange relationship between the exporter/processor (B) and the air freight forwarder (C) is represented in Figure 4.7 as (B = C), which means that these companies also conduct business under conditions of structural *interdependence*. This is because the exporter/processor works closely with the air freight forwarder who arranges the transportation requirements on the exporter/processors behalf. Their relationship is very close and collaborative.

  Australia’s international air freight market is highly regulated by DOTAR’s and the International Air Transport Association and is therefore restricted to those companies that satisfy their stringent requirements. There are around sixty authorized international air freight forwarders operating in the Perth market. There are five major international air freight forwarders specializing in the handling of perishable cargoes. The barriers to entry are quite low. There are also low buyer search costs as customers are very knowledgeable. Due to the nature of their operations, the buyers have a very good understanding of the air freight forwarders service offerings.

  The air freight forwarder also possesses significant power resources. Forwarder A has extensive experience and expertise in handling perishable air freight cargoes (particularly rock lobsters), has strong relationships with the airlines serving the Perth market, and access to state-of-the-art warehouse facilities. Forwarder A’s net profit margin is around 10 per cent.

  Therefore, the power attributes of the buyer (exporter/processor) and the supplier (air freight forwarder) are as follows: there are few buyers (rock lobster exporter/processors), with one or more suppliers (international air freight forwarders) that have the facilities and expertise necessary to handle highly perishable and valuable rock lobster consignments;
buyers (rock lobster exporter/processors) may have a large, but not necessarily the total share of market sales for the supplier (air freight forwarder); the supplier and buyer switching costs are relatively high (in terms of perceived risks of finding either a new buyer and appropriate supplier); the supplier (air freight forwarder) finds the buyer’s (rock lobster exporter/processor) account attractive but the buyer highly values the supplier’s expertise, market knowledge and contacts; search and the related transaction costs to locate alternatives are relatively low for the buyer (rock lobster exporter/processors); and services provided by the air freight forwarder are relatively standardized and information asymmetry can favour the supplier (air freight forwarder) (Cox et al. 2006, p. 7).

- **Exporter/processor and the Hong Kong-based importer/trader**

The commercial exchange relationship between the exporter/processor (B) and the importer/trader located in Hong Kong (I) is represented in Figure 4.7 as (I > B), which means that these companies conduct business under conditions of buyer dominance. The net profit margins typically earned by the Hong Kong-based seafood importers/traders are far higher than one would expect in commoditized exchange. Net margins of 25 per cent are typical. In a commodity market situation, rival suppliers are typically differentiated based on price, and the buyer is able to switch suppliers with relative ease and at little or no cost should a more favourable deal emerge. Furthermore, the importer/trader’s search costs are quite low, because western rock lobster products are relatively homogeneous. Together, these factors mean that the exporter/processor is forced to pass value to the importer/trader, in the form of price reductions, simply to retain his or her custom (Cox et al. 2002, pp. 93-94).

Hence, the Hong Kong-based seafood importers/traders normally possess buyer dominance when they source commoditized products that are sold on a price basis relative to a given quality standard. This is because they have the following key power levers over suppliers: there are few buyers (importer/traders), with many potential suppliers, not only located in Western Australia, but also in Vietnam, Mexico, South Africa and Cuba; the import/trader provides the exporter/processor with high volumes of business which accounts for a large percentage of the exporter/processors annual business turnover; supplier switching costs (exporter/processor) are high, those of the buyer are relatively low; the buyer’s account (importer/traders) is very attractive to the supplier for revenue;
supplier offerings (exporter/processor) are standard and commoditised; buyer (importer/traders) search costs are low; and Information asymmetry favours the buyer (importer/traders).

- **Air freight forwarder and cargo terminal operator**

The relationship between the air freight forwarder and the cargo terminal operator (CTO) located at Perth Airport is represented in Figure 4.7 as \((C = D)\), which means that the two parties conduct business under conditions of *interdependence* \((=)\). As we discussed earlier, the air freight handling market at Perth Airport is a very restricted one. There are only two firms in the market. The barriers to entry are very high, especially given the small volumes that currently characterize the market, and the high degree of governmental regulation that cargo terminal operators need to comply with. There are also very low buyer search costs. Despite the small number of CTO’s operating in Perth, the service offering of both firms is basically the same. Despite its significant market share, the CTO is unable to premium price their service, because they are still in competition with their competitor, and volumes are very small when compared to those handled by Sydney and Melbourne Airports. Net profit margins are around 4-5 per cent. It is essential to the CTO that Freight Forwarder A continues to purchase its services as international air freight forwarders represent the major source of the CTO’s business revenue.

In addition, air freight forwarders’ are extremely knowledgeable customers. Due to the nature of their business, these firms have a very good understanding of the Perth air freight market. Thus, the CTO is selling a specialized service, but commoditized offering, to a relatively concentrated and well-informed customer base. The CTO also possesses significant power resources. The CTO effectively operates in a monopoly supply market, holding around 70 per cent of the market-share, and more particularly, handling the major airlines serving the Perth international air freight market. Consequently, Forwarder A has no alternative when accessing SIA Cargo’s services. In addition, due to the highly specialized services provided by the CTO, Forwarder A would not want the market leader to exit the market.

When the two sets of power resources are combined together, we can see that this exchange dyad is characterized by a condition of *interdependence*. Forwarder A is one of
Western Australia’s largest international air freight forwarders and due to the volume of business the company works closely with the CTO (D) to ensure that the CTO satisfies its handling requirements in an efficient manner. Their relationship is therefore very close and collaborative. Indeed, this state of interdependence is recognized by both actors on a day-to-day basis. This is because the power attributes of the buyer and supplier can be summarized as follows: there are few buyers, with only two Perth Airport based cargo terminal operators (suppliers); Forwarder A may have a large, but not total, share of market revenue for the CTO; the CTO finds Forwarder A’s account attractive and Forwarder A highly values the CTO knowledge and experience in handling cargo; the CTO’s service offering is relatively unique; and the CTO may have some moderate information asymmetry advantages over Forwarder A (Cox and Chicksand 2005, p. 656).

- **Cargo terminal operator and ramp-handling agent**

As Figure 4.7 shows the dyadic relationship between the Perth Airport-based CTO and the ramp handling agent is characterized by *independence* (0) or commoditized exchange. This situation arises when neither party has power over the other (Cox et al. 2002, p. 226) as the decision to utilize their respective services is made by Singapore Airlines/SIA Cargo. Both the CTO (D) and the ramp handling agent (E) are selling specialized services to a relatively concentrated and well-informed customer base. As with all commodity-based exchange relationships, the buyer’s (international airlines) search and switching costs are relatively minimal. As we have previously noted, the CTO (D) and the ramp handling agent (E) have separate contracts with Singapore Airlines/SIA Cargo based on the IATA ground handling contractual agreement. Typically, these contracts are signed for periods of between three and five years. Whilst, the ramp handling agent (E) also provides an air freight handling service, and is therefore a competitor to CTO (D), Singapore Airlines/SIA Cargo has decided to award its air freight and ramp handling contracts separately at Perth Airport to ensure its quality standards are maintained and to achieve the optimal handling prices. Accordingly, both the CTO (E) and the ramp handling (E) work closely to service Singapore Airlines/SIA Cargo’s air freight and ramp handling requirements at Perth and their relationship can be described as close and collaborative.

Thus, the power attributes of the buyer and supplier are as follows: the CTO has little dependence on the ramp handling for revenue; both the CTO and the ramp handling
agents switching costs are low; both players provide a standardized service offering, which taken together is considered attractive by Singapore Airlines/SIA Cargo, and through their joint service offering both the CTO/ramp handling agent earn valuable revenue in a relatively concentrated and small market; the buyer’s (Singapore Airlines/SIA Cargo’s) search costs are low; and the CTO has very limited information asymmetry advantages over the ramp handling agent.

- **Air freight forwarder and SIA Cargo**

The next dyadic relationship in the chain is that between the air freight forwarder (C) and SIA Cargo (F). The relationship is represented in Figure 4.7 as (C 0 / > F), which means that these companies conduct business under conditions of structural *interdependence* (=) or *buyer dominance* (>). This means that SIA Cargo normally has limited power to extract value from the air freight forwarder. If value improvement occurs (either in the form of lower air freight rates or better service quality for specific products) it is normally determined by SIA Cargo in response to competitive pressures in the market (Cox and Chicksand 2005, p. 655). This is due to the following factors: the relatively low number of alternative air freight forwarders for SIA Cargo to source business from in the local market; there are other alternative airlines for the air freight forwarder to select from when shipping rock lobster consignments to Hong Kong; the switching costs for both SIA Cargo and the air freight forwarder are relatively low; the air freight forwarders account is a very attractive source of revenue for SIA Cargo; SIA Cargo service offerings are standard and commoditized; the air freight forwarder search costs are low; and information asymmetry typically favours the buyer (air freight forwarder).

Given this, the power regime oscillates between *buyer dominance* for the air freight forwarder (when there are many sources of supply for air freight space from Perth to Hong Kong, with constant price wars occurring, such as in the quiet winter season for airlines or the product is a low value commodity, such as broccoli, where the air freight rate heavily influences the landed price in Hong Kong) or structural *interdependence* for SIA Cargo, where SIA Cargo is in a stronger bargaining position with the air freight forwarder, and is therefore able extract a higher share of commercial value from the exchange (and therefore higher returns) (Cox and Chicksand 2005, p. 656). Thus, the relative power of SIA Cargo is dependent upon air freight space scarcity. When air freight space is in short
supply, typically for a short period of times throughout the year (for example, Chinese New Year and Christmas) then SIA Cargo is able earn higher than normal returns. This buyer dominance situation exists when there are no real alternative sources of air freight space for the international air freight forwarder, such as the busy Christmas period, with no price wars, and the product is a high value premium product, such as rock lobsters. Overall, SIA Cargo’s net profit margin is estimated at around 6 per cent.

- Perth Airport-based CTO/Ramp handling agent and Singapore Airlines

Singapore Airlines/SIA Cargo (F) commercial exchange relationships with its contracted CTO and ramp handling agent at Perth Airport are characterized as buyer dominant (>). International airlines have buyer dominance when they source commoditized products or services, such as their air freight and ramp handling services, relative to a given standard. This is because they possess the following key power levers over potential suppliers: there are few buyers (international airlines serving Perth); Singapore Airlines/SIA Cargo’s account represents a high volume relative to the CTO and handling agent’s business turnover; SIA Cargo’s switching costs are relatively low; Singapore Airlines/SIA Cargo’s account is very attractive to supplier’s for revenue; the handling agent service offerings are standard and commoditized; SIA Cargo’s search costs are low; and information asymmetry favours Singapore Airlines/SIA Cargo.

These power characteristics ensure that when international airlines negotiate with potential handling agents the relationship is typically commercially unequal. This is because the handling agents are normally highly dependent on international airlines for business (due to the requirement to achieve high utilization of fixed assets), and must supply standardized service offerings which minimizes the returns earned by handling agents. Net profit margins at this stage of the supply chain are around 4-5 per cent.
Case Study Number 1

- Hong Kong Airport-based Ramp handling agent/CTO and Singapore Airlines/SIA Cargo

Similar to the power circumstances between Singapore Airlines/SIA Cargo Perth-based ramp handling agent and CTO at Perth Airport, the power relationships between Singapore Airlines/SIA Cargo and their ramp handling agent and cargo terminal operator at Hong Kong International Airport is characterized as buyer dominance (>). This is due to international airlines possessing buyer dominance when they source commoditized products or services, such as their cargo handling contracts, relative to a given standard. In this chain, Singapore Airlines/SIA Cargo possesses the following key power levers over potential suppliers: Singapore Airlines/SIA Cargo is one of the major airlines serving Hong Kong, therefore Singapore Airlines/SIA Cargo account represents a high volume relative to the handling agent’s business turnover; Singapore Airlines/SIA Cargo’s switching costs are relatively low; Singapore Airlines/SIA Cargo’s account is very attractive to suppliers (ramp handling agent and CTO) for revenue; both the ramp handling agent and the cargo terminal operator service offerings are standard and commoditized; Singapore Airlines/SIA Cargo’s search costs are low; and information asymmetry favours the international airline (Singapore Airlines/SIA Cargo).

- Ramp-handling agent and cargo terminal operator

The dyadic relationship between the ramp handling agent (G) and the CTO (H) at Hong Kong International Airport is characterized by independence (0) or commoditized exchange. This is because neither party possesses power over the other (Cox et al. 2002: 226) as the decision to utilize their respective services is made by Singapore Airlines/SIA Cargo. Both ramp handling agent (G) and the CTO (H) are selling specialized services to a relatively concentrated and very well-informed customer base. As with all commodity-based exchange relationships, the buyer’s (international airline customers) search and switching costs are relatively minimal (Cox et al. 2002, p. 223).

The Hong Kong International Airport Authority policy is to award franchises to aircraft handling and cargo handling service providers. Presently, there are two franchised cargo
terminal operators and three passenger and aircraft ramp handling companies operating at Hong Kong International Airport. Consequently, all airlines operating to Hong Kong select their preferred ramp and cargo handling agents based on their ability to satisfy the airlines service requirements and the associated costs of providing these services. Similar to the contractual arrangements in Perth, both the ramp handling agent (G) and the Hong Kong based CTO (H) have contracts with Singapore Airlines/SIA Cargo based on the IATA ground handling contractual agreement. Accordingly, both the ramp handling agent (G) and the CTO (H) work very closely to service Singapore Airlines/SIA Cargo passenger/aircraft ramp handling and air freight handling requirements at Hong Kong International Airport and their relationship can be therefore be described as close and collaborative.

Thus, the power attributes of the CTO and the ramp handling agent can be summarized as follows: the CTO has little dependence on the ramp handling agent for revenue; both the CTO and the ramp handling agents switching costs are low; the CTO and the ramp handling agent provide a standardized service offering, which taken together is considered attractive by Singapore Airlines/SIA Cargo, and through the joint offering both the CTO/ramp handling agent earn valuable revenue; the buyer’s (Singapore Airlines/SIA Cargo) search costs are low; and the CTO has very limited information asymmetry advantages of the ramp handling agent.

- **Cargo terminal operator and the importer/trader**

As Figure 4.7 shows the dyadic relationship between the CTO (H) and the importer/trader (I) is characterized by independence (0) or commoditised exchange. This situation arises when neither party has power over the other (Cox et al. 2002, p. 226). The CTO (H) is selling a specialized service to a relatively concentrated and well-informed customer base. As with all commodity-based exchange relationships, the buyer’s search and switching costs are relatively minimal, the supplier must pass value to the customer by pricing in line with its costs of providing services (Cox et al. 2002, p. 223). However, due to the large volume of business handled at Hong Kong’s International Airport\(^\text{26}\), the CTO is able to earn a net margin of around 10 per cent. Notwithstanding, the CTO has high fixed costs, and

\(^{26}\) Hong Kong International Airport handled 3.3 million tons of air freight in 2009. The airport was the world’s second largest airport in terms of total air freight handled, and was the world’s largest airport in terms of international air freight handled (Airports Council International 2010).
therefore needs to maintain strong relationships with its customer base to ensure consistent and strong revenue generation.

Thus, the power attributes of the buyer and supplier are as follows: there are many buyers (importer/traders) and only a few suppliers (CTO); the buyer (I) has a relatively low share of the CTO (H) total revenue; both the supplier (CTO) and the buyer (importer/trader) switching costs are low; the CTO’s service offering is a standardized commodity; the buyer’s (importer/trader) search costs are low; and the CTO has very limited information asymmetry advantages of the buyer (importer/trader).

- **SIA Cargo and the importer/trader**

The final dyadic relationship in the chain is that between the airline (F) and the importer/trader (I). As Figure 4.7 shows, this dyadic relationship is characterized by independence (0) or commoditized exchange. Under the agreement between SIA Cargo and its contracted CTO in Hong Kong, the importer/trader is required to obtain all inbound western rock lobster shipment airway bills and the shipment delivery receipt from SIA Cargo, in order to complete the Hong Kong customs clearance formalities and take delivery of the consignment. Western rock lobster shipments provide a high yield for SIA Cargo, thus the airline aims to work cooperatively with the various Hong Kong-based importer/traders to ensure that the level of customer service is high.

Hence, the power attributes of the buyer and supplier are as follows: there are many rock lobster importers/traders and six alternative suppliers (airlines that serve the Perth to Hong Kong air freight market); both the supplier (SIA Cargo) and the buyer (importer/trader) switching costs are low; SIA Cargo’s service offering is a standardized commodity; the buyer’s (importer/trader) search costs are low; and SIA Cargo has very limited information asymmetry advantages of the buyer (importer/trader).
4.4. **Airline Strategy in the Perth to Hong Kong Rock Lobster Air Freight Market: Singapore Airlines Cargo**

SIA Cargo has strategically positioned itself as a high quality airline when serving the Perth to Hong Kong rock lobster air freight market. The strategic focus of SIA Cargo is primarily on the airport-to-airport carriage of air freight shipments as opposed to the provision of a broad range of logistics solutions, such as, customs clearance, local collection and delivery services. This suggests that SIA Cargo has focused on achieving operational effectiveness by trying to perform similar activities better than its competitors perform them. Operational effectiveness includes but is not restricted to efficiency (Porter 1998, p. 40). Porter (1998, p. 40) notes that differences in operational effectiveness amongst firms are pervasive. In recent years SIA Cargo has placed considerable focus on product innovation and e-business systems. The use of advanced e-business systems and the provision of specialized aircraft containers designed for the carriage of perishable air freight shipments were highly regarded by both the exporter/processor and the freight forwarder and therefore assists SIA Cargo’s ability to earn a reasonable margin from its air freight transportation of western rock lobsters from Perth to Hong Kong.

Whilst providing highly efficient services is regarded positively by SIA’s customers in both Perth and Hong Kong, the level of value that it captures from its participation in air freight chains is clearly limited by a strategy of limiting services to airport-to-airport transportation. In contrast, the integrated carriers (for example, FedEx and UPS) have captured significant market share through the provision of fully integrated product offerings which are highly valued by air freight shippers around the world.

4.5 **Singapore Airline Cargo’s Value Appropriation Outcomes in Buyer and Supplier Exchange.**

As we have previously noted there is a range of relationship management styles that supply chain actors can utilize to achieve their commercial goals (strategic ends), as well as the theoretically possible power circumstances that both parties to an exchange transaction might operate within. Recall that Cox et al. (2004, p. 96) argues that there are eight types of *relationship management styles* – buyer-dominant arm’s-length relationship, buyer dominant collaborative relationship, buyer-supplier reciprocal arm’s-length
relationship, buyer supplier reciprocal collaborative relationship, supplier dominant arm’s-length relationship and supplier dominant collaborative relationship – that are most appropriate for the effective attainment of particular value appropriation outcomes under specific power circumstances. This section applies Cox’s relationship management styles framework in the context of this case study’s supply and value chain to identify and discuss the relationship management styles that SIA Cargo has when acting as a buyer and supplier, respectively.

SIA Cargo, when acting as a buyer of its passenger/aircraft ramp and air freight handling services in Perth and Hong Kong, enjoys buyer dominant collaborative relationships. This is because when purchasing contracted handling services (air freight and aircraft ramp handling), Singapore Airlines/SIA Cargo is in a buyer dominant position, and is therefore able to set price and quality standards now, and the ‘stretch’ targets for the future. Importantly, SIA Cargo recognizes that the innovation in functionality and the costs of ownership required from suppliers is only possible when they have guaranteed commitment to a relationship and volumes of work (in this case, SIA Cargo provide handling agents with large air freight volumes to be handled and scheduled aircraft turnaround), with guaranteed margins. By providing these certainties SIA Cargo is providing their suppliers with the confidence that they should make long-term dedicated investments in the relationship in order that innovation in handling services and cost reduction can take place over time. In this power scenario, therefore, SIA Cargo dominates and pursues an adversarial commercial strategy with collaboration operationally. SIA Cargo’s suppliers, on the other hand, have to accept a non-adversarial commercial strategy, but must accept collaboration operationally at the direction of SIA Cargo, thereby accepting the volume of SIA Cargo’s business rather than high margins/profitability from the relationship (Cox et al. 2004, pp. 100-101).

Potentially, there can be interdependence (=) power outcomes when long-term collaborative relationships are established between handling agents (ramp and CTO) and international airlines, whereby above average returns are offered to handling agents in return for greater levels of guaranteed service and dedicated service offerings. This represents an attempt by the handling agents to lock-in opportunistic international airlines to ensure business continuity and conformity and, thereby, reduce risk. Notwithstanding, when there is a situation of many handling agents in the market, airlines tend to become
price and quality receivers and take advantage of their buyer dominance (> situation (Cox and Chicksand 2005, p. 655).

Conversely, when acting as the supplier of freight capacity and services from Perth to Hong Kong, SIA Cargo has a buyer-dominant collaborative relationship or a supplier-dominant collaborative relationship with the air freight forwarder. During the peak western rock lobster season when air freight capacity from Perth to Hong Kong is in strong demand, then SIA Cargo can employ a supplier-dominant collaborative relationship style. Conversely, the air freight forwarder can leverage their power position during non-peak or less busy times to extract more value from SIA Cargo through lower air freight rates.

When a buyer-dominant collaborative relationship exists, Freight Forwarder A is in a position to set the price now, and the ‘stretch’ targets of the future. Importantly, this type of relationship is based on a long-term and collaborative basis. SIA Cargo is a non-adversarial supplicant commercially, and accepts the air freight forwarder/shippers business rather than high profit margins. Forwarder A adversarially appropriates most of the value in this type of relationship by utilizing their power leverage to extract lower air freight rates from SIA Cargo.

When acting in a supplier-dominant collaborative relationship, SIA Cargo, by occupying a supplier dominance position, adversarially captures most of the commercial value created and has the ability to set prices. In addition, both SIA Cargo and Forwarder A, have a long-term operational relationship and work closely together operationally to service Forwarder A’s customer’s (exporter/processor) air freight transportation requirements to Hong Kong. Under these power circumstances, Forwarder A is a non-adversarial supplicant commercially, but operationally collaborative, who is required to pay SIA Cargo’s prices from Perth to Hong Kong. In this power scenario, therefore, Forwarder A dominates and pursues an adversarial commercial strategy with collaboration operationally. SIA Cargo, on the other hand, has to accept a non-adversarial commercial strategy, but must accept collaboration operationally at the direction of Forwarder A, thereby accepting the volume of Forwarder A’s business rather than high margins/profitability from the relationship (Cox et al. 2004, pp. 100-101).
4.6 The Alignment of Singapore Airline Cargo’s Buyer and Supplier Relationships in the Chain

The final part of this case analysis involves the determination of the relationship outcome for SIA Cargo when acting as a buyer and supplier, respectively. As we have previously noted, Cox et al. 2004, argue that there are three possible relationship outcomes: aligned, misaligned and sub-optimal and misaligned with dysfunctional conflict (Cox et al. 2004, pp. 129-130).

SIA Cargo when operating as a buyer enjoys an aligned relationship outcome. When buying services from its respective air freight and ramp handling agents, the parties fully appreciate the power circumstances they are in presently, and what it is likely to be in the future. The parties accept that this is the best that can be achieved and agree to work operationally in an appropriate fashion given the circumstances. The commercial benefits that both parties (buyer/seller) achieve are also accepted to be a direct result of the relative balance of power of SIA Cargo, primarily due to its scale of operations, and the significant revenues that their contract brings to the appointed suppliers. Moreover, both Singapore Airlines/SIA Cargo aircraft ramp and air freight handling agents are satisfied in both Perth and Hong Kong that this is presently the best commercial and operational agreement that they can consummate.

SIA Cargo’s relationship outcome when acting as a supplier can also be categorized as aligned. The parties in Perth (SIA Cargo and Freight Forwarder A) fully understand the current power circumstances that presently exist, and what is likely to be achieved in the future. Both actors recognize that this is the best outcome that can be achieved and agree to work operationally in the appropriate manner given these circumstances. Indeed,

“SIA Cargo really makes an attempt to understand our business and work with us…”
(Forwarder A Informant).

The commercial benefits that each side achieves are also accepted by both actors to be a direct result of their power positions, and both parties are satisfied that this is currently the
best commercial and operational agreement that they can enter into. Notwithstanding, as Cox notes, the major opportunities and risks in these circumstances are that there may be changes that enable one party to be opportunistic against the other, for example, a new airline service arriving in Hong Kong in the afternoon (the desired time of arrival by the Hong Kong-based seafood and lobster importer/traders) may be selected by the international air freight forwarder if the air freight costs are lower, or that one or both of the parties become complacent and inertia enters the relationship, such that better value for money deals are overlooked by one or both parties (Cox et al. 2004, pp. 129-130).

4.7 Case Summary

We can draw a number of conclusions from this case study. First, when acting as a buyer of services, SIA Cargo enjoys buyer dominance. However, when acting as a supplier of air freight capacity, SIA Cargo’s strategic leverage position oscillates between structural interdependence and supplier dominance. This is due to the demand for air freight space from Perth to Hong Kong being highly cyclical in nature. The cyclical nature of air freight capacity demand plays a major role in determining the level of value captured by SIA Cargo. The case study also found that SIA Cargo when acting as a buyer has an aligned relationship outcome. Similarly, SIA Cargo has an aligned relationship with the international air freight forwarder (Freight Forwarder A) when acting as the supplier of air freight capacity. Due to the perishable nature of air freight capacity, that is, it cannot be stored; SIA Cargo uses price mechanisms in quieter periods of demand to attract business. This strategy influences the level of value that it can capture from its participation in the Perth to Hong Kong air freight market.

Also, the power structures of each of the dyadic power relationships within the Western Australia to Hong Kong live rock lobster chain were also analysed in detail. It was stated that the key commercial exchange relationships in this supply chain are those that exist between the importer/trader in Hong Kong and the Perth-based exporter/processor, together with the relationship between the air freight forwarder and the Perth-based exporter/processor and the air freight forwarder and SIA Cargo. In this summary, these insights will be discussed in the context of the supply chain as a whole. The objective is to explain how and why value is captured at certain points within the chain. Commencing at the upstream end of the chain, we have observed that the rock lobster fishers (A) and
exporter/processor (B) are mutually dependent on each other. The actors conduct business under conditions of structural interdependence. Value flows through the chain towards the downstream end with reasonable efficiency. A similar situation applies with the relationship between the exporter/processor (B) and the air freight forwarder (C), who conduct business under conditions of structural interdependence. Both actors recognize the necessity to share value for their ongoing sustainability which has enabled the air freight forwarder to maintain a net return of around 10 per cent.

As we have noted earlier in this case, the pre-air transport stage of the supply chain presents two distinctive sets of exchange relationships. The first of these relationships is that between the air freight forwarder (C) and the Perth-based CTO (D), in which business is conducted under conditions of interdependence. This means that both actors are required to share value. The second set of relationships is that between international air freight forwarder (C) and SIA Cargo (F). The air freight forwarder typically operates under conditions of buyer dominance, with SIA Cargo (F) often being forced to pass value back through lower air freight prices.

SIA Cargo (F) operates under conditions of buyer dominance with the CTO (D) and ramp handling agent (E); value therefore flows from D and E to F. As we have seen, a similar situation occurs in Hong Kong where Singapore Airlines/SIA Cargo (F) enjoys buyer dominance over the ramp handling agent (G) and CTO (G), thus, value is passed to Singapore Airlines/SIA Cargo (F). The CTO (D) and the ramp handling agent (E) in Perth work under conditions of interdependence, and due to their strong and cooperative working relationship, little value flows between these two actors.

The ramp handling agent (G) and the CTO (H) in Hong Kong also work under conditions of interdependence, and due to their strong and cooperative working relationship, little value flows between these two actors. However, as we have noted value does flow from these actors to Singapore Airlines/SIA Cargo (F), due to its large operation and volume of business in Hong Kong.

The importer/trader (I) in Hong Kong has a distinct power advantage over the exporter/processor I, and their business is conducted under conditions of buyer dominance. Consequently, the exporter/processor is forced to pass value in the form of
lower prices. Indeed, much of the value generated in this chain is captured by the Importer/trader (I). In addition, the Cuba, South Africa and Vietnam lobster industries offer the importer/trader alternative options for lobster supplies. This factor is utilized when the importer/trader (I) is negotiating lobster orders with C. The final relationships in this exchange network are those between the Hong Kong based CTO (H), SIA Cargo (F) and the importer/trader (I). These relationships are characterized as independent. Due to the commoditized nature of their commercial exchanges, value typically flows to the importer/trader (I), albeit on quite a small scale.

A further important insight provided by this case, is that the creation and/or effective exploitation of critical assets is to a large degree constrained by regulatory requirements both in Western Australia and Hong Kong.
CHAPTER 5: STRATEGIC POSITIONING AND VALUE CAPTURE: CATHAY PACIFIC CARGO AND THE MELBOURNE TO HONG KONG ROCK LOBSTER AIR FREIGHT MARKET.

5.1 Introduction

The southern rock lobster\(^{27}\) is Victoria’s second most valuable commercial wild harvest fishery after abalone (Department of Primary Industries 2003a, p. 2). In 2007/08, rock lobster exports accounted for approximately twenty per cent of Victoria’s annual seafood exports (ABARE 2009, p. 28). Hong Kong is the largest single export market for the fishery. In order to optimize the salability of their products, rock lobster exporters utilize air freight services as their preferred transport mode when shipping consignments to Hong Kong.

This chapter presents the second case study, which maps and analyses the supply and value chain for the Victoria to Hong Kong rock lobster air freight chain and examines the strategies employed by Cathay Pacific Cargo (hereafter CX Cargo) to serve this important air freight market. The chapter is structured as follows: Section 5.2 maps the supply chain from a functional, corporate, contractual and regulatory perspective. Section 5.3 maps the corresponding value chain and analyses the chain margins/revenues and the value capture and competitive dynamics of exchange present between the actors participating in the chain. Section 5.4 examines the strategies employed by CX Cargo to serve the Melbourne to Hong Kong rock lobster air freight market; Section 5.5 examines CX Cargo value appropriation outcomes in the chain’s buyer and supplier exchange; Section 5.6 examines alignment of the CX Cargo’s buyer and supplier relationships in the chain and Section 5.7 presents the case summary.

\(^{27}\) In this case study lobster refers to the southern rock lobster.
5.1.1 Characteristics of the air freight market

Victoria’s southern rock lobster fishery is the State’s second most valuable fishery. However, the fishery is subject to extensive Federal and State Government regulatory oversight. In addition, the fishery has confronted significant economic factors that have heavily influenced the actors participating in the fishery. Therefore, the analysis presented in this case study also takes into account a number of important economic and regulatory variables that have impacted the demand and supply sides of Victoria’s southern rock lobster industry over the past decade. A key factor on the demand side has been the growth in southern rock lobster imports by Hong Kong. Indeed, the most lucrative market for the fishery is Hong Kong (Figure 5.1). In 2006, ninety four per cent of the State’s annual rock lobster exports were exported to Hong Kong (ABARE 2007b, p. 1).

The significant growth in Hong Kong importation of southern rock lobsters can be attributed to several key factors: the southern rock lobster (*Jasus Edwardsii*) is among the worlds most sought after crustaceans due to their succulent flesh. Furthermore, due to the lobsters size and bright red colour when cooked, the Chinese often make the

![Figure 5.1](image-url)
lobster the centerpiece of their banquet. In addition, there is a substantial demand for lobsters during Chinese New Year as lobsters are a traditional dish on Chinese New Year menus (Manser 2011). Hong Kong acts as a highly efficient gateway to Southern Mainland China, and due to the growing economic prosperity, Hong Kong consumers are increasingly demanding more southern rock lobsters.

However, similar to the Western Australia rock lobster industry, a related demand-side factor for Victoria’s lobster fishery has been the pressure from the Hong Kong-based seafood importer/traders for the landed price of the southern rock lobsters to be consistently reduced. This pressure has been driven by a number of significant changes in the supply side of the industry. Firstly, countries, such as South Africa, Cuba, and, more recently, Vietnam, have obtained an increased market share of the Hong Kong lobster import market due to their cheaper prices. Secondly, the pressure on margins has resulted in significant consolidation within Victoria’s southern rock lobster processing sector. Presently, there are only nine licensed processors operating in Victoria, with two exporters/processors holding a highly significant market share; despite, the small number, the sector is extremely competitive.

5.1.2 Which players capture the value?

In effect, lobsters are both a relatively scarce product and a high-end consumer product, and are therefore high priced, premium products when sold in overseas export markets, particularly in Hong Kong. Importantly, there is often a very large difference between the ‘beach price’ in Melbourne and the ‘market price’ in Hong Kong. Despite the small number of rock lobster processors (nine), there is strong competition between the processors to secure product. In addition, the industry is confronting significant competition from rock lobster exporter/processors based in Cuba, Mexico, South Africa and Vietnam.

A critical issue for those airlines participating in the Victoria to Hong Kong rock lobster air freight market is to identify the strategic options necessary to enhance their value capture and delivery. Interestingly, the Victorian-based actors, particularly the exporter/processor, only capture relative small levels of value. The importer/trader based
in Hong Kong is quite a powerful player and is able to charge a premium price for the lobsters in the local Hong Kong and Southern China markets. In the analysis that follows it can be seen that the CX Cargo margin from the transportation of rock lobsters is quite small at around 5-7 per cent. The CX Cargo strategy is to focus on the provision of a highly reliable and efficient airport-to-airport air freight service, supported by state-of-the-art computer systems and high levels of customer service. Similar to the Western Australia to Hong Kong lobster air freight market, the airlines competing for the Victoria to Hong Kong lobster air freight traffic principally compete on the basis of price and also service quality. During periods of high demand for air freight space, such as the Chinese New Year holidays, airlines are able to charge premium prices due to air freight capacity constraints. Also, the case analysis shows that the services provided by Cathay Pacific’s respective aircraft/ramp and air freight handling agents in Melbourne and Hong Kong are highly commoditised with only very minimal service differentiation between the various handling agents competing in both the Melbourne and Hong Kong market segments being evident.

5.2  Mapping the Supply Chain

5.2.1  The functional structure of the chain

The supply chain consists of nine functional stages (Figure 5.2). The chain commences with the rock lobster fishers, then the fisherman’s cooperative, the exporter/processor, the international air freight forwarder, the CTO and ramp handling agent, Cathay Pacific, who transports the rock lobsters to Hong Kong, then the ramp handling agent at Hong Kong Airport, the cargo terminal operator (CTO) and finally the importer/trader.

**Southern rock lobster fishers:** The *southern rock lobster fishers*’ role is to harvest and collect rock lobsters in accordance with their approved individual transferrable quota (ITQ). All rock lobsters are landed live from the catching vessel and are generally purchased by the processor at the wharf (D. Molloy, 2008, Fisheries Victoria, Department of Primary Industries, Queenscliff, pers. Communication, 29 January) or by a fisherman’s cooperative, who then on sells the lobsters to exporters/processors.
Figure 5.2. Key activities in the live southern rock lobster air freight chain from Melbourne to Hong Kong.
Fisherman’s cooperative: The fisherman’s cooperative functions include collecting the rock lobsters from the licensed rock lobster fishers and primarily selling it to the licensed Victorian-based exporters/processors, with other smaller sales made direct to the public. The case study exporter/processor primarily sources their rock lobsters from the various Victorian-based fisherman cooperatives.

Southern rock lobster processing: Southern rock lobster sales activities are conducted by nine Victorian-based rock lobster processors. The primary functions of the rock lobster exporter/processor28 include purchasing/collecting the lobsters from the fisherman’s cooperative (or on occasions purchasing individual rock lobster fishers harvests), grading, preparing and packaging the rock lobster ready for export, deliver the rock lobster consignments to their international freight forwarder ready for carriage, receive and process orders from Hong Kong based importers/traders, and conduct marketing visits to Hong Kong and China to promote their products. Upon delivery of the lobster catches, the processor’s staff sorts the lobsters by size and places them in special holding tanks.

The exporter/processor liaises on a daily basis with their twelve major Hong Kong and China-based clients, and upon receipt of an order, they source the appropriate graded29 lobsters from their holding tanks and place them in polystyrene boxes, which are topped with saw-dust and a frozen gel pack so as to minimize movement thereby reducing potential mortality, and then arrange delivery of the consignment to their international air freight forwarder.

Importantly, the lobster processor’s facilities are designed to cater to the peak demand during the peak lobster production period from December to March with the exporter/processor having made substantial capital investments in processing equipment and capacity in recent years (Informant A, Southern Rock Lobster Exporter).

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28 The Victorian based licensed processors purchase around 90 per cent of the fishery’s annual catch, with the balance sold directly to the public or restaurants (D. Molloy, 2008, Fisheries Victoria, Department of Primary Industries, Queenscliff, pers. communication, 29 January).

29 The company’s southern rock lobsters are graded from Size A to Size F, based on the individual lobster weights. Overseas markets display particular preferences for different size lobsters, hence, the weight grading scale.
Consequently, the peak demand pressures do not require additional facility investments for the processor apart from the general pressure to increase efficiency.

**International air freight forwarding:** The *air freight forwarder* takes delivery of the lobster consignment(s) from the exporter/processor. The key activity undertaken at this part of the chain is the processing and handling of the shipment in accordance with CX Cargo and governmental regulatory requirements in preparation for the air freight transportation to the consignee in Hong Kong. The air freight forwarder provides interim storage for the consignment whilst the handling, airway bill preparation, and the Australian Customs Service (ACS) and Australian Customs Service and Australian Quarantine and Inspection Service (AQIS) approval formalities are completed. The air freight forwarder arranges the required air freight space for their client’s lobster consignments. Upon receipt of the rock lobster consignment from the exporter/processor, the rock lobster cartons are loaded into a Cathay Pacific ULD for the flight from Melbourne to Hong Kong, and are then transported by the international air freight forwarders truck to CX Cargo’s contracted cargo terminal operator at Melbourne Airport. Importantly, the air freight forwarder negotiates the lobster air freight costs from Melbourne to Hong Kong with Cathay Pacific prior to the rock lobster season commencing.

**Cargo terminal and ramp handling operations:** CX’s air freight and aircraft handling operations in Melbourne are handled by a single firm that specializes in aircraft ground and air freight handling services. The company operates a cargo terminal located with Melbourne Airport’s air freight precinct. CX has awarded its import and export air freight handling to the firm. The key functional activities undertaken at this part of the chain are the physical handling of the consignment in preparation for transportation, completion of the governmental regulatory requirements and the handling of CX’s aircraft at Melbourne Airport. The first function that the CTO performs is the acceptance of the consignment from the international air freight forwarder on behalf of their client airlines. At the time of freight tender the CTO check-weighs the shipment and examines the documentation to ensure that it is all in order. Once the CTO is satisfied that the shipment is in order a security examination is conducted in accordance DOTARS air cargo security regulations. When the security clearance is obtained the cargo the shipment is
manifested on the Cathay Pacific flight’s cargo manifest and the details are reported electronically to the Australian Customs Service (ACS). Finally, once the ACS approvals are received and all of the cargo is loaded as booked in accordance with CX’s requirements, the CTO advises the ULD weights and ULD identification details to its aircraft passenger and ramp handling department. The CX flight cargo cut-off time for the acceptance of shipper-loaded ULD’s is two hours prior to the flight’s scheduled departure time. The CTO provides interim storage for the lobster consignments following the cargo acceptance and prior to the ULD’s being transferred to the ramp area for loading onto the CX flight.

The range of aircraft and passenger related handling services provided by the company include the aircraft loading and unloading function, load control and passenger check-in services. Once the cargo is finalized for carriage, the company’s ramp handling staff collects the cargo from their cargo terminal for loading onto the CX’s flights. The company is also responsible for the aircraft weight and balance function (ensuring that aircraft is properly trimmed in accordance with the aircrafts technical limitations); presenting the flight plan and NOTOC to the Captain, and loading all the baggage and cargo onto the aircraft. CX’s outbound cargo destined for Hong Kong is normally loaded onto the aircraft at Melbourne Airport around one hour prior to the scheduled time of departure (STD). Depending upon the number of aircraft containers (ULDs) to be loaded, this process can take around 45-60 minutes to complete. On average, there are around 6-10 staff assigned to the handling of the aircraft. The ramp supervisor is responsible for ensuring that the aircraft is loaded correctly – this includes passenger baggage, cargo and mail. Finally, the company is also responsible for the storage and monitoring of CX’s containers (ULDs) at Melbourne Airport.

**Cathay Pacific Cargo:** CX Cargo performs both marketing and operational functions. As we have noted, under DOTARS air cargo security regulations an airline can only accept cargo from an approved ‘Regulated Air Cargo Agent’ (RACA). Australia’s regulated air cargo agents are primarily International Air Transport Association (IATA) accredited air freight forwarders. The airline therefore issues a tariff to the IATA-accredited international air freight forwarders who act as the intermediary between the airlines and the freight forwarders customers. In order to attract new or additional
business, airlines may also conduct marketing campaigns to promote overseas destinations for exporters. The operational functions performed by CX include allocating air freight space on a nominated flight to international air freight forwarders for the carriage of the client’s air freight consignments; preparing a loading and booking sheet for each flight for use by the CTO, uploading the flight shipment data into the CX Cargo computer system, and billing the air freight forwarder for the carriage of the cargo.

The final part of the supply chain activities takes place in Hong Kong.

**Ramp handling operations:** The final part of the supply chain activities takes place in Hong Kong. This segment commences with the handling of the CX aircraft at Hong Kong International Airport. After unloading all of the air freight from the aircraft, the ramp handling agent provides the ground transportation from the apron area to CX’s contracted CTO, where the Hong Kong import formalities are conducted.

**Cargo terminal operations:** Once the ramp handling agent has transferred the cargo to the CTO then the ULD’s are unloaded by the CTO staff into cages for loading onto the importer/trader trucks. The CTO provides interim storage for the lobster consignment(s) following their receipt at the warehouse facility. The CTO completes the necessary Hong Kong Customs formalities, notifies the consignees of their freight arrival, and delivers the shipment to the consignee once the necessary Hong Kong customs formalities have been finalised. The CTO’s service standard for handling perishable air freight consignments is to have all perishable consignments available for customs/clearance and collection two hours after the actual arrival of the flight in Hong Kong.

**Importer/trader:** The customs clearance of the southern rock lobster consignment marks the first physical activity of the Hong Kong-based importer/trader. The importer/trader subsequently takes delivery of the consignment and stores the lobsters in special holding tanks at their warehouse. The importer/trader also markets/distributes the product in Hong Kong or arranges for the re-export of the lobsters to China. The importer/trader also takes orders for southern rock lobsters from restaurants based in

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30 See Fitzgerald (2005) for a detailed analysis of Hong Kong’s seafood distribution system; and Chung (2007) and Goldman et al. (1999) for a comprehensive overview of Hong Kong’s food retail system.
Hong Kong and Southern China. The main activities performed by the importer/trader are product warehousing, transportation and distribution of the distribution of the rock lobsters to their customers, inventory control, and the marketing and promotion of seafood products.

5.2.2 Corporate ownership in the chain

Figure 5.3 depicts the corporate chain structure and identifies the ownership basis for each chain actor together with their primary business activities. A key feature of this chain is the high degree of governmental regulation, both from a Federal and State level, which the chain actors must comply with in undertaking their operations.

- The lobster processing market

The chain is driven by orders for rock lobsters placed by importers/traders based in Hong Kong. The rock lobster exporter/processor is a privately Australian owned and operated business. Based near the Melbourne Central Business District, the company commenced business in 1995. The company is Victoria’s second largest lobster exporter. The company’s primary business activities include the processing of southern rock lobsters, abalone, Australian fin-fishes and the marketing of these products in key export markets, such as Hong Kong and Southern Mainland China. The company processing facilities include a state-of-the-art export registered processing and packing centre. The company operates a quality assurance program endorsed by the Australian Quarantine and Inspection Service. The company also holds a Registered Export Establishment licence from the Australian Government and complies with both Federal and State government export legislation to ensure that the finest quality products are shipped to overseas markets.

The company’s major lobster export markets are Hong Kong, China, United States of America and Japan/Taiwan. The company also exports smaller volumes to Singapore and domestically within Australia. Hong Kong is the company’s major export market. Hong Kong acts as the gateway to China and around 90 per cent of the lobster
### Chain Actor

<table>
<thead>
<tr>
<th>Ownership Structure</th>
<th>Rock Lobster Fishers</th>
<th>Fisherman’s Cooperative</th>
<th>Exporter/Processor</th>
<th>Freight Forwarder</th>
<th>CTO</th>
<th>Ramp Handling Agent</th>
<th>Airline</th>
<th>Ramp Handling Agent</th>
<th>CTO</th>
<th>Importer/Trader</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% owned by local area fisherman</td>
<td>100% owned private family company</td>
<td>100% owned private family company</td>
<td>Fully owned Australian subsidiary of a major privately owned global logistics firm</td>
<td>Fully owned by a major global publicly listed firm</td>
<td>Publicly listed company</td>
<td>Fully owned subsidiary of Cathay Pacific Airways</td>
<td>Private Hong Kong Listed Company</td>
<td>Privately owned Hong Kong based company</td>
<td>Privately owned Hong Kong based restaurants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Primary Business Activities

<table>
<thead>
<tr>
<th>Number of market players</th>
<th>Harvest rock lobsters in accordance with approved individual transferable quota (ITE)</th>
<th>Purchase lobster fisheries harvesting for on selling to processors and general public</th>
<th>Process lobster for export and domestic sales for market rock lobster and premium Australian finfish</th>
<th>Provision of export and import air and ocean freight handling services</th>
<th>Provision of air freight handling services for client airlines</th>
<th>Provision of airline and air cargo services</th>
<th>Provision of aircraft and passenger handling services</th>
<th>Provision of air freight handling services for client airlines</th>
<th>The sale of rock lobsters to wholesalers and restaurants in Hong Kong and Southern China</th>
<th>Use of rock lobsters in restaurant dishes</th>
</tr>
</thead>
<tbody>
<tr>
<td>131¹</td>
<td>4</td>
<td>9</td>
<td>6²</td>
<td>4</td>
<td>3</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>15⁵</td>
<td>110004</td>
</tr>
</tbody>
</table>

**Figure 5.3.** The southern rock lobster corporate air freight chain structure.

**Notes:**
1. There are 131 licensed vessels authorized to harvest lobsters in Victoria’s Rock lobster fishery, the specific number of fishers is not available in the public domain.
2. There are around 100 air freight forwarders participating in the WA air freight market, out of which six specialize in the handling of perishable air freight cargoes, such as rock lobsters.
3. Informant B estimate.
4. Hong Kong Tourism Board (2010) notes that there are 11,000 restaurants in Hong Kong (number of seafood restaurants is not available).
consignments are re-exported to Southern China\textsuperscript{31} by the company’s Hong Kong-based importer/trader clients. The company also has strong relationships with a number of independent rock lobster fishers and fisherman co-operatives located along the Victoria coastline, who supply the exporter/processor with rock lobsters for processing and export to key international export markets. The company maintains daily contact with their Hong-Kong based importer/traders.

- The international air freight forwarding market

The air freight forwarder is a fully owned subsidiary of one of the world’s oldest and largest air freight forwarding and logistics service firms. The company launched operations in Australia in 1986. The company provides air freight, perishable logistics, sea freight, customs brokerage, contract logistics and consulting and project management services from its offices located throughout Australia: Adelaide, Brisbane, Darwin, Melbourne, Perth and Sydney. The company’s operations are underpinned by a global network of offices and specialist partners, state-of-the-art computerized tracking systems and temperature controlled handling and storage facilities at Melbourne Airport.

The company’s major business activities include the handling of export and import perishable and general cargo consignments, customs brokerage and clearance, provision of specialist advice with regards to packaging and packing, Australian Customs Service and Australian Quarantine Service documentation, warehousing, logistics and product distribution, special projects, and container loading and unloading. The company also provides pressure cooling, re-packing, labeling, loading services, a door-to-door service and arranges sea, air, rail and road transport services on behalf of their clients.

In 2007, the company’s annual air cargo sales revenue was in excess of $AUD 15.0 million placing it among the top 20 international air freight forwarders in Australia. The handling of southern rock lobsters constitutes around 30 per cent of the company’s Victorian branch office gross annual air freight revenue. The company is capable of handling all types of perishable consignments, such as seafood, meat, dairy products and produce lines. The company’s facilities ensure cool-chain management and product

\textsuperscript{31} See Tang (2007) for an overview of China’s seafood market and distribution system.
integrity are carefully maintained. The company’s operations are located close to Melbourne Airport. Forwarder B’s perishable handling facilities consist of temperature controlled handling area, chiller/pressure cooler, refrigerated special handling room and freezer storage totaling around 3,600 m$^3$. The warehouse is both Australian Customs Service and Australian Quarantine Inspection Service (AQIS) approved, with an inspection area for export and import cargoes.

- Cargo terminal operator and ramp handling agent (Melbourne Airport)

Cathay Pacific’s air freight and aircraft ramp handling operations have been contracted to a single service provider who is one of the four accredited cargo and ramp handling agents operating at Melbourne Airport. The company commenced business in Australia in 1998 and is fully owned by one of the world’s largest suppliers of air freight and aircraft ground handling services. The company has established operations in around 27 countries and employs around 14,600 staff (Company Annual Report 2008). In 2008, the company’s aviation ground handling division’s total revenue and profit was $USD 269 and $USD 31.3 million, respectively. The company’s total assets as at the 30 December 2007 were valued at around $USD 95.2 million. Its primary business activity is the provision of passenger, aircraft ground and air freight handling services. The company provides ground handling services for ten major international airlines at Melbourne Airport and holds around 40 per cent of the market, as measured in terms of flights handled (Informant A).

The company earns its revenue from two discrete revenue streams. The first stream comes from their contracted airlines flight handling fees which cover the costs of unloading and loading the aircraft, passenger check-in, baggage services, and other related aircraft operational functions. The second revenue stream comes from their international air freight handling services. The contracted airlines may pay a cargo handling fee, either on a loose per kilogram basis, or on a fixed rate per aircraft turnaround. In addition, the company earns additional revenues from handling charges such as import cargo deconsolidation fees, storage charges, dangerous goods handling and checks and documentation handling fees; these charges are paid by international air freight forwarders on behalf of their clients, and by consignees, in the case of import cargo consignments.
The company’s 5,000 square metre warehouse at Melbourne Airport is a modern and fully mechanized air freight terminal which includes an elevated transfer vehicle (ETV) handling system, multi-level Unit Load Device container and storage system, cool room and freezer facilities, vehicle by-pass lanes, and cargo break-down and build-up areas. The warehouse is both Australian Customs Service and Australian Quarantine Inspection Service (AQIS) approved, with an inspection area for export and import cargoes.

- **International airline (Cathay Pacific Airways)**

Cathay Pacific Airways (CX) is a major Hong Kong based airline that has been in business for over sixty years. At the time of the present study the company had a fleet of 119 aircraft, including 23 dedicated freighter aircraft. The value of CX’s total assets in 2009 were around $USD 14.6 billion. CX is a publicly listed company, with the major shareholders consisting of a major Asian based investment company, holding 41.97 per cent of the shares, a major Asian-based trading conglomerate with a 2.99 per cent shareholding and Mainland China based Air China with a 29.99 per cent shareholding.

Air freight transportation is regarded as a strategic core business activity accounting for around 26 per cent of CX’s total revenue in 2009. CX provides an extensive suite of air freight products including premium time-definite products, perishables products, and airport-to-airport freight services. The airline operates an extensive network of both passenger and dedicated freighter aircraft to North and South Asia, North America, the Middle East, Africa and Europe. In 2009, the airline carried 1.52 million tonnes of air freight, which equated to 8,256 million freight tonne kilometres performed (FTKs). CX was the fourth largest air freight carrying airline in the world (as measured by total FTKs) in 2009 (International Air Transport Association 2010, p. 1).

The air route from Melbourne to Hong Kong is served by ten major airlines (either direct or via a home-based Asian hub). CX, who has served Melbourne for in excess of thirty years, and has traditionally focused on providing a high quality service at a reasonable cost, particularly for southern rock lobster traffic – this has enabled CX to capture a significant share of the southern rock lobster market to Hong Kong. Indeed, the transportation of live
southern rock lobster exports to Hong Kong is regarded as a highly important market for the airline accounting for significant proportion\(^\text{32}\) of the traffic uplifted by CX from Victoria.

‘Live southern rock lobster makes up a significant share of our traffic and due to its high yield, consistency, and value, cargo space is allotted on a priority basis…’. (Airline Informant).

Presently, CX operates 21 scheduled passenger services per week from Melbourne to Hong Kong, with wide-body aircraft, offering around 335 tonnes of available air freight capacity per week. In addition, CX operates two scheduled freighter services from Melbourne to Hong Kong, offering an additional 210 tonnes of available air freight capacity. Therefore, in total CX offers around 545 tonnes of available air freight capacity per week from Melbourne to Hong Kong.

- **Ramp handling agent (Hong Kong)**

CX’s ramp handling services at Hong Kong International Airport are handled by Hong Kong Airport Services (HATS). HATS were established in 1995 and are a fully owned subsidiary of CX. HAS integrated with Hong Kong International Airport Services (HIAS) on 1 November 2008 and is now one of Asia’s largest airport service providers. The company has a workforce of approximately 3,000 and a fleet of 2,600 units of ground servicing equipment. HATS offers a range of airport handling services including ramp handling, transport services, aircraft weight and balance and ramp coordination. The company provides passenger handling for 13 airlines, and ramp and air freight handling services for 37 airlines and held a 55 per cent market share of air traffic movements in 2008 (Hong Kong Airport Services 2009, p. 2).

HATS are a member of the International Air Transport Association (IATA) Ground Handling Council and attained AHM 804 accreditation from IATA in 2000. The company earns its revenue from their contracted airlines flight handling fees. These fees cover the

\(^{32}\) Due to confidentiality reasons, the actual percentage was not revealed by the informant. However, the informant noted that the percentage of lobster traffic uplifted on CX’s flights from Melbourne was ‘extremely significant’.
costs of unloading and loading the aircraft, passenger check-in, baggage services, and other related aircraft operational functions.

- **Cargo terminal operator (Hong Kong)**

The sixth chain actor is CX’s cargo terminal operator at Hong Kong International Airport. The CTO, a privately listed company, is one of the two franchised air cargo terminal operators located at Hong Kong International Airport (Airport Authority Hong Kong 2008, p. 2). The company, which has been in business for over twenty five years, employs over 2,400 staff and provides a range of services, including physical freight handling, freighter aircraft handling, air cargo documentation handling, and logistics support services. The company’s total assets are estimated to be in excess of $HKD 8 billion.

The company is jointly owned by seven major firms. Shareholder A, a large international private company with diversified interests in transportation, real estate, industrial construction, shipping and logistics, port terminal operations and other associated services holds 25 per cent of the company’s stock. The second largest shareholder, with 20 per cent of the shares, is a major corporation listed on the Hong Kong Stock Exchange, with diversified interests in five operating areas: aviation, beverages, marine services property and trading and industrial. Shareholder C, with 12.5 per cent of the company’s shares, is also a major Hong Kong Stock Exchange listed company, with five core business areas: ports and related services, property and hotels, retail, energy, infrastructure, investments and others, and telecommunications. Shareholder D also holds 12.5 per cent of the company’s shares. The company is also listed on the Hong Kong Stock Exchange, with three core business activities: communications, media and entertainment, property development and property rental, and an investment division. Shareholder E, a diversified corporation listed on the Hong Kong Stock Exchange, whose business activities cover seven core areas: aviation, civil infrastructure, communications, energy, marketing and distribution, property and special steel, holds 10 per cent of the company’s shares. The final 20 per cent of the company’s shares are held by a major Asian-based international airline (Shareholder F) with a 10 per cent share holding and a Mainland China-based airline (Shareholder G) with a 10 per cent shareholding.
In July 1998, the company opened its $USD 1 billion cargo terminal, the largest in the world, at Hong Kong’s new international airport; the cargo terminal has the capacity to handle up to 3.5 million tonnes of cargo per year.

The company earns its revenue from air waybill documentation and cargo handling fees which are payable on all shipments handled, and also storage fees for cargoes that are not customs cleared and delivered within 48 hours of the freight’s arrival in Hong Kong. Additional revenues are earned from its scheduled under-bond road transportation services to Southern Mainland China. The CTO has a large client base consisting of over 90 airlines (scheduled airlines and all-cargo operators). In 2009, the company handled a total of 2.32 million tonnes of air freight.

- **Hong Kong’s rock lobster/seafood import/trading market**

The final company in the chain is the Hong Kong based importer/trader, a privately owned company that has been in business for 5 years, and employs around 15 staff. The company specializes in the importation and distribution of lobster and other seafood products from around the world. The company supplies lobsters to the local Hong Kong restaurant market and also re-exports lobsters to Southern China, in particular, the Shenzhen area. The company has offices in both Shenzhen and Hong Kong and its annual turnover is around $USD 5 million.

### 5.2.3 Contractual relationships and chain structure

Figure 5.4 depicts the pattern of contractual relationships in the chain; but it also shows that the important interfaces between the exporter/processor, the rock lobster fishers, the fisherman’s co-operative and the Melbourne-based international air freight forwarder, on the one hand, and the importer/trader and CX on the other, are managed within the framework of operating rather contractual relationships. As we have noted, this is not necessarily a problem, but it has the potential to permit the inequitable transfer of cost inefficiencies between actors (Robinson 2007b, p. 95).
The key operating link is, of course, that between the seller and the buyer – the Hong Kong based importer/trader. The sale agreement may specify the terms of trade under which the southern rock lobster is shipped and, in so doing, specify which actor bears the costs and insurance (Robinson 2007b, p. 95). In this case study, all live southern rock lobster exports are shipped on a cif basis from Melbourne to Hong Kong.

The rock lobster exporter and the air freight forwarder have a close and collaborative operational relationship. Under this agreement, both parties have agreed to specific handling and logistical arrangements to ensure that the rock lobster export shipments move in a timely and efficient manner to Hong Kong. The relationship is underpinned by the air freight forwarders ‘terms of trade’, which specify credit limits and payment terms.

![Diagram](image)

**Figure 5.4.** The contractual relationships in the southern rock lobster air freight chain from Melbourne to Hong Kong.
Figure 5.4 indicates that the air freight forwarder does not have any formal contractual agreements with CX Cargo; rather the two parties work closely together on an operational basis only. Importantly, the international air freight forwarder has negotiated dedicated air freight space allotments with CX Cargo on their services from Melbourne to Hong Kong to accommodate their client’s rock lobster consignments. The air freight forwarder and CX’s CTO at Melbourne Airport, dealings are conducted on a shipment by shipment transactional basis.

The Hong Kong International Airport-based CTO and ramp handling agent also conduct business on an operational basis only. The Hong Kong-based importer/trader business relationships with both CX and CX Cargo’s contracted Hong Kong based CTO are conducted on a shipment by shipment transactional basis.

The contractual linkages in the chain are those between CX and its CTO and ramp handling agent at Melbourne Airport and its ramp handling agent and CTO located at Hong Kong International Airport. Cathay Pacific’s air freight and ramp handling contracts in both Melbourne and Hong Kong are based on the International Air Transport Association (IATA) ‘Standard Ground Handling Agreement (SGHA)’ document. Cathay Pacific also has contracts with Australia Pacific Airports Corporation and the Airport Authority Hong Kong, which formalizes the terms and conditions for airlines operating services to their respective airports. Finally, the Hong Kong-based ramp handling agent and CTO operators have franchise contracts with the Airport Authority Hong Kong which authorizes these companies to provide services at the airport (Airport Authority Hong Kong 2008, p. 2).

### 5.2.4 Regulations and chain structure and dynamics

The first section of this case study has mapped and described the functional, corporate and contractual linkages in the chain. Before proceeding with the analysis of the value chain it is necessary to review the government regulatory influences on the southern rock lobster fishery as these place significant constraints on the various chain actors. The following section also briefly examines the Australia/ Hong Kong air services agreement

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33 See Appendix 4 for an overview of the Australian and Hong Kong Government regulations applicable for the actors participating in the Victoria to Hong Kong air freight market.
(ASA) as this agreement specifies the number of airline services that can be operated between the respective countries, and hence, the strategies that airlines define to serve this important market.

- **Resource Management and Sustainability**

The Victorian Government has jurisdiction over the commercial rock lobster fishery in the Commonwealth of Australia waters adjacent to Victoria under an Offshore Constitutional Arrangement (OCS) with the Federal Government (Department of Primary Industries 2008, p. 8).

Victoria’s rock lobster fishery is managed by Fisheries Victoria, a Division of the Department of Primary Industries (DPI), under the 1998 proclaimed *Fisheries Act 1995* (Fisheries Co-Management Council 2005, p. 13), the *Fisheries Regulations 1998* and the *Victorian Rock Lobster Fishery Management Plan 2002* (RLFMP). Importantly, the goals of Victoria’s Rock Lobster Fishery Management Plan include the objective of recovering lobster stocks to a level that would have a spawning output equivalent to 40 per cent of that estimated for 1951 (Punt et al. 2006, p. 503).

- **Southern rock lobster fishery management controls**

Victoria’s southern rock lobster fishery is principally managed via output controls through a limited number of commercial access licenses allocated between two discrete zones, a total allowable commercial catch (TACC) divided into individual transferable quota units (ITQs), and a quota management system (QMS) (Department of Primary Industries 2003a, p. 3). The fishery is also managed by a number of input controls including legal minimum lengths (LMLs), closed seasons, restricted pot numbers and fishing gear regulations that specify the size of rock lobster pots and escape gaps (Hobday and Ryan 1997, p. 1009).

Victorian legislation also determines the legal minimum length (LML) of capture and therefore the size of the rock lobster to the fishery. The size limits of rock lobsters is defined by the carapace length (CL) and measured from the front edge of the groove between the large antennae to the nearest part of the rear edge of the carapace. The LML
is 110 millimetres for males and 105 millimetres for females (Treble et al. 1998, pp. 291-292).

Victoria’s rock lobster industry quota management system (QMS) is based on telephone and written records. Rock lobster fishers are required to provide detailed daily catch information in a daily catch log. In addition, they must report the number of rock lobsters caught for the day by phone while still at sea via an Integrated Voice Response (IVR) system within a specified minimum period prior to entering one of the 25 specified ports or mooring areas in Victoria (Australian Government, Department of the Environment and Heritage 2004, p. 14).

Following landing, the catch must be weighed and reported to Fisheries Victoria within 20 minutes. Catch disposal records must be completed prior to any rock lobsters being sold or leaving the landing site. Catches, boats, “coffs” and completed documentation are inspected regularly by Fisheries Victoria officers. Daily catch records must be submitted to the Department of Primary Industry on a monthly basis (Department of Primary Industries 2003a, p. 6).

- **Southern rock lobster harvesting season**

The fishing season in Victoria’s southern rock lobster fishery runs from November to August, with an annual closed season for females from 1 June to 15 November, and for males between 1 September and 15 November (Hobday et al. 2005, p. 675).

- **Southern rock lobster fishery boundaries**

Victoria’s rock lobster fishery is divided into the Eastern and Western zones (Figure 5.4) (Bradshaw et al. 2001, p. 75) so that the spatial nature of the stock can be better managed (Department of Primary Industries 2007, p. 1). The Western Zone (WZ) extends west to the South Australian border at longitude 140°57.9’E and southward to latitude 40°S. The Eastern Zone (EZ) extends east to the NSW border at latitude 39°12’S (Figure 5.5) (Department of Primary Industries 2003b, p. 5). More than 85 per cent of Victoria’s annual

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34 License holders using coffs are required to maintain a register of the number, time, date and transfer of rock lobsters (Department of Primary Industries 2003a, p. 6).
lobster catch is taken from the Western zone, where there are extensive areas of offshore reefs (Seafood Industry Victoria 2004, p. 1).

![Figure 5.5. Victoria’s southern rock lobster fishing management zones. Source: Department of Primary Industries (2003b, p. 6). Figure used with permission of Fisheries Victoria, Department of Primary Industries.](image)

- **Commercial Access and Quota Management**

The instrument for managing access to Victoria’s rock lobster fishery (VRLF) is the Rock Lobster Fishery Access License (RLFAL). Rock lobster fishing entitlements are based on the legal ownership of RLFAL owners to quota holdings and pot entitlements as defined in the *Fisheries Act 1995* (Vic). The RLFAL specifies the licence holder, operator, boat, pot entitlement and zone (Townsend 1990, p. 366). The license entitles the holder to use rock lobster pots to take rock lobster and fish for sale within their quota allocation (Department of Primary Industries 2003a, p. 5).

RLFALs, quota holdings and pot entitlements are connected but may be traded independently within each zone of the fishery. However, the ownership of quota units in the rock lobster fishery remains with RLFAL holders (Department of Primary Industries 2003a, p. 5).
In 2007, there were 139 RLFALs, of which 54 licenses (2,021 pots) in the Eastern Zone, and 85 licenses (5,147 pots) in the Western Zone (Department of Primary Industries 2007, p. 1). Each licensed rock lobster fisher vessel has a maximum number of rock lobster pots – 140 and 120 pots in the Western and Eastern Zone, respectively – that it is authorized to carry based on length of the vessel (Department of Primary Industries 2003a, p. 22). There are 7168 pots distributed throughout the fleet (Department of Primary Industries 2007, p. 1).

A licence holder is permitted to employ an operator to work the licence. Licences are not replaced when cancelled by a court or removed from the fishery through such mechanisms such as non-renewal or merger. RLFALs remain fully transferrable (Department of Primary Industries 2003a, p. 21).

An annual TACC is determined for each zone, and is divided into ITQ units. The TACC is divided amongst 4,000 quota units in the Western Zone and 1,000 quota units in the Eastern Zone. Upon the annual renewal of the RLFAL, a quota notice is issued with the ITQ units owned by each licence holder. Only RLFAL holders are entitled to own ITQ units. A licence holder may apply to the Department to transfer ITQ units to another RLFAL holder within the same zone. ITQs may be transferred permanently, or for a defined quota period.

RLFAL holders are authorized to own quota within pots, but to operate in the fishery, active licences must have a minimum of 20 pots in the Western Zone and 15 pots in the Eastern Zone (Table 5.1). The RLFAL does not specify the maximum number of pots applicable in either zone. However, the maximum number of pots that can be worked from a single boat is 140 and 120 pots in the Western and Eastern Zones, respectively (Department of Primary Industries 2003a, pp. 21-22).
Table 5.1. Summary of Victorian Southern Rock Lobster Fishery Licensing Arrangements.

<table>
<thead>
<tr>
<th></th>
<th>Eastern Zone</th>
<th>Western Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Licenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum number of licenses</td>
<td>54</td>
<td>85</td>
</tr>
<tr>
<td>Maximum number of licenses per boat</td>
<td>No maximum</td>
<td>No maximum</td>
</tr>
<tr>
<td><strong>Pots</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of pots in 2007</td>
<td>2021</td>
<td>5147</td>
</tr>
<tr>
<td>Maximum pots on a license</td>
<td>No maximum</td>
<td>No maximum</td>
</tr>
<tr>
<td>Maximum pots per boat</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>Minimum pots on a licence</td>
<td>No minimum</td>
<td>No minimum</td>
</tr>
<tr>
<td>Minimum pots to activate a licence</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Quota</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum quota holding</td>
<td>No maximum</td>
<td>No maximum</td>
</tr>
<tr>
<td>Minimum quota holding</td>
<td>5 units</td>
<td>10 units</td>
</tr>
</tbody>
</table>

Source: Department of Primary Industries (2003a, p. 21). Figure used with permission of Fisheries Victoria, Department of Primary Industries.

The number of boats authorized to operate in the fishery has been capped under a system of limited entry introduced in 1968 (Seafood Industry Victoria 2004, p. 1).

- **Licensing of Rock Lobster Processors**

There is presently no requirement for a processing licence or catch records in Victoria’s southern rock lobster industry. However, the signed catch disposal records with confirmation numbers must accompany the rock lobster when they are transferred from the point of landing to where they are sold (Department of Primary Industries 2003a, p. 6).
• **International airline services**

In 2004, the Australian and Hong Kong Governments ratified a substantially liberalized ASA (Ionides 2004, p. 40). The ASA authorized 70 weekly passenger flight frequencies between the two countries and provided for a completely open regime between Hong Kong and all regional points in Australia, including Adelaide and Cairns; and authorized Australian-based airlines to operate a total of seven services per week beyond Hong Kong to the United Kingdom (Campbell 2004, p. 1; Fung 2004, p. 1).

### 5.3 Mapping the Value Chain

Having established the stages and structure of the physical supply chain and the appropriate governmental regulations that apply to the chain actors, we can now focus our attention on analyzing the flow of value running back through the chain from the end customer. There are two key tasks to be completed. First, the share of total revenue captured at each stage of the chain needs to be ascertained. Second, the profit margins being earned by the actors at each stage of the chain also need to be documented. The data presented in the next section are based on the case interview survey data, and supported, where possible, from the participating firm’s annual reports and other peak industry body and government reports.

#### 5.3.1 Chain margins and revenues in the chain

The revenue shares in the chain are presented in Table 5.2. As Table 5.2 reveals, 54 per cent of the revenues within the chain are accounted for in the catching / processing stage of the chain. Forty five per cent of the cost of the raw material is brought in by the exporter/processor from the upstream supply chain stage – the southern rock lobster fishers and the fisherman’s cooperative. This is an important point, because the supply market that the exporter/processor is purchasing within is problematic. Either there are few suppliers (rock lobster fishers), or, where there is strong competition in the market, there are high switching costs associated with abandoning an existing supplier.
The traditional business approach of the fishers and exporters/processors has typically been based on the exploitation of a wild seafood resource accessed on a seasonal basis by licensed operators. The ‘hunter/gatherer’ approach that has developed in the industry places the highest priority and financial investment in countering the associated risks associated with fish supply, that is, fishery access via a license and the relative productivity of the harvest operation. The beach price has become uncontrollable.

Consequently, this has fostered a commodity culture that is essentially technology and catch productivity driven. Furthermore, the culture of many actors is driven by commodity opportunism in an environment where currency risks are high, supply/processing contracts are not utilized, beach trading rules encourage short term planning, and customers are price makers.

### Table 5.2. Revenue and gross profit margins in the lobster air freight value chain from Melbourne to Hong Kong.

<table>
<thead>
<tr>
<th>Lobster Fishers</th>
<th>Fishermans Co-operative</th>
<th>Exporter</th>
<th>Freight Forwarder</th>
<th>Aircraft/Cargo Handler</th>
<th>Airline</th>
<th>Ramp Handling Agent</th>
<th>CTO</th>
<th>Importer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical gross profit margin (ROS %)</td>
<td>20</td>
<td>25</td>
<td>50</td>
<td>10-15</td>
<td>7-10</td>
<td>7</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Typical distribution of revenue for the chain actors (%)</td>
<td>38</td>
<td>7</td>
<td>9</td>
<td>5</td>
<td>0.5</td>
<td>10</td>
<td>0.25</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Source: Case interview data and comprehensive survey of annual company and industry reports.

In addition, the southern rock lobsters fishers’ principal focus on harvesting has traditionally meant that many fishers trade control and margin potential away to third parties at the beach or the door of the processing organization. Consequently, fishers, and on occasions exporters/processors, tend to have a very limited appreciation of market requirements. These actors are locked into a supply approach which makes them relatively weak sellers into commodity markets. Their motivation to clearly comprehend consumer preferences and then enhance sales margins through joint value-adding throughout the supply chain is minimized. This then precludes fishers from achieving
better value-adding opportunities and better returns (Australian Southern Rock Lobster 2003, pp. 4-5).

Similar to the western rock lobster industry, fluctuations in southern rock lobster supply have an impact on prices received within a given season. More than 95 per cent of rock lobsters caught in Victoria are exported to major markets in South East Asia, such as Hong Kong and China, Japan, with smaller volumes exported to the United States. This means the industry is highly vulnerable to fluctuations in the Australian dollar against the United States dollar. Because most of the South-East Asian countries are linked to the United States dollar, trading in Asia is essentially trading in United States dollars. As the Australian dollar strengthens or weakens against the United States dollar, this has a most important impact on the trade in Asia (Western Rock Lobster Council 2007a, p. 18) in terms of the landed prices/costs in Hong Kong. This situation is an extremely influential factor in the management of the chain.

- **Southern Rock Lobster Fishers**

In Victoria’s rock lobster fishery, fishers have two methods for selling their lobster harvests: via fisherman’s cooperatives or sell directly to rock lobster exporter/processors. Importantly, the catching, fisherman’s cooperatives and processing sectors of Victoria’s rock lobster fishery are mutually dependent upon the other. The processing sector is reliant upon the fishers and the fisherman cooperatives to supply rock lobsters in first class condition. Conversely, the fishers relies upon the processing sector to provide high quality processing of lobsters and sales to major world markets as well as providing support services, that is, bait and other essential fishing requirements (Bowen 1994, p. 7). Despite this inherent mutuality, southern rock lobster fishers are constrained by governmental regulation with regards to the volume of southern rock lobsters that they can catch and also the predetermined period (the season), which specifies the times of the year when they are authorized to fish for lobsters.

The rock lobster fishers are also affected by the changing demand for certain lobster products, the time of the year including the season in the consuming country and the proximity to national festivals or special days, the change of the lobster colour and catch weight changes. In addition, the value of the lobster product is influenced by selling prices,
exchange rates and weight loss (otherwise known as yield or recovery) and the variable processing costs (Informant A, Exporter/Processor). These factors when taken together significantly influence the margins which can be earned by lobster fishers, the net margins at this stage of the chain are around 10 per cent.

- **Fisherman’s Cooperative**

The margins at this stage of the chain are around 7-8 per cent as the buyer (fisherman’s cooperative) has a long-standing and strong, but cooperative, position vis-à-vis the rock lobster fishers (suppliers). In addition, the fisherman’s cooperative also has a close and collaborative relationship with the exporter/processor and this enables the fisherman’s cooperative to also earn a margin of around 7-8 per cent from their commercial exchange relationship.

- **Rock Lobster Exporter/Processors**

The rock lobster price varies according to catch and market conditions. In general, the fishers set a beach price on a daily or weekly basis. In situations where the exporter/processors deal directly with the rock lobster fishers then the processor pays for the product at the beach price and then needs to market the processed product at a higher price in Hong Kong so as to earn a profit margin. The processor however confronts strong competition in Hong Kong from Vietnam, Mexico, and South Africa.

Despite the small number of authorized Victorian-based processors (9) due to the highly competitive nature of the industry, the net margins at this stage of the chain are around 5 per cent. The ability of the exporter/processor to differentiate their products and build switching costs into the relationship are difficult due to the homogenous nature of the raw material, southern rock lobster. Under such circumstances, the primary strategy for earning above average profits will be for the firm to develop to a more customized service offering and to develop a superior productive capability (Cox et al. 2002, p. 154) and also seek alternative or new markets to enable economies of scale to be developed and to reduce the reliance on the Hong Kong market.
• **International Air Freight Forwarder**

The margins at this stage of the chain are around 7-8 per cent as the rock lobster exporter/processor has a strong, but cooperative, position *vis-à-vis* the supplier (international air freight forwarder).

• **Cargo Terminal Operators – Melbourne and Hong Kong**

These firms offer highly standardized commodities. There is little that these firms can do to differentiate their products to build switching costs into the business relationships with their clients. Under these circumstances, the main method of earning above average profits will be to develop to a more customized service offering and to develop a superior productive capability (Cox et al. 2002, p. 154). There is evidence of this strategy being employed by the CTO in Hong Kong who now provides an extensive range of value-added services, such as, export consolidation, and a range of trucking services. Even this, however, is unlikely to take a cargo-handling agent beyond the industry average margin of 5-7 per cent.

• **Ramp Handling Agents – Melbourne and Hong Kong**

Similar to the cargo terminal operators these firms offer highly standardized services. Thus, it is difficult for these firms to differentiate their products in order to build switching costs into the business relationships with their clients. Under these circumstances, the main method of earning above average profits will be to develop to a more customized service offering and to develop a superior productive capability (Cox et al. 2002, p. 154). Even this, however, is unlikely to take a ramp-handling agent beyond the industry average margin of 5-7 per cent.

• **International Airline (Cathay Pacific Cargo)**

The margins at this stage of the chain are around 5-7 per cent as CX Cargo and Forwarder B have a strong, and cooperative commercial exchange relationship. Potentially, Cathay Pacific Cargo could enhance its value capture through the
differentiation of its service offerings, through the addition of value-added logistics service solutions.

- **Hong Kong Based Importer/trader**

The margins at this stage of the chain are around 10 per cent as the buyer (importer/trader) has a strong, long-standing and cooperative, relationship with the Melbourne-based exporter/processor. Nonetheless, the importer/trader has multiple markets to source lobster products from, for example, South Africa and Vietnam, and therefore, can leverage the competitive nature of Hong Kong seafood import market to sustain the company’s margins vis-à-vis potential suppliers.

Finally, when analyzing the flow of value (Figure 5.6) along the live rock lobster air freight chain, Figure 5.6 shows us that the distribution of value between the chain actors is reasonably equitable.

**Figure 5.6.** Net returns in the lobster air freight chain from Melbourne to Hong Kong. Source: Researcher’s estimates based on comprehensive survey, interview data and company and industry reports.

**Key:** CO-OP= Fisherman’s Co-operative; CT = CTO; EP = Exporter/Processor; FF = International Air Freight Forwarder; IA = International Airline (Airline Z); IT = Importer/Trader (Hong Kong-based); RH = Ramp Handling Agent; RLF = Rock Lobster Fisher(s).

The Hong Kong based importer/trader and the international air freight forwarder appear to earn more than CX Cargo, and the Melbourne-based cargo terminal operator and the aircraft ramp handling agents at Melbourne and Hong Kong airports. The importer/trader
and the southern rock lobster fishers’ make an average net profit margin of around 10 per cent compared to 5-7 per cent for CX Cargo. The exporter/processor typically operates on a gross profit margin of around 50 per cent. However, this margin is generally absorbed by their high fixed costs, resulting in a net margin of around 5 per cent (Exporter/Processor Informant A). Significantly, the profitability of the rock lobster fishers and processors is complicated by the inherently cyclical nature of profitability in the industry.

**5.3.2 Value capture and the competitive dynamics of exchange**

There are twelve major commercial exchange or dyads present in the air freight value chain for southern rock lobsters from Melbourne to Hong Kong. The competitive exchange dynamics for each of these dyads, and the wider interrelationships between them, are illustrated in the network model shown in Figure 5.7. The nature of these competitive dynamics, and the resultant distribution of value in the network, depends on the power structures of the individual actors.

These power structures are represented using the nomenclature discussed in Chapter 2. To recap briefly, buyer power is indicated by the symbol (>) , supplier power by (<), buyer-supplier interdependence by (=), and buyer-supplier independence by (0) (Cox et al. 2002, p. 93).
Figure 5.7. The power regimes for the southern rock lobster air freight chain from Melbourne to Hong Kong.

**Key:** A = Rock Lobster Fisher(s); B = Fisherman’s Cooperative; C = Exporter/Processor; D = International Air Freight Forwarder; E = Cargo and Ramp Handling Agent (Melbourne Airport); F = Cathay Pacific Cargo; G = Ramp Handling Agent (Hong Kong); H = Cargo Terminal Operator (Hong Kong); I = Importer/Trader (Hong Kong).

- **Rock lobster fishers and fisherman’s cooperative**

The first of the twelve commercial exchange dyads is that between the rock lobster fishers (A) and the fisherman’s cooperative (B). Whilst Victoria's rock lobsters are highly regarded in Hong Kong, the price-setting ability of southern rock lobster fishers is heavily influenced by variations in the supply of rock lobsters, world exchange rates and other global events.

Moreover, only licensed exporters/processors are permitted to export southern rock lobsters from Victoria to overseas markets. Consequently, rock lobster fishers have two options available to them when selling their catches. Firstly, as in the present case, sell the rock lobsters to a fisherman’s cooperative who then takes the responsibility for finding a buyer for the catch. Alternatively, rock lobster fishers can attempt to deal with the exporters/processors directly.

In this particular chain the rock lobsters are bought wholesale by the fisherman’s cooperative for on-selling to exporter/processors for subsequent processing. A major element of the costs of doing this is the ‘beach price’ of the raw material (southern rock lobsters). These costs are set by the rock lobster fishers on a daily basis. The commercial
dyadic exchange relationship between the southern rock lobster fishers’ and the fisherman’s cooperative is represented in Figure 5.7 as \( A = B \), which means that these actors conduct business under conditions of structural interdependence. This occurs because there are few buyers and few suppliers, the supplier is dependent on the buyer for revenue with few available alternatives, the search costs for the buyer are low, the buyer’s account is attractive to the supplier, and the suppliers offering is relatively unique (Cox et al. 2007, p. 325).

- **Fisherman’s cooperative and processors**

Victoria’s rock lobster fishery is heavily regulated and is therefore a very restricted one. There are only nine licensed processors in the market, with the two largest processors holding a significant market share. The barriers to entry are very high. There are also low buyer search costs as customers are very knowledgeable. Due to the nature of their operations, the buyers have a very good understanding of the fisherman’s cooperative operations. Hence, the exporter/processors possess significant power resources. Consequently, the fisherman’s cooperatives only have a small number of firms licensed to purchase the rock lobsters that the cooperatives have bought from the individual rock lobster fishers.

Once these two sets of power resources are combined together, we can see that the dyad is characterized by a condition of interdependence. This position of interdependence is recognized by both actors on a day-to-day basis. The fisherman’s cooperative recognizes the need for the processor to have sufficient funds to invest in new technologies that will reduce costs. Furthermore, the fisherman’s cooperative recognizes that a close relationship with the exporter/processor is mutually beneficial. The export/processor is one of Victoria’s largest rock lobster exporters and their end-customers are extremely price-sensitive; therefore it is in the interests of the fisherman’s cooperative to assist the exporter/processor in reducing costs.

The exporter/processor shares a similar attitude. It is essential to the processor that the importer/traders in Hong Kong continue to purchase the firm’s products. The Hong Kong seafood market is extremely competitive, and the processor faces strong international competition. It is therefore essential that the exporter/processor reduces costs, so that
effective demand is increased. Rock lobsters represent the most part of the processors business annual turnover. Success in this supply chain is of strategic importance, therefore, to the firm at large (Cox et al. 2002, p. 157).

Thus, the power attributes of the buyer and supplier are as follows: there are few buyers (only nine authorized processors operating in Victoria), with few suppliers (fisherman’s cooperatives); the buyer may have a large, but not necessarily the total, share of the fisherman’s cooperative sales; both the supplier and buyer switching costs are relatively high (in terms of perceived risks of finding either a new buyer and appropriate supplier); the fisherman’s cooperative finds the buyers account highly attractive; the search and transaction costs to find alternative suppliers are relatively low for the buyer; and the supplier has potential product information asymmetries against the buyer (knowledge of where to source product that conforms to end-user requirements) with the exporter/processor (Cox and Chicksand 2005, p. 659).

- **Exporter/processor and air freight forwarder**

We turn next to the exchange relationship between the exporter/processor (C) and the international freight forwarder (D). The relationship is represented in Figure 5.7 as (C = D), which means that these companies conduct business under conditions of structural *interdependence*. This is because the exporter/processor works closely with the international air freight forwarder who arranges the transportation requirements on the processors behalf. Their relationship is very close and collaborative.

As noted previously, Australia’s international air freight market is highly regulated by DOTAR’s and the International Air Transport Association and is therefore restricted to those companies that satisfy their stringent requirements. There are around one hundred authorized international air freight forwarders operating in the Melbourne market. There are six major international air freight forwarders specializing in the handling of perishable cargoes. The barriers to entry are quite low. There are also low buyer search costs as customers are very knowledgeable. Due to the nature of their operations, the exporter/processors have a very good understanding of the international air freight forwarders service offerings.
Notwithstanding, the international air freight forwarder also possesses significant power resources. Forwarder B has extensive experience and expertise in handling perishable cargoes, has strong relationships with the airlines serving the Melbourne market, and access to state-of-the-art IT systems and warehouse facilities. Forwarder B’s net profit margin is around 8 per cent.

Therefore, the power attributes of the buyer (exporter/processor) and the supplier (international air freight forwarder) are as follows: there are few buyers (exporter/processors), with one or more supplier (international air freight forwarders that have the facilities and expertise to handle highly perishable and valuable southern rock lobster consignments); the buyers (exporter/processors) may have a large, but not necessarily the total, share of market sales for the supplier; both the exporter/processor and international air freight forwarder switching costs are relatively high (in terms of perceived risks of finding either a new buyer and appropriate supplier); the supplier (international air freight forwarder) finds the buyer’s (exporter/processors) account attractive but the buyer highly values the supplier’s expertise, market knowledge and contacts; the search and the related transaction costs to locate alternative international air freight forwarders are relatively low for the buyer (exporter/processors); and the services provided by the international air freight forwarder are relatively standardized with some information asymmetry advantages for the supplier (international air freight forwarder) (Cox et al. 2006, p. 7).

- **Exporter/processor and the Hong Kong-based importer/trader**

The next dyadic relationship in the network is between the exporter/processor (C) and the importer/trader located in Hong Kong (I). The relationship is represented in Figure 5.7 as (I > C), which means that these companies conduct business under conditions of *buyer dominance*. The net profit margins typically earned by Hong Kong-based seafood importers/traders are quite low in this commoditized exchange. Net margins of 10 per cent are typical. In a commodity market situation, rival suppliers are typically differentiated based on price, and the buyer is able to switch suppliers with relative ease and at little or no cost should a more favourable deal emerge. Furthermore, the importer’s search costs are quite low, because rock lobster products are relatively homogenous. Together, these
factors mean that the exporter/processor is forced to value to the importer/trader, in the form of price reductions, simply to retain his or her custom (Cox et al. 2002, pp. 93-94).

Hence, the Hong Kong-based seafood importers/traders normally possess buyer dominance when they source commoditized products that are sold on a price basis relative to a given quality standard. This is because they have the following key power levers over suppliers: there are few buyers (Hong Kong-based importer/traders), with many potential suppliers, not only located in Australia, but also in Vietnam, Mexico, South Africa and Cuba; the importer/trader’s business volumes are high relative to the supplier’s annual business turnover and the buyer’s account is very attractive to the supplier for revenue; the exporter/processors switching costs are high, those of the buyer are relatively low; the supplier (exporter/processor) offerings are standard and commoditised; the buyer (importer/trader) search costs are low; and information asymmetry favours the buyer (importer/trader).

- **Air freight forwarder and cargo terminal operator**

The commercial exchange relationship between the air freight forwarder and the cargo terminal operator (CTO) located at Melbourne Airport is represented in Figure 5.7 as (D = E), which means that the two parties conduct business under conditions of structural interdependence (=). This is because there is a high level of supplier scarcity, a relatively high level of buyer scarcity, and low search costs for the buyer (air freight forwarder). As we discussed earlier, the cargo handling market at Melbourne Airport is a very restricted one. There are only four firms in the market. The barriers to entry are very high, especially given the small volumes that currently characterize the market, and the high degree of governmental regulation that needs to be satisfied. There are also very low buyer search costs. Despite the small number of CTO’s operating in Melbourne, the service offering of the various firms is basically the same. Despite its significant market share, the CTO is unable to premium price their service, because they are still in competition with their competitors, and volumes are relatively small. Net profit margins are around 5-7 per cent.

It is essential to the CTO that Freight Forwarder B continues to purchase its services. International air freight forwarders represent the major part of CTO’s business annual turnover. In addition, air freight forwarders’ are extremely knowledgeable customers. Due
to the nature of their business, these firms have a very good understanding of the Melbourne air freight market. Thus, the CTO is selling a specialized service, but commoditized offering, to a relatively concentrated and well-informed customer base. Nevertheless, the CTO also possesses significant power resources. The CTO effectively operates in a competitive supply market, holding around 30 per cent of the market-share, and more particularly, handling several of the major airlines serving the Melbourne international air freight market. Consequently, Forwarder B has nowhere else to go to access CX Cargo services. In addition, due to the highly specialized services provided by the CTO, Forwarder B would not want the market leader to exit the market.

When the two sets of power resources are combined together, we can see that this exchange dyad is characterized by a condition of structural interdependence. Forwarder B is one of Victoria’s largest international air freight forwarders and due to the volume of business the company works closely with the CTO (D) to ensure that the CTO satisfies its handling requirements in an efficient manner. Their relationship is therefore quite close and collaborative. Hence, this state of interdependence is recognized by both actors on a day-to-day basis. This is because the power attributes of the buyer and supplier can be summarized as follows: there are few buyers, with only four Melbourne Airport based cargo terminal operators (suppliers); Forwarder B may have a large, but not total, share of market revenue for the CTO; the CTO finds Forwarder B’s account attractive and Forwarder B highly values the CTO knowledge and experience in handling cargo; the CTO’s service offering is relatively unique; and the CTO may have some moderate information asymmetry advantages over Forwarder B (Cox and Chicksand 2005, p. 656).

- **Air freight forwarder and Cathay Pacific Cargo**

The dyadic relationship between the Melbourne, based air freight forwarder (D) and CX Cargo (F) is represented in Figure 5.7 as (D = / > F), which means that these companies conduct business under conditions of interdependence (=) or buyer dominance (>). This means that CX Cargo has only limited power to extract value from the air freight forwarder. If value improvement occurs (either in the form of lower air freight rates or better service quality for specific products) it is normally determined by CX in response to competitive pressures in the market (Cox and Chicksand 2005, p. 655). This is due to the following key factors: there are a relatively small number of alternative air freight forwarders handling the
high value rock lobster shipments for CX Cargo to source business from in the local Melbourne market; there are other alternative airlines for the air freight forwarder to select from when shipping rock lobster consignments to Hong Kong; the switching costs for both CX Cargo and the air freight forwarder are relatively low; Forwarder B account is extremely attractive to CX Cargo for revenue; CX Cargo’s service offerings are standard and commoditized; the air freight forwarders search costs are low; and information asymmetry favours the buyer (international air freight forwarder).

Notwithstanding, the power regime oscillates between buyer dominance for the air freight forwarder (when there are many sources of supply for air freight space from Melbourne to Hong Kong, with constant price wars occurring, such as in the quiet winter season for airlines or the product is a low value commodity, such as broccoli, where the air freight rate heavily influences the landed price in Hong Kong) or interdependence for CX Cargo, where CX Cargo is in a stronger bargaining position with the air freight forwarder, and is therefore able extract a higher share of commercial value from the exchange (and therefore higher returns) (Cox and Chicksand 2005, p. 656). Thus, the relative power of CX Cargo is dependent upon air freight space scarcity. When air freight space is in short supply, for a short period of time, then CX Cargo may be able earn higher than normal returns. This interdependence situation exists when there are no real alternative sources of air freight space for the air freight forwarder, such as the busy Christmas and Chinese New Year periods, with no price wars, and the product is a high value premium product, such as southern rock lobster. Overall, CX’s net profit margin averages around 7 per cent.

**Melbourne Airport-based CTO/Ramp handling agent and Cathay Pacific Cargo**

The next set of exchange relationships in this network are those involving the CTO and aircraft ramp handling agent at Melbourne Airport (E) and CX (F). As Figure 5.7 shows, the commercial exchange relationship between the two actors is characterized by buyer dominance (>). International airlines have buyer dominance when they source commoditized products or services, such as their air freight and ramp handling contracts, relative to a given standard. This is because they possess the following key power levers over potential suppliers: there are few buyers (international airlines serving Melbourne); Cathay Pacific’s account represents a high volume relative to the CTO and handling
agent’s business turnover; Cathay Pacific’s switching costs are relatively low; Cathay Pacific’s account is highly attractive to supplier’s for revenue; the handling agent service offerings are standard and commoditized; Cathay Pacific’s search costs are low; and information asymmetry favours Cathay Pacific. Net profit margins at this stage of the supply are around 5-7 per cent.

- **Hong Kong Airport-based Ramp handling agent and Cathay Pacific Cargo**

We turn next to the final three dyadic relationships in the network, the exchange relationships between the Hong Kong based actors. The power relationship between CX and the ramp handling agent (F 0 G) is characterized as *independence* (0). The reasons for this power position are that CX fully owns the ramp handling agent (which operates as a fully owned subsidiary of the Cathay Pacific Group). Their relationship is therefore very close and collaborative. In addition, the ramp handling agent has been able to secure additional commercial contracts at Hong Kong International Airport which has enabled it to build scale economies, particularly as CX operations underpin the company. Hence, this state of interdependence is recognized by both actors on a day-to-day basis. This is because the power attributes of the buyer and supplier can be summarized as follows: the market has many buyers (international airlines serving Hong Kong) and a few suppliers (aircraft ramp handling agents), the aircraft ramp handling agents service offering is a standardized commodity, the buyer’s (international airlines) search costs are relatively low, the buyer has some information asymmetry advantages over the supplier; and the equity investment by CX is a strategic move to leverage its aircraft handling business by underpinning the ramp handling agent operations and enabling it to capture additional revenue/value from its investment.

- **Ramp-handling agent and cargo terminal operator**

The next dyadic relationship in the chain is that between the ramp handling agent (G) and the CTO (H) at Hong Kong International Airport. As Figure 5.7 shows, this dyadic relationship is characterized by *independence* (0) or commoditized exchange. Both the CTO (H) and the ramp handling agent (G) are selling specialized services to a relatively concentrated and well-informed customer base. As with all commodity-based exchange relationships, the buyer’s (international airline customers) search and switching costs are
relatively minimal (Cox et al. 2002, p. 223). Accordingly, both the CTO (H) and the ramp handling (G) work closely to service CX’s cargo and ramp handling requirements at Hong Kong International Airport and their relationship can be described as close and collaborative.

Accordingly, the power attributes of the CTO and the ramp handling agent can be summarized as follows: the CTO has some dependence on the ramp handling agent for revenue; both the CTO and the ramp handling agents switching costs are low; the CTO and the ramp handling agent provide a standardized service offering, which taken together is considered attractive by CX, and through the joint offering both the CTO/ramp handling agent earn valuable revenue; the buyer’s (CX) search costs are low; and the CTO has very limited information asymmetry advantages of the ramp handling agent.

- **Hong Kong Airport-based CTO and Cathay Pacific Cargo**

The next dyadic relationship in the chain is that between the Hong Kong-based CTO (H) and CX (F). The power relationship between CX and their cargo terminal operator at Hong Kong International Airport is normally characterized as buyer dominance (>) as international airlines have buyer dominance when they source commoditized products or services, such as their air freight handling contracts, relative to a given standard. In this particular chain, CX possesses the following key power levers over potential suppliers: CX is the largest airline serving Hong Kong, therefore CX’s account represents a very large share of the CTO’s business turnover; CX’s switching costs are relatively low; CX’s account is extremely attractive to the supplier for revenue; both Hong Kong Airport based CTO’s service offerings are standard and commoditized; CX’s search costs are low; and information asymmetry favours CX.

- **Cargo terminal operator and the importer/trader**

The dyadic relationship between the CTO (H) and the importer/trader (I) at Hong Kong International Airport is characterized by independence (0) or commoditized exchange. The CTO (H) is selling a specialized service to a relatively concentrated and well-informed customer base. As with all commodity-based exchange relationships, the buyer’s search and switching costs are relatively minimal, the supplier must pass value to the customer by
pricing in line with its costs of providing services (Cox et al. 2002, p. 223). However, due to the large volume of business handled, the CTO is able to earn a net margin of around 10 per cent. Notwithstanding, the CTO has high fixed costs, and therefore needs to maintain strong relationships with its customer base to ensure consistent and strong revenue generation.

Thus, the power attributes of the buyer and supplier are as follows: the buyer (I) has a relatively low share of the CTO (H) total revenue; both the supplier (CTO) and the buyer (importer/trader) switching costs are low; the CTO’s service offering is a standardized commodity; the buyer’s (importer/trader) search costs are low; and the CTO has very limited information asymmetry advantages of the buyer (importer/trader).

- **Cathay Pacific Cargo and the importer/trader**

The final dyadic relationship in the chain is that between the CX Cargo (F) and the importer/trader (I). As Figure 5.7 shows, this dyadic relationship is characterized by structural independence (=) or commoditized exchange. Under the arrangements between CX and its contracted CTO in Hong Kong, the importer/trader is required to obtain all inbound southern rock lobster shipment airway bills and the shipment delivery receipt from CX Cargo, in order to complete the Hong Kong customs clearance formalities and take delivery of the consignment. Indeed, southern rock lobster shipments provide air freight yields for CX Cargo, thus they aim to work cooperatively with the various Hong Kong-based importer/traders to ensure that the level of customer service is high. Accordingly, the power attributes of the buyer and supplier are as follows: there are many rock lobster importers/traders and many suppliers (airlines that serve the Melbourne to Hong Kong market); both the supplier and the buyer switching costs are low; CX Cargo’s service offering is a standardized commodity; the buyer’s (importer/trader) search costs are low; and CX has very limited information asymmetry advantages of the buyer (importer/trader).
5.4. Airline Strategy in the Melbourne to Hong Kong Rock Lobster Air Freight Market: Cathay Pacific Cargo

From its home base in Hong Kong CX serves 117 destinations around the world (either through its own services or via code-sharing services with partner airlines) with a modern fleet of both passenger and dedicated freighter aircraft. Historically, Cathay Pacific has always been ranked in the top air freight carrying airlines in the world. It has a record of providing excellent customer service levels and technical quality. The company has always been at the forefront of those airlines, which are keen to enhance the service levels provided to customers (Lobo and Zairi 1999, pp. 174-175).

The strategic focus of Cathay Pacific Cargo is primarily on the airport-to-airport transportation of air freight shipments. However, the airline also supplements its traditional airport-to-airport services with an extensive range of value-added air freight services, for example, its ‘Fresh Lift’ has been designed to provide effective cold-chain management so as to ensure all perishable type consignments arrive at their destination in a premium condition.

In recent years Cathay Pacific Cargo has significantly focused on product innovation and e-business systems. The use of advanced e-business systems and the provision of specialized aircraft containers designed for the carriage of perishable air freight shipments were highly regarded by both the exporter/processor and the international freight forwarder and therefore assists Cathay Pacific Cargo’s ability to earn a reasonable margin from its air freight transportation of southern rock lobsters from Melbourne to Hong Kong.

Whilst providing highly efficient services is regarded positively by Cathay Pacific Cargo’s customers in both Melbourne and Hong Kong, the level of value that it captures from its participation in air freight chains is influenced by its strategy of essentially limiting services to airport-to-airport transportation.
5.5 Cathay Pacific Cargo Value Appropriation Outcomes in Buyer and Supplier Exchange

CX, when acting as a buyer of its services in Melbourne and Hong Kong, enjoys buyer dominant collaborative relationships. This is because when purchasing contracted air freight and aircraft handling services, CX is in a buyer dominant position, and is therefore able to set price and quality standards now, and the ‘stretch’ targets for the future. Importantly, CX recognizes that the innovation in functionality and the costs of ownership required from suppliers is only possible when they have guaranteed commitment to a relationship and volumes of work (in this case, as CX is one of the largest airlines operating to Australia and Hong Kong, the airline provides air freight and aircraft ground handling agents with substantial cargo volumes to be handled and scheduled aircraft turnaround), with guaranteed margins. By providing these certainties CX is providing their suppliers with the confidence that they should make long-term dedicated investments in the relationship in order that innovation in handling services and cost reduction can take place over time. In this power scenario, therefore, CX dominates and pursues an adversarial commercial strategy with collaboration operationally. CX’s suppliers, on the other hand, have to accept a non-adversarial commercial strategy, but must accept collaboration operationally at the direction of CX, thereby accepting the volume of CX’s business rather than high margins/profitability from the relationship (Cox et al. 2004, pp. 100-101).

Importantly, in Hong Kong, CX fully owns it ground handling agent, which is operated as a 100 per cent owned subsidiary of the company. Consequently, the relationship between the two actors is extremely close and is based on a non-adversarial commercial and collaboration operationally basis.

Conversely, when acting as the supplier of freight capacity and services from Melbourne to Hong Kong, CX has a buyer-dominant collaborative relationship or a supplier-dominant collaborative relationship with the air freight forwarder. During the peak southern rock lobster season when air freight capacity from Melbourne to Hong Kong is in strong demand, then CX can employ a supplier-dominant collaborative relationship style. Conversely, the air freight forwarder can leverage their power position during non-peak or less busy times to extract more value from CX through lower air freight rates.
When a *buyer-dominant collaborative relationship* exists, Freight Forwarder B is in a strong position to set the price now, and the ‘stretch’ targets of the future. Importantly, this type of relationship is based on a long-term and collaborative basis. CX is a non-adversarial supplicant commercially, and accepts the business rather than high profit margins. Forwarder B adversarially appropriates most of the value in this type of relationship by utilizing their power leverage to extract lower rates from CX.

When acting in a *supplier-dominant collaborative relationship*, CX, by occupying a *supplier dominant* position, *adversarially* captures most of the commercial value created and has the ability to set prices. In addition, both CX and Forwarder B, have a long-term operational relationship and work closely together operationally to service Forwarder B’s rock lobster exporter/processors air freight transportation requirements to Hong Kong. Under these power circumstances, Forwarder B is a *non-adversarial* supplicant commercially, but *operationally collaboratively*, who is required to pay CX’s prices from Melbourne to Hong Kong. In this power scenario, therefore, Forwarder B dominates and pursues an *adversarial commercial* strategy with *collaboration operationally*. CX, on the other hand, has to accept a *non-adversarial commercial* strategy, but must accept *collaboration operationally* at the direction of Forwarder B, thereby accepting the volume of Forwarder B’s business rather than high margins/profitability from the relationship (Cox et al. 2004, pp. 100-101).

### 5.6 The Alignment of Cathay Pacific Cargo Buyer and Supplier Relationships in the Chain

CX when operating as a buyer of air freight and aircraft handling services enjoys an *aligned* relationship outcome. When buying services from its respective air freight and aircraft ground agents, the parties fully appreciate the power circumstances they are in presently, and what it is likely to be in the future. The parties accept that this is the best can be achieved and agree to work operationally in an appropriate fashion given the circumstances. The commercial benefits that both parties (buyer/seller) achieve are also accepted to be a direct result of the relative balance of power of CX, primarily due to its scale of operations, and the significant revenues that this contract brings to the appointed
suppliers. Moreover, both parties are satisfied in both Melbourne and Hong Kong that this is presently the best commercial and operational agreement that they can consummate. CX Cargo’s relationship outcome when acting as a supplier of air freight capacity can also be categorized as aligned. The parties in Melbourne (CX Cargo and International Air Freight Forwarder) fully understand the current power circumstances that presently exist, and what is likely to be achieved in the future. Both actors recognize that this is the best outcome that can be achieved and agree to work operationally in the appropriate manner given these circumstances. Indeed,

“While there are many airlines operating to Hong Kong, Cathay Pacific is our airline of choice due to their frequent services, favourable departure times and high standards of service …” (Forwarder B Informant).

The commercial benefits that each side achieves are also accepted by both actors to be a direct result of their power positions, and both parties are satisfied that this is currently the best commercial and operational agreement that they can enter into. Notwithstanding, as Cox notes, the major opportunities and risks in these circumstances are that there may be changes that enable one party to be opportunistic against the other – for example, a new airline service arriving in Hong Kong in the afternoon may be selected by the freight forwarder if the freight costs are lower, or that one or both of the parties become complacent and inertia enters the relationship, such that better value for money deals are overlooked by one or both parties (adapted from Cox et al. 2004, pp. 129-130).

5.7 Case Summary

We can draw several conclusions from this case. This thesis has argued while power plays a significant role in the commercial relationship exchange process, its influence is not universal. For instance, in the relationship between CX and the ramp handling agent in Hong Kong, power is absent. Furthermore, it is essentially absent in the relationship between the Hong Kong-based CTO and the importer.

Power plays a significant part, however, in the other commercial exchange relationships examined in this case. In terms of supplier power, the southern rock lobster
exporter/processor enjoys a privileged position. The regulatory protection that the company receives gives them what we have called a critical asset. Similarly, the relationship that exists between CX and its cargo and ramp handling agent in Australia and its contracted CTO in Hong Kong clearly favours CX. The power imbalance is predicated on the fact that aircraft ground handling agents and CTO’s are totally reliant on international airlines handling contracts for their business. Importantly, providing services for a greater number of airlines at the same airport allows for better productivity and economy of scale for handling firms; downtime is minimized between aircraft turnaround times and branding can be maintained by wearing an airlines uniform and accessorizing for whichever uniform they are working at the time (Croft 2003, p. 6). Cargo and ground handling organizations recognize that margins (and profits) decline significantly in competitive market scenarios (Ryan 2008, p. 133), such as the Melbourne Airport airfreight and aircraft ground handling market. Hence, it is extremely important for CTO and aircraft ground handling agents to ‘customize’ their service offering so as to sustain their relationship with their contracted airlines.

In the case of the relationship between the exporter/processor and the southern rock lobster fishers’ and the fisherman’s cooperative, however, a different structure of power is evident. Here, the critical asset is based on scale and runs to the exporter/processor. In recent years, the exporter/processor has grown their business strongly through innovation and a commitment to product quality, which has successfully enabled them to become one of Victoria’s top two southern rock lobster and fish exporters. The exporter/processor has developed strong brand awareness in Hong Kong and a reputation for high quality. The margins made by the southern rock lobster fishers’ and the fisherman’s cooperative would tend to suggest that these relationships with the exporter/processor are characterized by buyer power. However, the system of regulations that governs the commercial exchange relationships in this supply chain shows us that the rock lobster fisher’s, the fisherman’s cooperative and the exporter/processor are inextricably mixed. Indeed, as we have noted, the margins earned by the exporter/processor are shared with the rock lobster fishers’ and the fisherman’s cooperative. The exchange relationship that exists between these supply chain actors could, therefore, most accurately be characterized as one of interdependence (Cox et al. 2002, p. 123).
A similar interdependence relationship exists between the exporter/processor and the air freight forwarder. Both actors work together on a collaborative and cooperative basis to ensure that the exporter/processor’s southern rock lobster consignments are handled in a highly professional manner and are uplifted to Hong Kong as expeditiously as possible. The relationship is also underpinned by the e-business computer application developed by Forwarder B and have enabled the forwarder to earn a net margin of around 7 per cent.

Finally, we must consider the commercial exchange relationship that exists between the air freight forwarder and CX Cargo. Here, the critical asset is also based on scale and normally runs to the advantage of the international air freight forwarder. However, as we have noted, the power circumstances in this relationship vary between structural interdependence and supplier dominance. The relationship oscillates between these two power circumstances during times of peak demand when air freight space to Hong Kong is in high demand and during quieter periods when the volume of cargo space exceeds available demand. In addition, the international freight forwarder enjoys a critical asset from the system of regulation that governs exchange in the industry air freight in Australia. Notwithstanding, the air freight forwarders relationship with the exporter processor is on a transactional basis only. Hence, Forwarder B is quite vulnerable in that the exporter/processor could easily move their business to another air freight forwarder given the low switching and search costs in their relationship. In this event, the freight forwarders relationship vis-à-vis CX Cargo could change significantly as their purchasing power would be diminished. In addition, the use of advanced e-business systems and the provision of specialized aircraft containers designed for the carriage of perishable cargoes are highly regarded by both the exporter/processor and the air freight forwarder and therefore assists CX Cargo to earn a reasonable margin from its air freight transportation from Melbourne to Hong Kong.

The two case studies conducted in this study have examined in detail how value is captured by the respective chain actors participating in both the western and southern rock lobster air freight markets from Western Australia and Victoria to Hong Kong. The two cases have also examined and discussed the power regimes present between the chain actors in both the Western Australia and Victoria to Hong Kong live lobster chains. The following chapter summarizes the empirical findings of the two in-depth case studies. Importantly, the chapter identifies Cathay Pacific and Singapore Airlines Cargo present air freight strategies, their leverage positions and relationship alignment as buyers and
suppliers in chains. The subsequent chapter (Chapter 7) takes these insights as input and identifies the strategic options available to airlines to enhance their value capture and competitive advantage from the provision of air freight services.
CHAPTER 6: CAPTURING VALUE AND COMPETITIVE ADVANTAGE IN ROCK LOBSTER AIR FREIGHT CHAINS: THE EMPIRICAL FINDINGS.

6.1 Introduction

This thesis has been concerned with understanding what strategic options are available to international airlines to enhance the delivery and value capture in air freight markets and in the respective air freight supply chains in which they participate. The two previous chapters have presented the in-depth case studies and this chapter summarizes the empirical findings of the studies. Importantly, the chapter identifies Cathay Pacific Cargo and Singapore Airlines Cargo present air freight strategies, their leverage positions and relationship alignment as buyers and suppliers in chains. The following chapter takes these insights as input and identifies the strategic options available to airlines to enhance their value capture and competitive advantage from the provision of air freight services.

6.2 A Framework for the Empirical Research: The Fundamental Underpinnings

The research has been carried out within a well defined conceptual framework and it is useful to recall its key elements.

6.2.1 A supply chain / value chain perspective

The Cox emphasis on linking the notion of supply chain and value chain together within an exchange relationship is an insightful one. Robinson’s particularization of this relationship within the context of moving freight from seller to buyer provides further insights which fit well within the context of air freight chains and structures. Supply alternatives come at a cost; and they come also with a particular and unique ability to deliver value to the customer and to the chain actors and a particular and unique ability to capture value. A chain perspective ensures the importance of understanding these relationships (Robinson 2009).
6.2.2 Power and strategy: from positions of weakness to positions of strength

As noted in Chapter 2, Cox argues that the strategy “of a firm should focus on the acquisition and exploitation of supply chain and market power, and the pursuit of rents – earnings in excess of the firm’s costs of production that are not eroded in the long run by new market entrants” (p.6); and more recently he has suggested that firms in chains will be continually exploring ways not only of managing the power relationships in which they find themselves but also in finding ways and means of establishing more ‘congenial’ power positions (Cox et al. 2004, p. 45). To this end he has conceptualized, usefully and simply and based on his power matrix, a set of strategic options from which firms as buyers or sellers might, ideally, choose appropriate pathways or ‘routes’ to more favourable power relationships (Figures 2.5 and 2.6). Cox’s simple ‘power matrix’ (Figure 2.2) suggests that the relative utility and the relative scarcity of particular resources will underlie relationships, and power relationships, between buyers and suppliers. Critical assets, as key supply chain resources, may be held by buyers or by suppliers – in either a buyer dominant or a supplier dominant relationship. Where neither buyer nor seller holds resources of interest to the other a condition of independence is said to exist. With an interdependent relationship, both the buyer and seller possess resources that require the two parties to the commercial exchange to work closely together.

Cox has argued, and demonstrated, that value rarely flows in an uninterrupted manner from one end of a supply chain to the other. Evidence suggests that value is trapped in dyadic or extended dyadic relationships (sub-regimes) within a chain.

This research has also demonstrated the notion of single, double and more complex dyadic relationships and the existence of power sub-regimes in the chains. Figure 6.1 illustrates these relationships in the context of the case studies. Figure 6.1A shows a single dyadic relationship – in this instance suggesting that an importer/trader based in Hong Kong is able to extract value (high levels of profit) from the rock lobster exporter/processor. The double dyadic relationship in Figure 6.1B indicates that Singapore Airlines Cargo is able to extract value from this portion of the chain. The figure also shows that G and H conduct business under conditions of interdependence (=) or commoditized
Chapter 6
The Empirical Findings

exchange (Cox et al. 2002, p. 226). G is interdependent (=) upon H who in turn is dependent upon ‘G’. Figure 6.1C shows a more complex dyadic pattern in which the respective actors conduct business under conditions of structural interdependence (=). Under such circumstances, the actors have limited ability to extract value from their participation in the chain. (Note that Figure 2.2 in Chapter 2 details the key characteristics of Cox’s four basic elements of power in his ‘power matrix’).

![Diagram of power relationships]

**Figure 6.1.** Dyadic power relationships present in rock lobster air freight chains.

### 6.3 An Overview of the Case Study Evidence

Detailed case study analysis has provided insights into the dynamics and structure of the two supply chains examined in the study. The analysis has also identified the value appropriation outcomes of Cathay Pacific Cargo and Singapore Airlines Cargo in buyer and supplier exchange and has also identified their alignment in buyer and supplier relationships in the chains. Figure 6.2 provides a basis for identifying the fundamental similarities and differences present in the supply chain structures. Note that Figure 6.2, together with the other figures throughout this thesis detailing commercial exchange relationships, and chain structures, have been drawn to show the sequential functions of the chain as, A, B, C, D...and not the firm which carries out the function. Thus, A refers to the first function, B to the second and so forth. In supply chains 1 and 2 in Figure 6.2, for example, A refers in both chains to rock lobster fishers, but B, the second function, is provided by the exporter/processor in Chain 1 and the fisherman’s cooperative in Chain 2.
6.3.1 Supply chain similarities and differences

After analysing the functional, corporate and contractual relationship patterns present in the two supply chains it is evident that the supply chains are structured quite differently, especially in the pre-transport stage of the chains, and particularly in the rock lobster fishers and exporter relationships.

As we noted in both case studies, the Victorian and West Australian rock lobster fisheries are strictly controlled through governmental legislation. In both fisheries, the rock lobster fishers are required to sell their daily catches to licensed exporter/processors, or in the case of Victoria, the fishers can also sell their catches to a fisherman’s cooperative. The exporter/processors are licensed by the respective State governments to sell/market rock lobsters in both domestic and international markets. In Case Study 1, the exporter/processor sourced lobsters directly from the licensed rock lobster fishers. The
commercial exchange relationship between the two actors is one of interdependence (=).

In Case Study 2, the Victorian-based exporter/processor sources the rock lobsters from a fisherman’s’ cooperative (B=C), who in turns purchases the rock lobster fishers’ daily catches. The relationships between the rock lobster fishers and the fisherman’s cooperative and the exporter/processor is characterized as, being one of interdependence (=).

<table>
<thead>
<tr>
<th>Relationship between Exporter/Processor &amp; Rock Lobster Fisherman and Fisherman Cooperative.</th>
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<tbody>
<tr>
<td><strong>Case Study 1</strong></td>
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<tr>
<td><strong>Relationship between Lobster Fishers and Exporter/Processor</strong></td>
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<tr>
<td>RLF</td>
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<tr>
<td>Cooperative</td>
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<td>RLF</td>
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<tr>
<td>Cooperative</td>
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</tbody>
</table>

In both case studies the relationship between the exporter/processors and the Hong Kong-based importer traders is one of buyer dominance (>) (Table 6.2). In a commodity market, rival suppliers are typically differentiated based on the basis of price, and the buyer is able to switch suppliers with relative ease and at little or no cost should a more favourable deal emerge. Furthermore, the importer/traders search costs are quite low because rock lobster products are relatively homogenous. Together, these factors meant that in both case studies, the exporter/processor is forced to pass value to the importer/trader, in the form of price reductions, simply to retain his or her custom (Cox et al. 2002, pp. 93-94).

Consequently, the Hong Kong-based seafood importers/traders normally possess buyer dominance when they source commoditized products that are sold on a price basis relative to a given quality standard. This is because they have a number of key power levers over suppliers: there are few buyers (Hong Kong-based importer/traders) but many potential suppliers, not only located in Australia, but also in Vietnam, Mexico, South Africa and Cuba; the importer/trader’s business volumes are high relative to the supplier’s annual business turnover and the buyer’s account is very attractive to the supplier for revenue; the exporter/processor’s switching costs are high, those of the buyer are relatively low; the supplier (exporter/processor) offerings are standard and commoditised; the buyer (importer/trader) search costs are low; and information asymmetry favours the buyer (importer/trader).
The relationships between the air freight forwarders and the exporter/processor were identical with business conducted under conditions of structural *interdependence* (=) (Table 6.3). This relationship was evident in both case studies, as the air freight forwarders work closely with the exporter/traders to facilitate the expeditious and efficient transportation of the rock lobster consignments to Hong Kong.

The power attributes present reflect the following factors – there are few buyers (exporter/processor) with a relatively small number of air freight forwarders that have the facilities and expertise necessary to handle rock lobster consignments; buyers (exporter/processor) generally have a large, but not necessarily the total share of market sales for the supplier (air freight forwarder); the buyer and supplier switching costs are relatively high (in terms of perceived risks of finding either a new buyer and appropriate supplier); the supplier (air freight forwarder) finds the buyer’s account attractive; the buyer highly values the suppliers expertise, market knowledge and contacts; search and other related transaction costs to relocate their business with alternative freight forwarders are relatively low for the exporter/processor; services provided by the air freight forwarder are relatively standardized and information symmetry favours the supplier (air freight forwarder).

The commercial exchange relationships between the air freight forwarders and the airline (Table 6.4) was found in each case study to be *buyer dominant* (> in favour of the freight

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**Table 6.2. Relationship between Exporter/Processor and Importer/Trader.**

<table>
<thead>
<tr>
<th>Relationship between Exporter/Processor and Importer/Trader</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
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<tbody>
<tr>
<td>Buyer dominant (&gt; )</td>
<td>Buyer dominant (&gt; )</td>
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**Table 6.3. Relationship between Freight Forwarder and Exporter/Processor.**

<table>
<thead>
<tr>
<th>Relationship between Freight Forwarder &amp; Exporter/Processor</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
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<tbody>
<tr>
<td>Interdependent (=)</td>
<td>Interdependent (=)</td>
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</table>
forwarders during periods of surplus air freight capacity and *interdependence* (=) when air
freight capacity was scarce, such as during the peak air freight seasons (Chinese New
Year and Christmas).

### Table 6.4. Relationship between Freight Forwarder and Airline.

<table>
<thead>
<tr>
<th>Relationship between Freight Forwarder &amp; Airline</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
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<tr>
<td>Interdependent (=)</td>
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<td>Buyer dominant (&gt;)</td>
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In both case studies it was observed that there was an abundance of air freight capacity
available amongst the airlines. However, the importer/traders expressed a preference for
airline flights arriving in Hong Kong in the late afternoon or early evening. This was to
enable these firms to customs clear their rock lobster consignments and have them ready
for delivery to their clients either overnight or in the early morning. Interestingly, despite
both Cathay Pacific Cargo and Singapore Airlines Cargo having very favourable flight
arrival times into Hong Kong, their ability to capture value was quite limited due to the
competitive market dynamics. The yields of both airlines were influenced by the strong
power positions of the air freight forwarders. Other factors which also assist in defining this
relationship as essentially buyer dominant in favour of the air freight forwarder include the
fact that there are a relatively small number of air freight forwarders handling the higher
yielding lobster traffic for both Cathay Pacific Cargo and Singapore Airlines Cargo to
source business from in the local Melbourne and Perth air freight markets; the buyer's
switching costs are low; the air freight forwarders accounts are very attractive to both
airlines; both Cathay Pacific Cargo and Singapore Airlines Cargo service offerings, despite
being of a high quality and well recognized by their customers, are standardized and
commoditized; the air freight forwarders search costs are low; and information asymmetry
favours the buyer (freight forwarder).

In the commercial exchange relationships between the air freight forwarder and the cargo
terminal operator (CTO), the relationships in both studies were found to be identically
structured and could be described as being one of structural *interdependence (=)* (Table 6.5).

<table>
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<tr>
<th>Relationship between Freight Forwarder &amp; CTO</th>
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<tr>
<td>Case Study 1</td>
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<td>Case Study 2</td>
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The commercial exchange relationships between the air freight forwarder and the CTO in both case studies were based on a high level of supplier scarcity, a relatively high level of buyer scarcity and low search costs for the buyer (air freight forwarder). In addition, in both the Melbourne and Perth international air freight markets, the air freight forwarders are highly knowledgeable customers and possess a very good understanding of their business. Moreover, the CTO is selling a specialized but commoditised service, to a relatively concentrated and well-informed customer base. The following attributes are also present in this exchange relationship – air freight forwarders may have a large, but not total share of market revenue for the CTO; the CTO finds the air freight forwarder account attractive and the air freight forwarders value the expertise and knowledge of the CTO in handling air freight, and the CTO may have some moderate information asymmetry advantages over the air freight forwarder (Cox and Chicksand 2005, p. 656).

The relationship between the Perth-based aircraft ramp handling agent and CTO is characterized by structural *independence (0)* or commoditized exchange (Table 6.6). As noted previously, Cathay Pacific has awarded its aircraft ramp and cargo handling contract to a single service provider at Melbourne Airport.

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<thead>
<tr>
<th>Relationship between Australia-based Aircraft Ramp Handling Agents and CTOs</th>
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<tr>
<td>Case Study 1</td>
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<td>Case Study 2</td>
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</tbody>
</table>
The commercial exchange relationships between the airline and the cargo terminal operators in Australia were found to be one of buyer dominance (>)(Table 6.7) as international airlines have buyer dominance when they source commoditized products or services, such as their air freight handling contracts, relative to a given standard. In both case studies the airlines possessed the power advantages over potential suppliers – as two of the world’s largest air freight-carrying airlines their accounts represented a very large share of the CTO’s business turnover; the airlines switching costs are relatively low; the airline account is extremely attractive to the supplier for revenue; the CTO’s service offerings are standard and commoditized; the airline search costs are low; and information asymmetry favours the airline.

Table 6.7. Relationship between Airline and Australia-based CTOs.

<table>
<thead>
<tr>
<th>Relationship between Airline and CTO in Australia</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyer dominant (&gt;))</td>
<td>Buyer dominant (&gt;))</td>
<td></td>
</tr>
</tbody>
</table>

The same buyer dominant relationships applied between the airline and the Australia-based aircraft ramp handling agents (Table 6.8).

Table 6.8. Relationship between Airline and Australia-based Aircraft Ramp Handling Agents.

<table>
<thead>
<tr>
<th>Relationship between Airline and Australia based Ramp Handling Agents</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyer dominant (&gt;))</td>
<td>Buyer dominant (&gt;))</td>
<td></td>
</tr>
</tbody>
</table>

In the commercial exchange relationships between the airline and the Hong Kong-based aircraft ramp handling agents, the relationships were found to be buyer dominant (> for Singapore Airlines/SIA Cargo and independent for Cathay Pacific (0) (Table 6.9).
Singapore Airlines/SIA Cargo enjoys a buyer dominant position as it is one of the largest airlines serving Hong Kong and its contracts are highly regarded by suppliers as they represent a high volume of revenue relative to the suppliers business turnover; the airline switching and search cost are low; the suppliers provide a standardized and commoditized service, and information asymmetry favours the airline. Conversely, Cathay Pacific Airways fully owns the Hong Kong-based aircraft ramp handling agent and their relationship is very close and collaborative. The investment in the ramp handling function is a strategic move by Cathay Pacific Airways to leverage its handling requirements by underpinning the ramp handling agents operations and enabling it to capture additional revenue/value from its investment.

The commercial exchange relationships between the airline and the cargo terminal operators in Hong Kong were found to be identical and are characterized as buyer dominance (>) (Table 6.10).

The relationship between the Hong Kong-based aircraft ramp handling agent and CTO is characterized by structural independence (0) or commoditized exchange (Table 6.11).
This situation occurs because neither actor possesses power over the other as the decision to use their services is made by their customer airlines. The power attributes of the actors can be summarized as follows – the CTO has little dependence upon the aircraft ramp handling agent for revenue; both the CTO and the aircraft ramp handling agents switching costs are low; both actors are providing standardized and commoditized services, which taken together are considered attractive by airlines, and the CTO has very limited information asymmetry advantages over the aircraft ramp handling agent.

The commercial exchange relationships between the CTO and the Hong Kong-based importer/traders in both case studies were characterized by independence (0) (Table 6.12).

This situation arises when neither party has power over the other (Cox et al. 2002, p. 226). The CTO is selling a specialized service to a relatively concentrated and well-informed customer base. With commodity-based exchange relationships, the supplier is typically required to pass value to the customer by pricing in line with its costs of providing services (Cox et al. 2002, p. 223). However, and interestingly, in both case studies, due to the large volume of air freight traffic handled at Hong Kong Airport, the CTO is able to earn a net margin of around 10 per cent.
Table 6.13 shows that the commercial exchange relationship between the airline and the Hong Kong-based importer trader was characterized as structural independence (0) in both case studies. In both case studies, the two airlines required the importer/trader to obtain their rock lobster consignment airway bills and shipment delivery receipts from their cargo offices based in their appointed CTO cargo terminal.

<table>
<thead>
<tr>
<th>Relationship between Airline and Importer/Trader</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independence (0)</td>
<td>Independence (0)</td>
<td></td>
</tr>
</tbody>
</table>

Both Cathay Pacific Cargo and Singapore Airlines Cargo noted that rock lobster consignments from Melbourne and Perth, respectively, are a vital and high-yielding revenue source. Accordingly, both airlines endeavour to work collaboratively and closely with the Hong Kong-based importer/traders to ensure that a high level of customer service is delivered. The power attributes present in the relationship can be summarized as follows – there are a relatively large number of Hong Kong-based rock lobster importer/traders and many suppliers (airlines that serve the Melbourne and Perth to Hong Kong markets); both the supplier (airline) and the buyer (importer/trader) switching and search costs are low; the airline service offering is a standardized commodity; and the airline has very limited information asymmetry advantages over the buyer (importer/trader).

### 6.3.2 Levels of value captured by the actors in the supply chains

As previously noted, supply chains consist of a series of dyadic power relationships and it is the interrelationships between these dyads that determines the distribution of value between the actors participating in the chain (Cox et al. 2002, pp. 218-219).

Table 6.13 summarises the percentage of value captured by each of the actors in the supply chains examined in this study. As Table 6.14 shows, both Cathay Pacific Cargo and Singapore Airlines Cargo value capture is quite low at 4-5 and 5-7 per cent, respectively. In Case Study 1, the importer/trader in Hong Kong appropriates the highest
The percentage of value flowing across the chain (net present returns)

<table>
<thead>
<tr>
<th>Lobster Fishers</th>
<th>Fisherman's Cooperative</th>
<th>Exporter / Processor</th>
<th>Freight Forwarder</th>
<th>CTO</th>
<th>Ramp Handling Agent</th>
<th>Airline</th>
<th>Ramp Handling Agent</th>
<th>CTO</th>
<th>Importer / Trader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Study 1</td>
<td>5-6%</td>
<td>N/A</td>
<td>10%</td>
<td>10%</td>
<td>4-5%</td>
<td>5%</td>
<td>4-5%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Case Study 2</td>
<td>10%</td>
<td>7-8%</td>
<td>8%</td>
<td>8%</td>
<td>5-7%</td>
<td>N/A</td>
<td>5-7%</td>
<td>5%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Note:

1. Value is measured in terms of the net present returns to the chain actors.
2. Case study number 1, the rock lobsters are acquired directly from rock lobster fishers.
3. Case study number 2, Cathay Pacific’s aircraft and cargo handling are performed by a single service provider.

6.4 The Current Cathay Pacific Cargo and Singapore Airlines Cargo Air Freight Strategies

Cathay Pacific Cargo and Singapore Airlines Cargo current air freight strategies are summarized in Table 6.15. As we can see, both airlines focus primarily on providing high quality airport-to-airport air freight services, which are underpinned by the use of modern information technology (IT) systems and highly efficient air freight handling terminals (CTOs). Both airlines operate extensive dedicated freighter service networks. These services are in addition to the substantial lower deck belly-hold capacity provided on their scheduled passenger services operated to and from their home base hub airports. The air freight distribution system of both airlines in Australia is based on the use of accredited International Air Transport Association (IATA) air freight forwarders, who act as the intermediary between the two airlines and air freight shippers. In Australia, this strategy is principally due to the extremely stringent DOTAR’s Regulated Air Cargo Agent (RACA) regulations, which stipulate that only authorized RACA’s can accept and process air freight consignments. Given the small number of staff employed by both Cathay Pacific Cargo and Singapore Airlines Cargo in Australia, they do not have sufficient resources to deal directly with air freight shippers as authorized RACA’s.
A key strategy for both Cathay Pacific Cargo and Singapore Airlines Cargo is the use of block air freight space agreements under which dedicated freight space (by weight and volume) is allotted on specific flights for the rock lobster exporter/processors and air freight forwarders shipments of live rock lobsters from Melbourne and Perth to Hong Kong. Shippers and international air freight forwarders benefit from such an agreement because it secures access to air freight capacity if capacity is scarce and also locks in air freight prices. The incentive for both Cathay Pacific Cargo and Singapore Airlines Cargo in concluding blocked space air freight agreements is the reduction in capacity utilization risk since these agreements partially move the risk to the airlines partner (Hellermann 2006, p. 2). Such strategies were noted as highly important during the case study interviews with the rock lobster exporter/processors and the air freight forwarders both favourably noting these strategies of Cathay Pacific Cargo and Singapore Airlines Cargo –

‘….the guaranteed air freight space from Melbourne to Hong Kong from our blocked space agreement is vital in ensuring a consistent quality of services for our client’s rock lobster shipments to Hong Kong’ (Informant A, International Air Freight Forwarder).

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35 An air freight block space agreement is a contractual arrangement between an airlines and a third party, for example, an international air freight forwarder, whereby a specified amount of air freight space is allocated between two or more points on an airline’s route network for a given period of time (Lu 2003, p. 62).
Both airlines have also developed their own express air freight products to better compete with the integrators, though importantly these services are normally only offered on an airport-to-airport basis and require collaboration with an international air freight forwarder (Bowen and Leinbach 2003, p. 312).

Furthermore, there is increasing value being placed by shippers on information flows in supply chains. A single source of information for shippers or consignees for product flow information, such as consignment tracking, enables shippers or consignees to implement leading-edge delivery solutions (Hebert et al. 1998a, p. 116). In recognition of this important customer requirement, both Cathay Pacific Cargo and Singapore Airlines Cargo have made substantial investments in IT systems, in order to provide real-time information and e-business solutions for their customers.

Finally, and importantly, there is a distinction between the two airlines air freight business models. Cathay Pacific Cargo operates as the air freight division for Cathay Pacific Airways. In contrast, SIA Cargo operates as a self-sufficient entity within the Singapore Airlines Group (Ionides 2001, p. 8). SIA Cargo pays a fee for the use of the lower deck belly hold air freight space on its parent company, Singapore Airlines, passenger flights and also operates a fleet of 11 Boeing B747-400 freighter aircraft, using its own air operators certificate (AOC).

6.5 Cathay Pacific and Singapore Airlines Cargo Leverage Positions as Buyers and Suppliers

Buyer and supplier relationships can only exist if both parties obtain some gains from the trade that occurs between the supply of products/services and their exchange for money. This occurs because no firm would trade with another if both sides did not achieve something that they value from the relationship (Cox 2001b, p. 4). According to Cox and Chicksand (2007a, p. 6), the first step for business success for any firm is for it to understand its power position as a buyer and seller.

As we can observe from our case study analysis, both Cathay Pacific Cargo and Singapore Airlines Cargo when acting as buyers of air freight and ramp handling services
enjoy a position of *buyer dominance* (Figure 6.3). This is because their suppliers, air freight and aircraft ground handling agents, are normally highly dependent on international airlines for business and must supply services at a price that minimizes the returns to the airline’s suppliers. Notwithstanding, there is still considerable scope for the actors to undertake commercial collaboration. Singapore Airlines provides high volumes of business in both Perth and Hong Kong. Similarly, Cathay Pacific Airways is one of the world’s largest air freight-carrying airlines, operating a large fleet of wide-body passenger aircraft and dedicated freighter services around the world. Consequently, both Cathay Pacific Airways and Singapore Airlines Cargo aircraft and air freight handling contracts are highly sought after due to their large number of flight frequencies and air freight volumes. In such circumstances it is logical for preferred suppliers to align their operational processes and systems in such a way as to optimize service and quality delivery at the lowest transaction costs possible (Cox and Chicksand 2005, p. 656).

![Figure 6.3.](image)

*Cathay Pacific and Singapore Airlines Strategic Positions as Buyers*

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**Figure 6.3.** Cathay Pacific Cargo and Singapore Airlines Cargo leverage positions as buyers in the Cox power matrix. 
However, as Figure 6.4 indicates, in the two air freight chains supply chains examined in the study, both Cathay Pacific Cargo and Singapore Airlines Cargo, when acting as suppliers of air freight capacity, normally have relatively weak power positions, with only limited power levers over air freight forwarders and shippers.

![Diagram](image)

**Figure 6.4.** Cathay Pacific Cargo and Singapore Airlines Cargo leverage position as suppliers in the Cox power matrix.


In fact it is clear that any benefits arising from within the industry to reduce costs, with a strategy focused on lean cost leadership (Porter 1985, pp. 12-14), will be passed back to the powerful actors in the chain – the rock lobster exporter/processors, importer/traders – based in Hong Kong – and the air freight forwarders (Cox et al. 2007, p. 6).

However, as the two case studies revealed, both airlines’ power positions were considerably enhanced when there was a strong demand for air freight capacity, as in the case of Australia’s peak summer air freight season. During such times, both airlines enjoyed a position of supplier dominance as the air freight forwarders and rock lobster shippers were highly dependent on the two airlines for air freight capacity to transport their rock lobster consignments to Hong Kong. During such periods, the air freight forwarder/shippers accounts were considered very attractive by both airlines due to the
high yields that they earned from the transportation of the rock lobster air freight consignments from Melbourne and Perth to Hong Kong. Furthermore, during periods of high demand for air freight space, both Cathay Pacific and Singapore Airlines Cargo enjoy substantial information asymmetry advantages over their customers.

6.6 The Alignment of Cathay Pacific Cargo and Singapore Airlines Cargo Buyer and Supplier Relationship Outcomes in Chains

The final part of our case study involves the determination of the relationship outcomes for Cathay Pacific Cargo and Singapore Airline Cargo when acting as buyers and suppliers. Recall that Cox et al. (2004, pp. 129-130) have argued that there are three possible relationship outcomes – aligned, misaligned and sub-optimal and dysfunctional conflict.

Table 6.16 notes that both Cathay Pacific and Singapore Airlines Cargo, when acting as buyers, enjoy *aligned* relationships. When buying services from their respective air freight and aircraft ground handling agents, the parties fully appreciate the power circumstances they are in presently, and what it is likely to be in the future. The parties accept that this is the best that can be achieved and agree to work operationally in an appropriate fashion given the circumstances. The commercial benefits that both parties (buyer/seller) achieve are also accepted to be a direct result of the relative balance of power of Cathay Pacific and Singapore Airlines Cargo, primarily due to their scale of operations, and the significant revenues that their handling contracts brings to their appointed suppliers. Hence, the two airlines’ Melbourne, Perth and Hong Kong-based contracted aircraft ramp handling agents and cargo terminal operators are satisfied that this is presently the best commercial and operational agreements that they can achieve.

<table>
<thead>
<tr>
<th>Alignment of Airline as a Buyer in the Chain</th>
<th>Case Study 1</th>
<th>Case Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligned</td>
<td>Aligned</td>
<td>Aligned</td>
</tr>
</tbody>
</table>

Both Cathay Pacific Cargo and Singapore Airlines Cargo relationship outcomes when acting as a supplier of air freight capacity were also categorized as *aligned* (Table 6.17).
The air freight forwarders and Cathay Pacific Cargo and Singapore Airlines Cargo in Melbourne and Perth fully understand the current power circumstances that presently exist in their commercial exchange relationships, and what is likely to be achieved in the future. The actors recognize that this is the best outcome that can be achieved and agree to work operationally in the appropriate manner given these circumstances. The commercial benefits that each side achieves are also accepted by the actors to be a direct result of their power positions, and the various parties are satisfied that this is currently the best commercial and operational agreement that they can enter into.

<table>
<thead>
<tr>
<th>Table 6.17. Relationship alignment of airline as a supplier in the chain.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alignment of Airline as a Supplier in the Chain</strong></td>
</tr>
<tr>
<td>Case Study 1</td>
</tr>
<tr>
<td>Case Study 2</td>
</tr>
</tbody>
</table>

Notwithstanding, as Cox notes, the major opportunities and risks in these circumstances are that there may be changes that enable one party to be opportunistic against the other – for example, a new airline service arriving in Hong Kong in the afternoon may be selected by the air freight forwarder if the freight costs are lower, or that one or both of the parties become complacent and inertia enters the relationship, such that better value for money deals are overlooked by one or both parties (adapted from Cox et al. 2004, pp. 129-130).

6.7 The Rock Lobster Traffic Flow Patterns

Time is a critical factor in the value definition of food products. Perishability in the rock lobster product group is a predominant driver of a product's lifetime value. When the consume-by date has elapsed, the product loses a significant part of its value, or, at worst, regulatory authorities forbid it for sale (Koch and Kraus 2007, p. 381).

The choice of flight from Perth to Hong Kong for the western rock lobster air freight consignments is principally determined by the Hong Kong-based importer/traders who typically prefer flights arriving in Hong Kong late in the afternoon. The late afternoon arrival
time enables the importer/traders to complete their rock lobster air freight consignments customs clearance formalities and then subsequently arrange their distribution to customers in the early evening/morning. A further factor considered in the choice of flight by the shipper and consignees is whether the flights transfer via a hub airport or operates directly from Perth to Hong Kong. At the time of the study, both Cathay Pacific Airways and Qantas Airways operated direct flights from Perth to Hong Kong. Despite the direct services, the flight times were considered not suitable for the Hong Kong-based importer/traders due to their early morning arrival times in Hong Kong. Hence, the exporter/processor in conjunction with the air freight forwarder and the Hong Kong-based importer/trader selected Singapore Airlines for the carriage of their rock lobster air freight consignments. Singapore Airlines Flight 224 departs Perth at 0735hrs arriving in Singapore at 12.55hrs. The Hong Kong destined rock lobster consignments are directly transferred from SQ224 to SQ366 departing Singapore at 13.30hrs and arriving in Hong Kong at 17.15hrs local time. The average elapsed time for the two flights, including the transit time at Singapore Changi Airport, is 8.35 hours (Figure 6.5). The overall transportation time from the exporter’s premises to the importer/trader’s premises in Hong Kong is approximately 15 hours.

Figure 6.5. Singapore Airlines flight routings from Perth to Hong Kong.
In the Melbourne to Hong Kong rock lobster air freight supply chain the lobster air freight consignments are in Cathay Pacific Cargo’s control for around 13 hours. About 25 per cent of this time consists of the time taken for processing by the CTO at Melbourne (2.0 hours) and Hong Kong (1.30 hours). In order to ensure that the rock lobsters arrive in Hong Kong in premium condition and in accordance with the importers preferred arrival time requirements, the Melbourne-based exporter/processor utilizes the daily CX134 direct Melbourne to Hong Kong service. The average elapsed time for the flight is 9.35 hours (Figure 6.6). The overall transportation time from the exporter’s premises to the importer/trader’s premises in Hong Kong is approximately 17 hours.

Figure 6.6. Cathay Pacific Airways flight routing from Melbourne to Hong Kong.

6.8 Summary

This chapter has presented, in some detail, the empirical findings from the two case studies. It has summarized the supply chain similarities and differences, the level of value
captured by the respective chain actors participating in the supply chains and presented Cathay Pacific Airways and Singapore Airlines present air freight strategies. Importantly, both Cathay Pacific Cargo and Singapore Airlines Cargo leverage positions as buyers and suppliers and the alignment of their respective leverage buyer and supplier relationship outcomes were identified and discussed. The chapter concluded with an analysis of the perishable air freight flow patterns. The following chapter takes these insights as input and identifies the strategic options available to airlines to enhance their value capture and competitive advantage from their participation in air freight chains and addresses the hypotheses formulated to undertake the study’s empirical research.
CHAPTER 7: CAPTURING AND DELIVERING VALUE: STRATEGIC OPTIONS FOR AIR FREIGHT CARRIERS.

7.1 Introduction

Most airlines continue to regard air freight as an economy of scope by-product of their passenger operations and have until now limited their services to an airport-to-airport product, primarily marketed by the air freight forwarding industry and often priced on a marginal or incremental basis. This has resulted in a significant erosion of airline yields and margins and has placed airlines in a weak power position in international air freight chains, exposing them to the innovative logistics solutions developed by the integrators. Failure to implement ‘end-to-end logistics solutions’ for shippers has enabled their integrator rivals – DHL, FedEx, and United Parcel Service (UPS) – to capture significant market share by operating door-to-door freight networks, particularly for high yielding time-critical products.

What strategic options are, in fact, available to air freight carriers to create and sustain competitive advantage and in effect, to enhance both the value the airline may deliver and the value that it may capture?

This thesis has been designed around these two issues; it has focused on the notion of value delivery and value capture in air freight chains and on the issues associated with the ways in which carriers may move from a position of relative weakness in the market to a position of strength. It has been guided by the work of Andrew Cox; and in-depth case studies have demonstrated, among other things, the complexities of power relationships in chain structures and the nature and extent of value appropriation.

This chapter builds on the empirical findings of the research, reported in Chapter 6, and focuses attention on the strategic options that may offer carriers opportunities for better value outcomes. It takes the view that ‘conventional wisdom’ has focused on the firm as an entity competing in the marketplace and on strategies for creating and sustaining competitive advantage. The perspective offers insights into strategy formulation for any firm – including air freight carrier firms.
But it suggests also, on the basis of the research presented in this thesis, that air freight carriers operate essentially as firms in chain structures; and that meaningful strategies must be defined on the basis of understanding of the dynamics of the chain and, particularly, of the power relationships which impact value delivery and appropriation.

This chapter falls into two parts reflecting these two perspectives.

**PART A: STRATEGIC OPTIONS: THE CONVENTIONAL WISDOM**

### 7.2 Strategy: The Broader Picture

Certainly the work of Michael Porter has laid the foundation for much of the thinking on strategy from the 1980s through to some clarification in emphasis in 1996 (Porter 1996). The notion of generic strategies – cost leadership, differentiation and niche or strategies of scope – remain pertinent; and his 1996 emphasis on the precise selection of activities on the basis of contribution of value provides better insights into how firms create and sustain value. However researchers – Hamel and Prahalad (1994), Kaplan and Norton (1996, 2001), Greenwald and Kahn (2005) and many others – have added emphasis in one way or another without diminishing the essentials of the Porter perspective. Recently, and most usefully, Kim and Mauborgne (2005) have built to significant effect on these essentials in their book *Blue Ocean Strategy*.

For Porter, competitive advantage grows out of the way a firm organises and performs a set of interlinked and self-reinforcing activities to deliver value to customers. An airline can achieve greater financial performance by performing activities that are distinct from its competitors or it can perform the same activities as rivals but in a different, innovative and more effective way. For international airlines participating in air freight chains, the provision of services will not automatically generate additional air freight traffic nor will the adoption of industry best practices or cost reduction or improvements in internal business processes. This is because operational effectiveness, though important to the firm’s overall performance, only indicates how effectively an airline produces services but not which service it should provide or whether the service it produces is the one that shippers require. Thus, it is the international airlines ability to offer a competitive air freight service offering that is valued by the shippers which counts. Within this
perspective, the value which shippers seek becomes the guiding element in determining what to offer or to improve in order to attain both competitive advantage and growth within a framework based on both operational effectiveness and strategic positioning (Porter 1996).

In this context, we will note, briefly, how some of the strategic options which are discussed by Porter and others may, or may not, have some interest to air freight carriers – and to Cathay Pacific Cargo and Singapore Airlines Cargo, as the two carriers involved in the case studies.

### 7.2.1 Cost leadership as a strategic option?

In implementing a marketing and sales strategy based on cost leadership a firm seeks to sustain reduced prices over its competitors on the basis of having the lowest cost base in such a way that it cannot be imitated by rivals. If cost leadership can be realized a substantial market share advantage can be created through economies of scale, market power (buyer and selling power), and experience curve effects (Cox et al. 2007, p. 8). A cost advantage may also be attained from knowing how a product can be produced using low-cost production systems, how to produce more efficiently; and how to achieve locational cost advantages (lower labour and distribution costs) (Johnson and Scholes 1999, pp. 275-276).

Achieving a low-cost position often requires a high market share so that economies of scale can be realized. Thus, firms adopting a low cost strategy place a high emphasis on cost minimization at every possible point. Therefore, it may be required to design products or services for ease of manufacture or delivery. Once a low-cost position is achieved, profits need to be reinvested in improved processes and technologies that enable the firm to further reduce costs so that its cost leadership position can be sustained (Kling and Smith 1995, p. 27).

Both Cathay Pacific Cargo and Singapore Airlines Cargo current air freight strategies focus on their advantages of scale, which includes knowledge advantages (experience effects). For example, Singapore Airlines Cargo staff training and expertise extends to understanding the requirement for rock lobsters to be transported in a semi-comatose state to preserve their freshness, desirability and market price. Clearly, a low cost strategy typically works best when low price is important to the customer relative to a given quality standard, as is the case in the two supply chains examined in this study.
Notwithstanding, such a strategy would be problematic for Singapore Airlines Cargo, as the size of the Perth air freight market is very small in terms of the volumes of air freight and the number and types of commodities exported by air, with available airline freight capacity vastly exceeding market demand. Due to these conditions, air freight prices have consistently declined over recent years as airlines have fought to capture and retain market share. The market is also extensively served by Australia’s national airline, Qantas, which enjoys scale advantages. Therefore, competing on price against rivals with scale advantages (such as, Qantas) is not an ideal strategy for long-term success or high returns. This is why differentiation strategies to attain higher returns may be more suitable to Singapore Airlines Cargo when scale economies are not always feasible.

Furthermore, Cox et al. (2003, p. 69) argues that it is possible that ‘a firm may recognize that it can only achieve cost leadership if it focuses not only on its own internal process improvements but also those available to it by working closely with its immediate suppliers and their supply chain in the total supply chain’. In this way, the focal firm may decide to compete on cost leadership by developing and implementing much more efficient SCM processes than its competitors are able to achieve. One method of achieving this objective is by outsourcing all non-core activities to lower cost suppliers and managing their own and their supplier’s activities proactively. In fact, Singapore Airlines Cargo has adopted such a strategy and outsources wherever it can to control costs, including contracting ground handling services of SIA Cargo to SATS Airport Services at Singapore Airlines Changi Airport hub (Hill 2004, p. 52).

The major difficulty with this approach is that even when successful it typically does not generate above normal returns. This occurs because the cost savings achieved from both internal and external process improvements are normally passed on to the customer in the form of lower prices, rather than retained as higher levels of firm profitability. The major benefit for the successful company, however, is that they attain a greater market share, until others catch up by imitating the same internal and external supply chain process efficiencies (Cox et al. 2003, p. 69).
7.2.2 Differentiation as a strategic option

Given the problems associated with Cathay Pacific Cargo and Singapore Airlines Cargo in pursuing cost leadership strategies in the Melbourne and Perth to Hong Kong rock lobster air freight markets, it is essential for both airlines to consider the scope for differentiation in the rock lobster supply chains in which they participate. In a differentiation strategy, a firm seeks to be unique in its industry through the provision of a unique market offering that delivers superior value to its customers relative to its competitors. The firm is rewarded for its uniqueness with a premium price. Porter argued that, by creating customer loyalty and price inelasticity, this strategy erects barriers to competitors’ market entry, provides higher margins, and reduces the power of buyers who feel they lack acceptable substitute products (Miller 1988, p. 283; Porter 1985, p. 14).

The air freight value propositions of Cathay Pacific Cargo and Singapore Airlines Cargo will depend on the type of commodities being transported. It is, however, most probable that the pursuit of a differentiation strategy requires the development of: specialty products/services; quality, regional or global brands\(^{36}\); or unique services. In addition to the focus on the product/service, differentiation strategies also focus on service provision and how services are provided. This can include a variety of direct sales channels (for example, internet sales or direct customer sales).

Both Cathay Pacific Cargo and SIA Cargo might achieve a differentiation strategy through:

- Improvements in products and services - for example, by investment in research and development - as to how air freight products can be more efficiently transported, product design expertise or building on the innovatory capabilities of the organization (There is evidence that both Cathay Pacific and Singapore Airlines Cargo have pursued such a strategy by acquiring technologically advanced refrigerated airline containers, which the two airlines use for the carriage of perishable air freight consignments). Notwithstanding, it should be noted that such improvements are often not durable as rival firms are normally able to replicate the product or service;

\(^{36}\) Branding as a competitive strategy is examined in Section 7.2.6 below.
Chapter 7
Air Freight Strategic Options

- A competence-based strategic approach in which the airlines endeavour to build differentiation into their core competences. Competences that are unique to the firm often make it very difficult for competitors to imitate them; and
- Adopting a marketing-based approach – in effect, demonstrating better how its product or service satisfies customer requirements. In this instance, the strategy is likely to be built on the power of the brand or through powerful promotional schemes (Johnson and Scholes 1999, p. 276).

The real value of differentiated services is the premium prices that can usually be charged. The negative side is, however, the problem of volume and scale, and delivery costs, which create problems for profitability if the differentiated services do not generate a substantial profit despite the premium prices charged. Moreover, the size of the market for differentiated services may be much smaller than that for undifferentiated services/products (Cox et al. 2007, p. 8).

7.2.3 A hybrid strategy?

It is also possible for international airlines to simultaneously endeavor to provide added value in customer terms, while also seeking to price lower than competitors for similar air freight products and/or services. Making a success of such a strategy depends upon the ability of the international airline to understand and deliver enhanced value in terms of customer requirements, while also having the cost base that enables low prices and leads to sufficient margins that permit reinvestment to maintain and develop the basis for continued differentiation in the future. The problem with this approach is that it creates a treadmill to low returns due to the constant raising of customer expectations about quality improvements with lower costs (Cox et al. 2007, pp. 8-9). Notwithstanding, a hybrid strategy could be advantageous in the following situations:

- If there is a market segment with specific requirements which also facilitates a low-price approach;
- If much larger air freight volumes than the competition can be captured, and margins kept attractive because of a low cost base; and
- As an entry strategy in a market with established competitors. The objective is to secure
market share, divert the attention of the competitor, and establish a foothold from which they can move further. However, in pursuing such a strategy it is important to ensure that (a) the overall cost base is such that low margins can be sustained, and (b) a clear follow-through strategy has been considered for when market entry has been achieved (Johnson and Scholes 1999, pp. 281-282).

7.2.4 Diversification strategies?

Sometimes when international airlines are operating in highly competitive air freight markets diversification into more value adding products and/or services may provide an answer to low commercial returns. This can take the form of either related or unrelated diversification (Cox et al. 2007, p. 9).

Related diversification is the development of the firm beyond the present product or service market, but still within the broad confines of the ‘industry’, that is, value chain, in which the firm operates. This can be achieved through backward integration into activities which are concerned with inputs into the firm; forward integration into activities which are concerned with firms’ outputs; or horizontal integration through the development of activities which are competitive, or directly complementary, to current activities. Conversely, unrelated diversification relates to opportunities beyond the present product and marketing base of the company and outside the current industry in which it participates (Johnson and Scholes 1999, pp. 323-330).

International airlines can consider diversification as a key strategy in capturing additional business and competitive advantage in air freight transportation. Three broad reasons are apparent. First, diversification can be pursued as a response to specific air freight market requirements, in particular, the growing requirement by shippers for ‘one stop shop’ logistics solution providers (Murphy and Daley 1995, p. 23; Wagner and Frankel 1999, p. 77). The diversification into third party logistics and supply chain management related services has resulted from shippers’ requirements for cutting edge IT solutions; strategic partnerships within the supply chain, including tailored-logistics services; extended geographical coverage, service offerings and value-added services, and tougher competition due to more operators in the industry (Markides and Holweg 2006, p. 346; Semeijn and Vellenga 1995, pp. 27-28). Second,
diversification strategies can be adopted by international airlines as a solution to specific problems that have arisen from the change in demand conditions, for example, the decline in the volumes of Australian origin fresh fruit air freight shipments destined to Asia due to the increased use by exporters of ocean transport as a result of the faster sailings and improved refrigeration technologies. The third reason for employing a diversification strategy is the perception that diversification is an ideal strategy; the rationale being that it will protect the firm as a whole against foreseen and unforeseen changes in the demand for services which might adversely affect the levels of air freight business handled by international airlines.

The notion that diversification is the most effective ‘hedging’ mechanism against all kinds of adverse influences, and therefore the most appropriate strategy for offsetting the vulnerability of the organization to such changes, is widely accepted. However, firms need to be cognizant of the significant risks associated with a diversification strategy, for the fully diversified firm is almost as vulnerable as the completely specialised one in the face of intense competition, especially when the competition is associated with rapid innovation (Amit and Livnat 1988, p. 163; Lang and Stulz 1994, pp. 1278-1279).

The prospects of international airlines are not automatically enhanced by simply diversifying into new air freight markets. The real opportunities to secure competitive advantage through diversification exist only where the actor sees a number of possible uses of its unique resources and capabilities to earn a profit with due consideration of the ‘opportunity cost’ of its resources, that is, with reference to other available alternatives, for example, an international airline seeking to diversify into dedicated freighter operations through the acquisition of cargo-only aircraft may find that their resources can be more profitably utilized by expanding their passenger operations as the revenue potential from passenger services would be potentially greater from passenger operations.

Hence, when firms are considering the decision to diversify, managers are required to think not about what their firm does but rather what it does better than its competitors (Markides 1997, p. 94). Moreover, excelling in existing businesses does not always provide a guarantee of success in a new or related business. Dutton (1997, p. 57), in a study of diversification strategies for firms, found that the most consistently profitable firms are those that diversify around their core competencies. When firms possess no special advantages which will facilitate their entry into
new markets they must, like any new and not particularly well-endowed entrepreneur, seek opportunities where market entry is relatively easy and no special skills are required. In addition, when entering a new air freight market, international airlines must consider not only the rate of return it may expect from its investment but also whether or not the resources are likely to be sufficient for the maintenance of the rate of investment that will be required to keep pace with competitors’ innovations and expansion in its existing markets as well as in new ones. Even when an actor enters a new market on the basis of some discrete innovation and is able to ward off competition with its distinctive capabilities and other barriers, it must remain cognizant that it will be overtaken if it fails to develop its advantage.

7.2.5 Technology and innovation strategies?

Technological innovation is also an attractive strategic option, because the high returns that would accrue to both Cathay Pacific Cargo and Singapore Airlines Cargo can be justified as a due reward for entrepreneurial risk-taking (Franke 2007, p. 26). Technology is a critical driver of innovation and several types of technological innovation appear relevant for both Cathay Pacific Cargo and Singapore Airlines Cargo including advanced information technology solutions and new distribution systems (Franke 2007, p. 26). The air freight logistics industry consists of many actors. The principal actors are international air freight forwarders, airlines, integrators, warehousing and distribution firms, and cargo terminal operators. These actors work together to provide effective logistics management for client companies. Modern logistics management requires extensive volumes of information to be exchanged among the actors. Information exchange involving associated industries such as financial institutions and government agencies has also added to the diversity of handling information and knowledge in the world air freight industry (Chu et al. 2004, p. 1).

Information technology (IT) has been widely employed in logistics management and the global trend towards e-commerce and the use of IT is therefore significantly influencing the world air freight industry (Hui et al. 2003, p. 53). The integrators have led the world air freight industry in technological development. Firms such as FedEx and UPS were among the first to offer customers real-time electronic consignment tracking, either through dedicated electronic interchange (EDI) systems (which link shippers, international air freight forwarders, airlines, and customs authorities) and more recently the Internet. Consequently, other international freight
carrying airlines and the international air freight forwarders have been compelled to establish their own electronic tracking systems to meet this challenge (Bowen and Leinbach 2003). Singapore Airlines has responded to the growing air freight logistics industry for IT system capability by developing its ‘Freight Operations and Reservations System Computer’ (FORSC) system which enables clients to book and track air freight consignments online. In addition, SIA Cargo’s FORSC system is linked to Cargo Community Systems (CCS) in over 15 countries around the world; the CCS systems links customers directly to the FORSC system. This strategy makes it easier for customers to book and track their air freight consignments on a real-time basis (Lobo and Zairi 1999, p. 181).

Cathay Pacific Cargo also places a very high focus on IT systems, with its global operations underpinned by the ‘Cathay Uniysis Booking and Information for Cargo’ (CUBIC) computer system. CUBIC has been an integral part of Cathay Pacific’s cargo operations since 1984. The CUBIC system enables international air freight forwarders and shippers/consignees to access Cathay Pacific flight availability, monitor air freight consignment status and access Cathay Pacific’s flight timetable all in real-time. There are presently 426 CUBIC computer terminals in more than 65 sites located around the Cathay Pacific Cargo network (Cathay Pacific Cargo 2009, p. 1).

In February 2003, Cathay Pacific Cargo, together with Singapore Airlines Cargo, Qantas Freight and Japan Airlines Cargo, announced a new strategic partnership with the internet-based portal Ezycargo to expand their e-business capabilities (Hastings 2003, p. 22). In late 2003, Ezycargo commenced operations in Hong Kong, Singapore and Malaysia. The Ezycargo portal was also launched in Japan, New Zealand, India, Indonesia, Malaysia and China in 2004. In 2005, the portal was available in Taiwan and Thailand. The Ezycargo portal offers customers a wide range of generic and market specific online functions and improves visibility and efficiency of the air freight process (Cathay Pacific Cargo 2009, p. 1).

### 7.2.6 Branding as a strategic option?

Rumelt (1987, p. 147) argues that information asymmetry based on various types of branding and reputational effects is an isolating mechanism that can be used to enhance a firm’s strategic position. Branding is important both as a means of attracting a higher rate of return
through differentiation and as a means of developing a market presence in related product categories. It is a relatively costly and ephemeral means of restricting competitive pressure and it essential for a firm to optimize its return from expenditure on brand building (Cox et al. 2002, pp. 84-86).

Branding plays a crucial role in service companies because strong brands increase customers’ trust of the invisible purchase, given the inherent difficulty in differentiating products that lack physical differences. It is, of course, not possible to package and display air freight transportation services in the same way as a physical product. Even more important is the source of customer value creation (Normann 2002, pp. 37-38). Brand impacts moves from product to company as service assumes a greater role in determining customer value (Berry and Parasuraman 1991, p. 116). Brand building can develop reputation effects that enable a firm to achieve supply market closure in favour of preferred suppliers. Consequently, the degree of contestation in the market declines because buyers assume (often mistakenly) that there are only a limited number of firms capable of supplying products or services to the very high quality levels required. This supply market can be made more difficult by the relative superior competence of chain actors, who build into their standard operating practices an understanding of the requirement for constant innovation, rather than to rely on the imitation of what other firms are doing (Cox et al. 2006, p. 146). Sustainable business success requires therefore, that international airlines when providing air freight services ensure that their branding, marketing, sales and pricing strategies are correct so that they can effectively differentiate themselves from their competitors (Cox and Chicksand 2007a, p. 4).

A strong service brand is fundamentally a promise of future satisfaction. Service companies build strong brands through branding distinctiveness, by performing their core services well, and by associating their brands with trust (Berry 2000, pp. 129-130). The case interviews revealed that both Cathay Pacific Cargo and Singapore Airlines Cargo were recognized by both the shippers and the international freight forwarders as being high quality service providers. This market recognition could be further enhanced by both airlines through the development of their brands, also targeted at different market segments, such as Western Australia’s extremely large mining sector for Singapore Airlines Cargo, and Victoria’s rapidly growing pharmaceutical industry for Cathay Pacific Cargo, where service provider quality is regarded as exceptionally important due to the time-critical nature of the shipments being transported.
The development of a brand as an isolating mechanism may provide important commercial benefits for both Cathay Pacific Cargo and Singapore Airlines Cargo through differentiating services and underlining the high quality of service provided by the two airlines. These actions would enhance service competitiveness, influence the two airline’s price-elasticity of demand and create customer recognition and loyalty. They are also likely to create leverage for the two airlines over other supply chain partners and create long-term shareholder value (Adapted from Cox and Chicksand 2007b, p. 25).

PART B: STRATEGIC OPTIONS: A CHAIN DYNAMICS PERSPECTIVE

7.3 Airline Freight Carriers as Firms in Chains

There is no question that airline freight services, acting as firms in competitive markets, must create and sustain competitive advantage; and the strategic options outlined above offer a range of possibilities and actions.

But airline freight carriers, like other third party service providers, are firms which operate as elements in supply chains and chain structures and this thesis has argued, following Cox that it is the chain – not any one firm within it – that delivers value that is acceptable to the customer. In this perspective, therefore, it is the ‘efficiency’ of the chain which becomes a key issue in defining strategy.

7.3.1 Supply chain management and the integration of supply chains

The more recent supply chain management literature has focused heavily on the notion of an integrated supply chain and a great deal has been written on the ways and means of achieving integration.

Firms have become aware that in order to remain competitive they need to provide higher quality products and cheaper prices than their competitors. Consequently, firms have been required to not only improve production techniques but also to focus on the integration of supply activity with what customers demand (Frohlich and Westbrook 2001, p. 185). Ragatz et al.
(2002, p. 390) argues rightly, that by linking suppliers into a firm’s supply/value chains (to varying levels) is critical if the firm is to deliver superior value to the customer.

The literature suggests that there are two distinct tactical approaches to supply chain integration. The first has been referred to as ‘forward’ integration\(^3\), where the integration involves coordinating and integrating the supply chain from the supplier to the manufacturer and through to the end customer (Fawcett and Magnan 2002, pp. 345). The second type of integration is described as ‘backward’ coordination of information technologies; the information flows from customers to suppliers (Trent and Monczka 1998, pp. 6-7). Information flows in this direction enabling firms to respond directly to customer requirements and can be coordinated through multiple firms or networks. In order to achieve supply chain integration either backward or forward, the firm must have appropriate supply chain relationships in place (Choi et al. 2002, p. 119). This not only improves the flow of information in terms of customer demand; but it also enables the supply chain to respond in terms of higher value added products (Cousins and Menguc 2006, p. 607). The two models of integration are well-described by Reddy and Reddy (2001) and are often referred to more simply as supply push or demand pull models (Robinson 2009, p. 59).

The simple fact is that chain integration is a critical factor and Frankel’s observation in 1999 (Frankel 1999, p. 10) was, and remains, insightful ‘the time when shippers used an array of freight forwarders, truckers, clearance agents, transportation companies, and various financial, freight insurance and other institutions are gone. Today major customers demand and receive one-window integrated just-in-time and efficient all-inclusive door-to-door service at a predetermined price. This is what the market now demands”.

### 7.3.2 Integrating ‘disintegrated’ chains: the strategic challenge

Unfortunately, integrating chains is more easily said than done and, in the real world of day-to-day business, integration remains a key challenge. This thesis has adopted a particular perspective – that suggested by Andrew Cox – and has examined it in the context of the

\(^3\)This approach tends to be subsumed under the banner of just-in-time management, mass customization of the supply chain or for exploiting 3rd party logistics (Frohlich & Westbrook 2001, p. 186).
development of strategies for airline freight carriers. In this section we focus the discussion by assessing the hypotheses that provided direction for the study.

### 7.3.3 Integrated or disintegrated air freight chains

From the initial pilot study it seemed evident that air freight chains for perishable products – and in this instance, for rock lobsters – showed little, if any integration. In fact, the supply chains in which combination airlines participated appeared to be quite atomistic in structure with clearly segmented patterns of relatively independent logistics functions performed by multiple chain players. The study’s global hypothesis *That current air freight structures for perishable products are characterized by ‘disintegrated chains’, reflecting differing power relations in the chains* focused on this general issue.

In both case studies, it was apparent that there were two or more power regimes present in the chains, each driven by firms that were attempting to use their power position to leverage value from other chain players. This, in itself, has had a disintegrating impact on the chain and accordingly impacted the level of value appropriation by the actors participating in the chains.

Despite the fact that both case studies showed differing functional structures at the supplier-end of the chain, they both displayed the same basic power characteristics that sustained generically, three discrete power regimes in the overall chain structure. Thus, Figure 7.1 provides an ideal basis on how the case study chains can be analysed. It suggests that in the first power regime, the rock lobster fishers, fisherman’s cooperative and the exporter/processor have interdependent (=) relationships which forces the buyer and suppliers to share the value captured from the commercial exchange relationship (Cox et al. 2004). The figure also shows the air freight forwarder as being buyer dominant (>) over the international airline throughout most of the year as the available air freight space from Melbourne and Perth to Hong Kong typically exceeds the overall demand. As such, the air freight forwarder is in a position to leverage the airline in the second power regime (D > F) by exploiting isolating mechanisms, such as, information asymmetry and revenue support, and by minimizing their support of the airline’s services. This, in turn, impacts on the airline’s overall revenues, and, in many cases, results in the airline offering lower prices in order to secure air freight traffic. Interestingly, in
both cases, during periods of high demand for air freight space, the airline was able to leverage its power circumstances to capture lobster traffic, typically at a higher yield.

Also, as Figure 7.1 shows, the airline enjoyed buyer dominance (>), over their contracted aircraft ramp handling agents and cargo terminal operator in both power regime 2 and power regime 3. This is logical, as both aircraft ramp handling and cargo terminal operator are contractually bound to perform their customer airline’s air freight acceptance/processing and aircraft handling roles. The airline typically pays an all-inclusive fee on a flight-by-flight basis under the International Air Transport Association Ground Handling Contract (the length of the contract may vary from one to five years). Consequently, the cost of handling the airline’s freight and aircraft is the same regardless of the volumes of air freight and passengers carried. Due to recent advances in aircraft technologies, the current generation wide-body passenger aircraft, such as the Airbus A330-300 and the Boeing B777-300ER, provide airlines with substantial lower deck air freight space as well as the ability to uplift air freight loads of about 17 tonnes. Recently, airlines have exploited this greater air freight capacity/payload to capture greater value from their air freight operations. A consequence of this strategy is that the value capture for the airline is much higher than for the aircraft ramp handling agents and cargo terminal operators; hence in Figure 7.1 above, we show the airline as being able to leverage its power position to capture value from their respective handling agents. Figure 7.1 indicates that in the third power regime, the Hong Kong-based importer, who has buyer dominance (>), captures most of the value. The importer/trader is therefore able to exert control or influence over the exporter/processor.
The air freight chains examined in the study clearly demonstrated that two or more sub-power regimes exist in the chains and that the chains were disintegrated in structure. The finding supports Cox’s view that “all too often the level of integration cannot be achieved, because supply chains are typically characterized by power regimes that are inimical to an uninterrupted flow of value from raw goods suppliers to the end customer. As a result, the self-regarding efforts of the multitude of actors in complex chain networks to acquire value result in failed attempts at supply chain integration” (Cox et al. 2002, p. 74).

From Figure 7.1 it is evident that the three controlling power influences present in the chains are the Hong Kong-based importer/trader, the air freight forwarder, and the airline when acting as a buyer of services. Because most of the power influence stems from the sub-regime between the exporter/processor and the Importer/trader (I>C), the exporter/processor has little choice but to accept the conditions imposed by the importer/trader. During the non-peak periods for air freight space (in the peak air freight seasons the airline power position oscillates to one of supplier dominance), the airline in the second power regime also has to accept the conditions posed by the air freight forwarder (D>F). This is principally due to excess air freight capacity in the Melbourne and Perth to Hong Kong air freight markets and the strong competition between airlines attempting to capture air freight traffic and market share. The third observable power regime was that between the airline and their contracted aircraft ramp handlings agents and
cargo terminal operators in both Australia (F>E) and in Hong Kong (F>G; F>H). As previously noted, this is because international airlines have buyer dominance (>) when they source commoditized products or services, such as their air freight and ramp handling services, relative to a given standard.

The disintegrated structure of the chain presents a small number of players with the opportunity to exercise and leverage their power circumstances, and therefore, significantly influence the full value capture capabilities of the chain as a whole.

7.3.4 Disintegrated chains and strategy impacts

In contrast to the integrated carriers, who provide a fully integrated door-to-door service, airline air freight services have until now been essentially limited to an airport-to-airport product, primarily marketed by the air freight forwarding industry and often priced on a marginal or incremental basis. Does this mean, then, that disintegrated chains encourage or at least sustain an ad-hoc approach to strategy and strategic positioning – an approach which relies on short-term rather than longer term options? The first sub-hypothesis was stated, as a result of this thinking, that Disintegrated air freight chain relationships underlie current airline strategic options which tend to be ad-hoc in nature.

We have already noted that the international air freight market is now shifting to a position in which shippers demand complete logistics solutions rather than just turn over shipments to an airline for carriage from point A to point B. Thus, airlines are placed in a position where they need to customize their service offerings and create shipper-specific solutions. A way to achieve this is through the modularization of services, that is, offering a standard service, for example, time-definite airport-to-airport transportation plus value-added services, which address the specific requirements of the shipper in his or her present situation. These extra services will be value add-ons and warrant charging a premium rate. At the same time, since an airlines' core

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38 Note that in Case Study 2, Cathay Pacific has an interdependent (0) relationship with its aircraft ramp handling agent as the company operates as a fully owned subsidiary of the Cathay Pacific Airways Group. Also, in Melbourne, Cathay Pacific has awarded its air freight and aircraft ramp handling contract to a single supplier. In contrast, SIA Cargo has awarded its aircraft ramp handling and air freight handling contracts separately in both Perth and Hong Kong. As the case study evidence showed, SIA Cargo enjoyed buyer dominance (>) in both Perth and Hong Kong when awarding its contracts to the respective handling companies.
competency remains airport-to-airport transportation, door-to-door deliveries or site-to-site internal production logistics will require close cooperation between the airlines and 3PSPs so that the necessary infrastructure can be provided on the ground at a global level to ensure a high level of service quality (Herrmann et al. 1998, pp. 150-151).

Despite these changing market dynamics, both Cathay Pacific Cargo and Singapore Airlines Cargo air freight strategies were observed in the case studies to essentially focus on the provision of high quality airport-to-airport services. Such a strategy is not unusual, as relatively few airlines maintain significant direct relationships with shippers, instead relying upon international air freight forwarders to handle the door-to-airport and airport-to-door activities at each end (Forster and King 1995, p. 151). For both airlines, air freight is regarded as a strategic business activity and, as a result, the airlines have invested heavily in dedicated freighter aircraft, state-of-the-art air cargo terminals, and advanced IT systems. In both cases, however, the airlines were reliant upon the international air freight forwarder for business and received lower levels of value than had they provided a more integrated door-to-door service offering.

Moreover, the case interviews revealed that during ‘quiet’ times of air freight demand, the airlines are required to offer ad-hoc or spot pricing in order to attract business. Such a strategy also heavily influences their level of value captured. Interestingly, in both cases, the airlines negotiate the air freight rate for the Hong Kong destined rock lobster traffic at the commencement of each season. Such a strategy is designed to ensure that they capture a significant share of the available rock lobster traffic at yields which are deemed to be favourable. Neither airline, however, entered into formal contracts with the air freight forwarders for specified volumes of rock lobster traffic. Rather, the airline’s strategy was to deal with the air freight forwarder on a collaborative, but transactional basis. Due to the disintegrated chain structures and relationships, the airline’s level of value capture was quite small.

The study revealed that the disintegrated air freight chain relationships underlie the current airline strategic options adopted by both Cathay Pacific Cargo and Singapore Airlines Cargo in the supply chains examined. The two airlines air freight strategies often tended to be ad-hoc in nature. Nonetheless, it was also clear that both airlines treat their air freight services as a strategic business activity and have in recent times tailored their service offerings to include
additional value-added airport-to-airport products in an attempt to capture greater levels of value.

7.3.5 Value capture as a function of power?

The case study dynamics underlying each of the air freight chains summarized in Figure 7.2 show that the case study airlines (Cathay Pacific Cargo and Singapore Airlines Cargo) level of value capture was significantly restricted by their power circumstances and present air freight strategies. A second sub-hypothesis suggested That disintegrated chains limit power, and therefore, value capture, by airline freight carriers.

The research revealed that in both case studies the airlines had identical power positions ($D = / > F$) and their level of value captured was also similar. Singapore Airlines Cargo level of value captured was around 4-5 per cent net (Figure 7.3).

Figure 7.2. Singapore Airlines Cargo net return and power position vis-à-vis air freight forwarder.

In contrast, the Hong Kong-based importer/trader captured around 25 per cent net, and the air freight forwarder and exporter/processor earned around 10 per cent net. Case Study 2 showed that Cathay Pacific Cargo had similar power circumstances – and strategies – as Singapore Airlines Cargo, but earned slightly higher levels of value (5-7 per cent net) (Figure 7.3). The level of value captured by Cathay Pacific Cargo from its participation in the chain was around half of that earned by the Hong Kong-based importer/trader, the exporter/processor, air freight forwarder and the rock lobster fishers.
A key finding from the study's empirical research was that both Cathay Pacific Cargo and Singapore Airlines Cargo, when acting as suppliers of air freight capacity and services, typically have weak power positions, with only limited ability to leverage air freight forwarders and shippers. Such power circumstances impact on the level of value that these airlines can capture from participation in air freight chains.

The finding begs the question of whether or not the two airlines can move out of a position of weakness (that is, as suppliers they are dominated by the buyers of their services) to positions of greater power – and, in so doing, capture more value.

Recall that Cox et al. (2004) argue that, conceptually, firms operating as weak suppliers have a number of strategic options under conditions in which the buyer operates as a dominating player (see Figure 6.4). Cox identifies six such options (or ‘strategic routes’) and we note them again in this context.

- Route 1 – the direct route from buyer dominance to supplier dominance: Under this option the supplier must be able to move out of a highly contested market while deploying a key isolating mechanism to ensure the buyer(s) remain dependent;
- Route 2 – the route from buyer dominance to interdependence: The supplier must be able to reduce contestation in the market place by developing a longer term relationship with the buyer or buyers. In addition, the supplier needs to increase their switching costs to restrict access to alternate supply offerings;
- Route 3 - The route from Interdependence to supplier dominance: The supplier is able to increase sunk and switching costs post-contractually with the buyer to the level where it
creates a lock-in situation, or alternatively, through the development of an isolating mechanism;

- Route 4 - The route from buyer dominance to independence: The supplier may be able to reduce dependence on the buyer by working with less powerful buyers;
- Route 5 – The route from independence to interdependence: The supplier is able to offer buyers an increase in use value in return for a guaranteed long-term share of the buyer’s revenue;
- Route 6 – The route from independence to supplier dominance: The supplier is able to utilize information asymmetry to achieve above normal returns by deploying an isolating mechanism.

Note that in Chapter 6 (Section 6.3), Cathay Pacific Airways and Singapore Airlines enjoy a buyer dominance position when acting as buyers of services in chains. This is the most ideal position to occupy when acting as a buyer because the buyer has many ways in which to leverage value from suppliers – whether this is in the form of increased use value (functionality), or reductions in the total costs of ownership (by forcing the supplier to work for low, normal levels of profit), or both. The buyer can generally choose in this power position the type of relationship management style with the supplier that they prefer (Cox et al. 2004, p. 47).

However our analysis shows that both airlines positions when acting as suppliers of air freight services and capacity, have a position of interdependence (Figure 6.2). The following section takes this as input and examines the strategic options available to airlines to move from a position of relative weakness to a more favourable power position as suppliers and also enable them to capture and deliver greater levels of value.

Recall also, from Chapter 6, that Route 3 (from interdependence to supplier dominance) is available to both Cathay Pacific Cargo and Singapore Airlines Cargo to enhance their strategic leverage position when acting as suppliers of air freight services (Figure 6.2). Cox et al. (2004, p. 49) argues that there are two strategies available to actors seeking to improve their leverage position under Route 3 conditions. Under the first strategy, a supplier (Cathay Pacific Cargo and Singapore Airlines Cargo) should try to increase the sunk and switching costs post-contractually with the buyer to such a degree that complete lock-in enables the supplier (Cathay Pacific and Singapore Airlines Cargo) to premium price and achieve above normal returns from the buyer.
Such a strategy would, however, raise issues for Cathay Pacific Cargo and Singapore Airlines Cargo as they do not have any contractual arrangements in place with the buyers (international freight forwarders and the rock lobster exporter/processors). Furthermore, the switching costs for the air freight forwarders, rock lobster exporter/processors and the Hong Kong-based importer/traders are relatively low due to the absence of formal contractual arrangements and low switching costs. It is clear that the Cox strategy is not an option for the two case study airlines. Cox’s second strategy suggests that Cathay Pacific Cargo and Singapore Airlines Cargo (the suppliers) should develop an isolating mechanism in order to leverage their power circumstances. Buyer search costs are such an isolating mechanism. In supply chain procurement, search costs are incurred when an individual user in an organization looks for an appropriate product or service to acquire (Bakos 1997, p. 1677; Subramanian and Shaw 2002, p. 25). These costs include the opportunity cost of time spent searching, as well as associated expenditures such as driving, telephone calls, computer fees, and so forth (Bakos 1998, p. 36).

This isolating mechanism offers little strategic value to Singapore Airlines Cargo as the Western Australia to Hong Kong air market is served by a small number of very well established airlines. Furthermore, there are a few Western Australia-based air freight forwarders specializing in the handling of perishable cargoes and those that exist have considerable experience and knowledge of airline air freight services. Thus, freight forwarders when acting as buyers of air freight services from an airline operating from Perth to Hong Kong have virtually no buyer search costs. This effectively eliminates this type of isolating mechanism for Singapore Airlines Cargo. A similar situation applies in the Melbourne international air freight market, where despite the larger annual volumes of international air freight as compared to Perth, the perishables air freight market is serviced by a very small number of air freight forwarders who also have minimal search costs. In addition, these air freight forwarders are highly knowledgeable on both shipper requirements and airline operations. This rules out this strategic option for Cathay Pacific Cargo.

7.4 Strategic Options: a Final Note

In this chapter we have emphasized a point of view that suggests that defining strategies and strategic options for air freight carrying airlines must recognize that the airline is, in effect, a firm
competing against competitors in its marketplace but it is also a firm acting in a chain. It is incumbent on the airline, therefore, to be as competitively effective as possible – to be operationally effective and strategically well-positioned, in Porter’s terms. But it is critical, also, that it achieves a position in its myriad freight chains that ensures an efficient chain outcome for its customers and at the same time captures the value it seeks within its own business model.
CHAPTER 8: CONCLUDING COMMENTS:
INTERNATIONAL AIRLINE AIR FREIGHT STRATEGY IMPLICATIONS

8.1 Concluding Remarks

Australia’s international air freight services are characterized by two groups of service providers, often referred to as the integrators and non-integrators. The integrators’ business model not only focuses on the provision of a fully integrated door-to-door product offering but also on the provision of supply chain and logistics solutions, which are underpinned by highly advanced IT systems. The non-integrators’ model, on the other hand, relies on the provision of services by one or several air freight forwarders and a range of other firms to collect, store and consolidate freight as required and to book freight on scheduled combination passenger airlines to appropriate market destinations.

By far the largest volume of Australia’s international air freight traffic (about 90 percent) is carried in the lower deck belly-holds of the combination passenger airlines services. In this model the airlines carry air freight on an airport-to-airport basis and air freight forwarders, or in some cases, the end customers themselves, perform the associated logistics requirements. This suggests that a number of firms providing different functions, usually without any real degree of coordination or control, underlines a condition of chain ‘disintegration’ rather than chain ‘integration’ - and to that extent may impose a level of inefficiency on the chain. In recent years, the major integrators have captured substantial market share, not only in the express market segment, but also in the ‘traditional’ freight market, as more and more firms have found their service offerings attractive. As expected, this has had a detrimental impact on the revenue streams and profitability of the conventional carriers. This points to some concern on the part of the combination passenger and air freight carriers and highlights the need for a better understanding of the strategic options available to international airlines to capture greater value and competitive advantage from air freight transportation.

This study had focused on this issue - on how international airlines, operating combination passenger and freight services, deliver and capture value in international air freight transportation; and on identifying the strategic options available to them to enhance their power positions in international air freight chains or markets in which they participate.
Chapter 8
Conclusions

The study has argued that airlines involved in air freight operations may be conceptualized not only as firms operating in a market - effectively, competing against other airlines to secure a larger market share or greater revenues or profits - but also as firms operating in particular chains or supply chains serving particular routes and customers and seeking to ensure dominance and sustainability.

As firms operating in air freight markets, their strategic objectives might be seen as identical to those of any other firm operating in any market - essentially those that create and sustain competitive advantage in one way or another, as Porter noted in the 1980s. Traditionally, this has led to the adoption of one or a number of strategies that may involve cost-leadership, differentiation, a hybrid strategy that involves both cost leadership and differentiation, competitive diversification, innovation in production and process and the use of branding as a competitive strategy.

But airlines operate as firms embedded in chains of logistics (and other) activities that begin with the supplier and end with the final customer. The airline delivers value into the chain and captures value from it; but it is the chain which delivers the final value to the buyer. Simply, the value delivered by the airline to its customer is not only a function of the efficiency of the airline per se but it is conditioned or impacted by the efficiency of the chain.

How, then, do airlines, operating as firms in chains and supply chains, capture value from the chain or deliver value into it? And what strategic options are available to airlines in air freight chains to capture value? Cox and his associates at the University of Birmingham (2002, 2004) and the more recent work of Robinson (2009), who has particularized Cox’s notions in freight chains and chain systems, offer a particularly useful conceptualization. It has provided the analytical framework for this thesis.

Recall that Cox’s generic framework suggests that power relationships between supply chain actors significantly influence the level of value captured by the respective chain actors. A firm’s power circumstances are a function of its possession of critical assets and key supply chain resources; and supply chains are characterized by power ‘regimes’ which influence the ability of the firm to capture and deliver value. Importantly, the level of value that international airlines can capture from their participation in air freight chains is a function of the level of power between
the chain players and the way in which they work together (at arm’s length, for example, or collaboratively).

If value capture is a key objective for an airline operating in air freight chains then its strategic options will recognize the importance of power in integrating chain operations across a number of firms in power regimes or sub-regimes; and it will seek to exploit that power in order to move from a position of relative weakness to one of strength and dominance.

This study chose to examine these issues in some detail in two case studies of air freight chains delivering high value, perishable seafood products from Australia into the Asian market - more particularly, the Melbourne and Perth to Hong Kong rock lobster air freight chains. Rock lobsters are a high per unit value and a quality, high demand, perishable product that is much sought after in Hong Kong, Australia’s largest rock lobster export market. Importantly, air freight is the primary transport option for these products.

Each supply chain (the Melbourne to Hong Kong chain, based on the southern rock lobster and the Perth to Hong Kong chain, based on the western rock lobster) provided the focus for an in-depth case study. Each study detailed the functional, corporate, contractual and regulatory structures in the chains; and further analysis revealed the power relationships and power regimes present in the chains as well as the levels of value captured by individual players. In addition, attention was focused on particular aspects of the case study airlines (Cathay Pacific and Singapore Airlines) - including their air freight strategies, the value appropriation outcomes and alignments as buyers and in the chains. The analysis provided, as we noted in the previous chapter, the essential elements for empirically testing the set of research hypotheses.

The case studies provided, as expected, new and valuable insights into how rock lobsters are shipped to Hong Kong; but, importantly, the findings of the study confirmed that the conceptual framework provided a robust, incisive and sound framework within which critical issues about power circumstances and levels of value capture could be effectively examined and understood. The research showed that Cox’s framework can be usefully applied in real-world contexts and his simple power matrix is sufficient to demonstrate the nature of power relationships and power regimes in real world air freight chains. Value capture is critical to firm success; but Cox’s note that ‘one of the major challenges of supply and value chain mapping is the acquisition of
meaningful data on profit margins’ (Cox et al. 2002, p. 174) can provide particular difficulty for researchers using his framework. In this study, industry experience and a high level of industry cooperation and interest in the research provided acceptable insights into the issue of value capture.

The research showed that when acting as buyers of air freight related handling services, international airlines typically enjoy a position of buyer dominance. However, when acting as suppliers of air freight capacity, international airlines’ power circumstances oscillate between supplier dominance and interdependence, depending on the seasonal demand for air freight services. The level of value captured by international airlines in air freight transportation is therefore restricted by their current strategy of limiting their service offerings to airport-to-airport transportation. Furthermore, and most importantly, the study found that the supply chains were disintegrated in structure and that Cathay Pacific Cargo and Singapore Airlines Cargo occupied relatively weak power positions when acting as suppliers of air freight services and capacity.

The study findings suggest that whilst value capture is regarded as an important objective for air freight carrying airlines, a strategy based on the recognition of their power circumstances and exploiting critical assets will enable them to leverage improvements in their relative power positions in chains to capture increased value and higher margins (Cox et al. 2002; Robinson 2009). Thus, the really important strategy for airlines participating in air freight chains is that of ‘integrating’ on the basis of power, by extending their control over critical assets and participation in the chain. Accordingly, in air freight chains, the critical strategic objective for airlines when acting as a supplier of air freight capacity and services is to position or leverage their power circumstances so as to occupy a supplier dominant position (Cox et al. 2002). This is especially important when airlines occupy weak power positions in air freight chains when acting as a supplier of air freight services. In order to achieve this objective, airlines can implement strategies such as cost leadership, differentiation or diversification into additional value-adding services/products strategies, which will enable them not only to better integrate the chain and satisfy shipper requirements but also secure greater control in the dyadic and multi-dyadic regimes present in the chain. Furthermore, an important finding of this study is that airline air freight managers concerned with defining their strategic options must recognize that they are not only competing in markets but also in chains; and further, that the airline does all its business in, and earns its revenues and profits from operating in specific supplier-buyer chains.
Moreover, in order to more successfully compete against their integrator rivals, airlines need to move their strategic focus from airport-to-airport transportation to one which focuses on better satisfying shippers’ requirements for end-to-end logistics solutions. The strategic options identified and discussed in the previous chapter will, if adopted by airlines, enable them to address this requirement through the provision of more customer-focused and customized service offerings, in so doing providing the opportunity for greater value capture.

The study findings have important implications. They underline the notion that satisfying shippers’ requirements for end-to-end logistics solutions is the basis on which effective international air freight carrying airlines strategies should be defined; and that understanding their power positions and relational management circumstances as buyers and suppliers is critical to their strategy definition and their ability to capture and deliver value.
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Appendix 1

The Key Actors in the World Air Freight Industry
The Key Actors in the World Air Freight Industry

Air freight service providers are a heterogeneous group who offer a diverse range of services and different levels of logistics expertise (OECD 1999, p. 6). Broadly speaking, they may be grouped into four principal categories: international air freight forwarders, all-cargo carriers, integrated express carriers and combination passenger airlines (Hebert et al. 1998b, p. 116). The four service provider segments offer a different range of services and products; however, some of these may overlap as each stakeholder typically performs one or more complementary function (Nyshadham and Raghavan 2001, p. 248). Services include not only the physical handling of the consignment but also the technological ability to gather and disseminate information, as well as provide customers with both pre- and post-flight customer service (Hebert et al. 1998b, p. 116).

However, two organizational structures dominate the provision of air freight services: integrators and non-integrators – air freight forwarders and scheduled combination airlines that provide air freight services through their coordinated efforts (Forster & Regan 2001, p. 47). Air freight logistics services therefore include both the airport-to-airport transportation of goods performed by airlines together with the air logistics services performed on the ground, typically by air freight forwarders (Bowen and Leinbach 2003, p. 312; Spohrer 2003, p. 5). Air logistics services include, for example, road transport from a client's manufacturing plant to the airport together with highly customised services that utilise information technology and airport-adjacent third-party warehouses to facilitate the distribution of finished goods and minimise the inventory of component parts (Leinbach and Bowen 2004, p. 300).

- Combination Passenger Airlines

The technological beginning of the global air freight industry is based on the circumferential design of aircraft hulls. As a by-product of the aircraft fuselage design, air freight space is created below the passenger compartment where passenger baggage, postal mail, and air freight are carried (Dempsey & Gesell 1997a, p. 401). Combination airlines can be: (1) combination passenger and cargo operators who only use belly-hold capacity in passenger aircraft, for example, Virgin Atlantic Airways; (2) combination passenger and cargo operators who use both freighter aircraft and the belly-holds in
passenger aircraft to transport air freight, for example, Air France/KLM and Cathay Pacific Airways; or (3) all cargo airlines moving only freight in dedicated freighter aircraft, for example, Cargolux in Europe and Nippon Cargo Airlines in Japan. Historically, in traditional distribution the only activity that combination airlines perform is flying air freight consignments on an airport-to-airport basis (Christiaanse et al. 1995, p. 7; Christiaanse and Huigen 1997, p. 81).

By convention, airlines do not normally deal directly with customers (Bowen and Leinbach 2004, p. 174). The principal reason that airlines do not deal directly with exporters is that in many cases they do not have the staff or the facilities to accept the product and prepare the documentation necessary for export (Australian Freight Councils Network 2000, p. 3). Consequently, to function in the international air freight business, an airline typically works closely with international air freight forwarders who serve as the intermediary with shippers and consignees (Forster and Regan 2001, p. 48).

- **Integrators**

The integrated carriers, or express carriers, provide a total service, including freight collection and delivery, transportation, customs clearance, documentation processing, computer tracking of individual shipments and invoicing (Doganis 2002, p. 313). They utilise dedicated, extremely efficient multimodal transport networks. For higher speed and reliability, they own and operate (most off) their own freighter aircraft, trucks, other surface transportation equipment and automated hub handling and storage facilities (Weidemeyer 1995, p. 72). The integrators normally deal directly with customers circumventing the role played by air freight forwarders (Bowen and Leinbach 2004, p. 174).

- **International Air Freight Forwarders**

International air freight forwarders provide the full link between shippers and consignees, from surface point to surface point (Ohashi et al. 2005, p. 150). They contract with airlines for the physical carriage of goods, purchase block air freight space on their flights, consolidate freight from multiple shippers, and operate – or contract with – complementary surface transportation service providers (Al Hajri 1999, p. 200; Grin 1998, p. 83). Due to
Appendix 1
International Air Freight Actors

Economies of scale, international air freight forwarders are able to offer ‘consolidation’ services that are often cheaper than those which the exporter could negotiate directly with the transportation provider (Corley 2002, p. 17; Shedd 2003, p. 16). Other services provided by air freight forwarders on behalf of the shipper include, customs brokerage, transport insurance, warehousing and distribution, loading airline air cargo containers (ULDs), documentation, banking requirements, trucking (pick-up or delivery) (Bruins 2000, pp. 2-3), air freight space reservations for shippers, documentation preparation, and in some instances, shipment packing and cargo insurance (Corley 2002, p. 16). In addition, international air freight forwarders may manage, under contract, some of the downstream production functions of a supply chain, offering services in warehousing, quality control, inventory control and just-in-time delivery operations of firms, often large multinationals (OECD 1999, p. 18; Wan et al. 1998, p. 202).

Air freight forwarding services can therefore be separated into three broad classes on the basis of functional complexity: traditional air freight forwarding, integrated logistics, and supply chain management. At the lowest level, one finds traditional air freight forwarding in which air freight forwarders mediate between the airport and the customer’s premises, taking care of ground transport, securing capacity from the airline, and customs clearance. At the intermediate level, firms performing integrated logistics services supplement the basic air freight forwarding with a range of value-added services. Larger air freight forwarders have introduced value-added services both in the management of components feeding into a manufacturer’s production system and also in the management of the final products, for example, air freight forwarders often provide simple pick and pack, assembly, and testing operations on behalf of clients. Finally, at the highest level lies supply chain management in which the air freight forwarder assumes the lead in designing and implementing specific supply chain solutions that are underpinned by customised information systems, becoming in the industry parlance a ‘lead logistics provider’ (Bowen and Leinbach 2004, pp. 175-177).

- **The Air Cargo Terminal Operator (CTO)**

The air cargo terminal operator provides the handling facilities necessary to accept air freight consignments from international air freight forwarders and shippers; check shipment weights; and prepare aircraft load plans. They also store the consignment until it
has been cleared for export by customs or held for at least 24 hours at the terminal for security reasons (Damsgaard 1999, pp. 304-305). The terminal operator then arranges for the consignment to be loaded on the designated aircraft (Ashford et al. 1997, p. 291). At the destination, an air freight terminal operator accepts freight from incoming flights and stores the freight until it has been cleared and released by the receiving country’s customs authority. A freight forwarder then typically thereafter collects the consignment and arranges delivery to the consignee (Wan et al. 1998, p. 202).

- **The Aircraft Handling Operator**

The aircraft handling operator handles the physical movements while the freight is inside the airport. Operator personnel collect the freight from the CTO operator and have the responsibility of loading the freight on to the correct aircraft. At the destination, they unload the aircraft and deliver the incoming consignments to the airline’s contracted CTO’s terminal (Damsgaard 1999, pp. 304-305).

- **The National Customs Authority**

The primary tasks of National Customs Authorities are to examine, tax and control the movement of international freight (Christiaanese et al. 1996, p. 420). Customs authorities perform two basic functions: trade facilitation and customs control. The latter includes prevention of illicit or other hazardous substances, intellectual property rights protection, and in particular, tariff collection (Zhang 2003, p. 89). Customs authorities normally receive an application for export approval from a shipper or a freight forwarder on his behalf. After checking the application customs issues an export clearance authority. Similarly at the receiving country, customs receive an application for import clearance and, when issued, the air freight terminal operator may release the consignment into the custody of a freight forwarder (Damsgaard 1999, p. 305). Consequently, national customs regulations and procedures significantly influence the international air freight distribution system as delays in customs clearance of consignments negatively impact the speed benefits associated with the use of the international air freight mode (Christiaanese et al. 1996, p. 420).
The Shippers and Consignees

Shippers and consignees are the principal consumers of air freight services as together they form the parties demanding the air freight services. The shipper may be a company or an individual, exporting either general or perishable freight. The shipper, the owner of the goods, establishes the initial link in the air freight chain (Damsgaard 1998, p. 46). This function may be performed by the manufacturer, the merchandise-holder, or the importing or exporting firm. The primary objectives of the shipper are to ensure customer (consignee) satisfaction and to limit the length of time assets are immobilised. Where a shipper is also a manufacturer, then a secondary objective is often for the company to concentrate on their core business activities, and thus, sub-contract value added services, such as, shipping, product distribution, assembly lines, delivery and customer service functions to other vendors (The International Air Cargo Association 1998, pp. 4-5).

The importer or consignee is the receiver of the goods. An importer may be a company or an individual. The importer is normally responsible for the destination processes, such as, customs clearance and product distribution (Victorian Air Freight Council 1997, p. 8).
Appendix 2

The Case Study Protocol
THE CASE STUDY PROTOCOL

1. PURPOSE OF THE CASE STUDY PROTOCOL

(A) Objective

The objective of this case study protocol is to establish a uniform research methodology to conduct the case studies including the required field procedures, the data collection procedures, and the case reporting formats. The aim of this case study protocol is to balance flexibility in terms of how the researcher conducts a case study with the objective for consistency across the different case studies. The protocol should be viewed as a set of minimum requirements for the researcher, other formats are possible.

The goal of the study is to empirically test the study's conceptual framework in the context of the Victoria and Western Australia to Hong Kong live rock lobster export air freight markets through the use of two in-depth case studies:

Case Study 1). A Western Australia to Hong Kong live western rock lobster air freight chain based on Singapore Airlines Cargo.

Case Study 2). A Victoria to Hong Kong live southern rock lobster air freight chain based on Cathay Pacific Cargo.

Both Victoria’s and Western Australia’s rock lobster industries were selected for study as they are a major user of the international air freight mode and the annual value of these two State’s rock lobster exports accounts for around 74 per cent of Australia’s annual rock lobster exports to Hong Kong, the country’s most valuable rock lobster export market.

(A1) THE STUDY’S RESEARCH HYPOTHESES

This thesis focuses on the strategic options available to international airlines to deliver and capture value in international air freight chains and markets, and thereby, achieve and sustain competitive advantage. More particularly, the research problem is informed by Cox's (2002, p.74) view that control and coordination in supply chains is especially difficult 'because supply chains are characterised by power regimes that are inimical to an uninterrupted flow of value from the end customer to raw material providers'- that it is, in
fact, ‘the self-regarding efforts of the multitude of actors in complex supply chain networks to appropriate and accumulate value’ that prevents the full integration of chains.

Further, the thesis argues that airline carriers operating in international air freight markets – like other third party service providers and firms more generally – seek to move, in strategic terms from a position of relative weakness in their supply chains to a position of strength.

- The **global hypothesis** of the study is *that current air freight structures for perishable products are characterized by ‘disintegrated chains’, reflecting differing power relations in the chains.*

**Two sub-hypotheses have also been proposed:**

- *Disintegrated air freight chain relationships underlie current airline strategic options which tend to be ad-hoc in nature; and*
- *That disintegrated chains limit power, and therefore value capture, by airline freight carriers.*

(A2) **UNIT OF ANALYSIS**

In the present study, the primary unit of analysis is the Victoria and Western Australia to Hong Kong live and processed rock lobster export air freight markets. Sub-units (cases) are the two discrete rock lobster export air freight chains from Victoria and Western Australia to Hong Kong) and the strategic options that will enable international airlines to deliver and capture value in the air freight chains in which they participate.

(B) **CASE STUDY METHODOLOGY AND DATA COLLECTION PROCEDURES**

(B1) **Single Case Study Design**

(1). Treat each of the cases as a replication, not as a single response to a survey.

**Not** sampling.

(2). Write up each case individually – develop a standard case format.

- Content analysis
Study implications

(3). Do overall write up of the case study findings based on the content analysis and inferences.

(B2) Sample Selection

(1). International airline and air freight forwarding firms (3PSPs) who are involved with the air freight transportation of Victorian and Western Australian rock lobster (live/processed) shipments to Hong Kong, the State’s two major rock lobster export markets. The study will also include Victorian and Western Australian based rock lobster exporters and the cargo terminal operators who handle the rock lobster air freight shipments on behalf of their contracted international airlines. The reference sources for the identification of potential participants are the Lloyds List DCN 2007 ‘Directory of Australian Shipping, Air, Road, and Rail Services’ and the 2005 Air Cargo Australasia Directory.

(2). Firm cooperation:
2-3 executives involved in the strategy definition process who would be willing to share their insights into their firm’s strategy definition processes and share samples of internal documentation. For each firm participating in this study, a completed summary is to be reviewed by the key informants. This will allow the informants to correct any errors of fact, and supply alternative feedback to those the researcher had made if necessary (Miles 1979, p. 597).

(Note: multiple data sources are necessary to enhance the study’s validity and reliability).

(B3) Data Collection Plan

In accordance with the Griffith University ethics policy, written consent must be obtained from each individual and company prior to the case interviews being carried out. Individuals to be interviewed were identified as part of a priority list. A schedule of appointments was prepared in advance to minimize appointment cancellations or postponements.
The data collection procedure employs a set of questions that serve the researcher as a tool and guide when undertaking data collection for the respective cases. The researcher should review the study’s questions prior to commencing the cases.

C. BASIC OUTLINE OF THE CASE STUDY REPORT

The tentative format of the case report (as below) was planned beforehand, so that the information collected was tailored towards meeting the case study report format. However, the format of the report was not fixed and could be changed as necessary. The report included single case write-up together with cross-case comparison. A copy of the case report was sent to firms who participated in this study (Rahim and Baksh 2003, p. 33).

- Case Name
- Case Background
- Characteristics and supply of the raw material
- Characteristics of End-Users
- Mapping the Supply Chain (Functional, Corporate and Contractual chain structures)
- Government Regulatory Influences on the Chain Structures
- Mapping the Value Chain
- Revenue Shares within the Chain
- The Distribution of Margins with the Chain
- Value Distribution and the Competitive Dynamics of Exchange
- Understanding the Airlines’ Competitive Strategy Options
- The Alignment of Airlines’ Buyer and Supplier Relationships
- Case Summary

D. PILOT STUDY

(1). Select a firm that is located nearby – accessible/congenial informants, good access to documentation. **Note**: Yin (2003, pp. 78-79) refers.

(2). Not a ‘pre-test’, help refine data collection plans with regards to content/procedure.

(3). Write-up: content/procedural implications.
E. GATHERING CASE EVIDENCE – FIELD PROCEDURES

**Note.** In accordance with the Griffith University ethics policy, written consent must be obtained from each individual and company prior to the case interviews being carried out.

(1). **Three essential criteria**

(1). Multiple sources of evidence – any 2 or more (that is, interviews, archival documents, records, observation) converging on the same facts.

(2). Utilize a case study data-base – make information traceable, store in a secure/confidential place.

(3). Chain of evidence that links the questions asked, data gathered and the conclusions drawn (**Note**: Yin 2003, pp. 105-106).

(2). **Sources of evidence**

(a). **Documentation**

- Internal memos and organizational manuals, reports, business plans, press releases, company announcements, annual company reports
- Proposals, presentations, formal studies, news clippings
- Corroborate/supplement other evidence. Specifically:
  - (1) Documentation on the firm’s strategy definition process and value capture/delivery strategies.
  - (2) Internal company documentation related to the firm’s strategy definition process and value capture/delivery strategies.

(b). **Archival Records**

- Copy of the firm’s organization chart
- List of services/products offered by the firm

(c). **Interviews** – (**Note**: Key source of information)

- Key informants – open-ended, semi-structured interview focusing on strategy definition and strategies employed to deliver and capture value – corroborate with evidence.
The selection of the study's informants should follow Campbell’s (1955, p. 339) selection criteria, which means the person or persons to be interviewed have to be “well informed and exceptionally observant” as well as “communicatively gifted”. Whilst job descriptions and titles may vary widely by company, in this study it is recommended that the highest ranking executives or managers that are directly involved with their firm’s strategy definition process be selected for the case interviews. Their generic titles are typically “Director”, “Export Manager”, “Cargo Manager” or “Sales Director”. It is recognized that other position titles are, however, possible.

Focused interviews: informant is interviewed for a short time period (60-90 minutes); certain set of questions (interview guide) – may or may not be open ended questions.

Interviews to be conducted at interviewees premises unless otherwise agreed.

Interviews to be tape-recorded with interviewees’ permission. Field notes will also be taken.

The tapes/field notes will be transcribed and summarized by the researcher. Summaries to be returned to the informant concerned for agreement.

Archival data and other published information to be gathered as appropriate to ensure triangulation and study validity/reliability.

(d). Direct Observation

Visit ‘field-sites’ – informal data gathering, observe the application of the services implemented from the firm’s strategies.

(e). Establish the Case Study Data-base

Case study notes (interviews and document analysis)

Case study documents collected, including any field notes explaining the documents

(Note: important pages from non-confidential documents are to be photocopied with consent for subsequent analysis.

Tabular materials

Narratives

(Note: purpose is to improve the case study reliability).

Source: Adapted from Ellram (1996, pp. 120-122); Yin (2003, pp. 64-77).
F. EXPECTED PREPARATION PRIOR TO SITE VISIT

Prior to the interviews and the site visits a list of potentially accessible documents was compiled (see 2a above). A background search of the participating companies in trade journals, on the Internet, or within industry reports was undertaken to provide the researcher with a better understanding of each company’s operations. A visit to the each participant’s sites was requested and questions related to strategy definition were asked (Rahim and Baksh 2003, p. 33).

F. DATA ANALYSIS – OVERALL PROJECT

The first stage in the data analysis process is to produce transcripts from the case study interview recordings. One detailed transcripts have been produced and verified against the tape recordings, responses from the participating actors were grouped into respective categories, with those used for each type of interview closed linked for ease of analysis.

In order to identify the categories an inductive content analysis of the interview data was undertaken. This process involved reading through the case interview transcripts focusing on emerging themes, particular characteristics or qualities, unanticipated messages and meanings, fruitful lines of enquiry, or possible areas for deeper study. Following this analysis categories were assigned and texts allocated to these discrete categories.

The categorization of the interview data allowed for ease of access to excerpts from various case interview transcripts relating to a particular topic and enabled common themes and responses between interviews to be effectively identified, enabling conclusions to be drawn and common explanations to previous findings to be recognized.

Case study research involves the use of multiple data sources. In addition to the case interviews, archival data, documents and records were therefore analysed in a similar manner where key themes were searched and then marked for extraction under the categories identified from the analysis of the case interviews. The categories are manifested in the case study headings (see Chapters 4 and 5) with the archival data and documents being further used to provide case background material and introduction to the case.
The content analysis undertaken in the study was guided by the recommendations of Golicic and Mentzer (2005), Krippendorff (1980), and Weber (1990) among others.
Appendix 3

The Study’s Participant Information Sheet and Consent Form
“Restructuring Air Freight Chains: Strategic Options for Competitive Advantage”

INFORMATION SHEET

Team conducting the research:

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The Reason for this Research:

There continues to emerge new, rapidly restructuring market places for air freight and air freight related firms. These are marketplaces in which the consumer of freight transportation services is increasingly demanding end-to-end services at acceptable time, quality and cost levels. In short, freight moves only because it creates competitive advantage and value to supplier, buyer and third party service providers (3PSP's), and it moves in physical and logistics pathways that deliver value. The existence of power, and power regimes and sub-regimes will, however, constrain seamless operations and both value delivery and value capture.
This research will examine the applicability of Cox’s\(^{39}\) (2002, 2004) conceptual frameworks for understanding air freight movement and, particularly the role of 3PSPs, and is one which interprets air freight as moving in value driven chains, on an end-to-end sustainable basis.

**What Participants will be requested to do:**

The researcher would like to request an interview with the Chief Executive Officer or a Senior Executive to ascertain responses to a series of semi-structured and open-ended descriptive questions primarily relating to perishable air freight chain structures, functionality, corporate linkages, processes, and a measurement of value capture in perishable air freight chains. The researcher is undertaking an in depth case study that involves the detailed process mapping of perishable air freight chain structures and chain pathways; the definition of power structures in perishable air freight chains; and value capture mechanisms in perishable air freight chains.

In addition, the researcher would like to view non-confidential material, such as training manuals, company brochures, key regulatory body compliance manuals, and reports in order support the interview process. It is stressed that the findings will not be disclosed to other third parties nor will the participants (company name and interviewees) details be released to any third parties.

**The Basis by which Participants will be selected for participation in the Study:**

Participants selected for inclusion in this study are key influential decision-makers involved in perishable air freight chains. The key informants have been selected based on their degree of responsibility and authority concerning the selection of air freight chain logistical pathways, third-party service capabilities, and their strategy definition and implementation roles. The selection of the key informants is critical in order to enable the researcher to identify, map, and describe the value-creating relationship dimensions, logistics pathways, strategy definition, and corporate linkages of the firm’s involvement in perishable air freight chains.

The Expected Benefits of the Research:

Porter's\textsuperscript{40} (1990) seminal work on strategy underlined the critical importance of competitive advantage, of operational effectiveness, of strategic positioning, the value chain, and of the uniqueness of the firm. Slywotzky's\textsuperscript{41}(1996) useful insights into value migration and value capture have been important. But, Cox's (2002, 2004) work has been crucial in underlining the importance of power in structuring supply chains and in eroding or adding value.

This project extends Cox's thinking to strategy formulation by international air freight chain participants participating in Victoria and Western Australia to Hong Kong live rock lobster export air freight markets. By so doing it significantly clarifies the basis of power relationships in the operational effectiveness of air freight chains. Few research studies have focused on such relationships within airfreight chains.

This study is important not only because it is the first to Cox's conceptual framework to international air freight chains, but also because it will provide a more adequate understanding of the power relationships between international air freight chain participants and how these relationships impact on their respective strategies, and hence, the firm's ability to capture and deliver value.

Risks to you:

There is no intention to divulge neither company name nor the names of particular individuals obtained from any interviews unless explicit approval is obtained, nor will any information be used that could be construed as negative toward any particular individual or company. Therefore, it is believed that there is no risk associated with your involvement in this study.

\textsuperscript{40}Porter, M 1990, \textit{The competitive advantage of nations: creating and sustaining superior performance}, The Free Press, New York, USA.
Your Confidentiality:

The participant’s confidentiality will be respected at all times and care will be taken to de-identify persons and companies in the case report. In addition, the audio tapes of the interviews will be erased following transcription and analysis.

Your Participation is Voluntary:

The participation in an interview is of course purely voluntary. Should a participant not wish to answer all or part of a question, they are not required to do so. Indeed, a participant is free to withdraw at any time from the interview process.

Further Information:

The researcher is Mr Glenn Baxter who can be contacted on 0412565584 should the participant require any additional information. The principal supervisor for this research is A/Professor Paul Bates, Head of the School of Aviation, Griffith University (Tel (07) 3875 5358) and is also being co-supervised by Professor Ross Robinson; Executive Director, The Australian Centre for Integrated Freight Systems Management, Melbourne University Private (Tel: (03) 9810 3253).

Ethical Conduct of this Research:

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Research involving Humans. If potential participants have any concerns or complaints about ethical conduct of the project, they should contact the Manager, Research Ethics on (07) 3875 5585 or research-ethics@griffith.edu.au.

Feedback to Participants:

A copy of the applicable case study can be made available after completion if requested by the participant. Transcripts of the interviews will be provided to each of the subjects to review in
order to permit respondents to correct any errors of fact, and supply alternative feedback to those the researcher had made if necessary.

**Privacy Statement:**

The conduct of this research involves the collection, access and / or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University’s Privacy Plan at [www.griffith.edu.au/ua/aa/vc/pp](http://www.griffith.edu.au/ua/aa/vc/pp) or telephone (07) 3875 5585.

**Expressing Consent:**

By signing the attached consent form, the participant will be deemed to have consented to their participation in the research.
“Restructuring Air Freight Chains: Strategic Options for Competitive Advantage”

CONSENT FORM

Research Team:

Student: Mr. Glenn Baxter - PhD Candidate
Supervisor: A/Professor. Paul Bates
School: School of Aviation, Griffith University (Nathan Campus), Brisbane, QLD 4111
Phone Contact: 07 3875 5358
Email contact: Glenn.Baxter@student.griffith.edu.au

By signing below, I confirm that I have read and understood the information sheet and in particular have noted that:

- I understand my involvement in this research will include an interview/meeting to discuss perishable air freight chains structures, functionality, corporate linkages, processes and perishable air freight chain value capture mechanisms.
- I have had the questions answered to my satisfaction;
- I understand the risks involved;
- I understand that there will be no direct benefit to me from my participation in this research;
- I understand that my participation is voluntary,
- I understand that if I have any additional questions I can contact the research team;
- I understand that I am free to withdraw at any time, without comment or penalty;
- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 07-38755585 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and
- I agree to participate in the project.

Name: ..............................
Signature: ..............................
Date: ..............................
Appendix 4

Australia, Hong Kong and Industry Regulatory Influences on the Victoria and Western Australia to Hong Kong Rock Lobster Air Freight Markets
AUSTRALIA, HONG KONG AND INDUSTRY REGULATORY INFLUENCES ON THE VICTORIA AND WESTERN AUSTRALIA TO HONG KONG ROCK LOBSTER AIR FREIGHT MARKETS

1. Australian Government Regulatory Requirements

*Aviation Transport Security Act 2004 (Cwlth)* and *Aviation Transport Security Regulations 2005 (Cwlth)*: These acts came into force on the 10th March 2005 and are monitored and enforced by the Department of Transport and Regional Services (Department of Transport & Regional Services 2004, p. 5). These acts stipulate that any businesses that security clear, handle or make arrangements for the transport of international and domestic air freight that has been security cleared must be a Regulated Air Cargo Agent (RACA) (DOTARS 2007a, p. 1).

In Australia, RACAs include air freight forwarders and cargo agents, CTO’s, express/courier firms, and road transport operators who transport air freight (DOTARS 2007b, p. 1).

RACA’s are responsible for:

- Developing and implementing Transport Security Programs (TSP) based on thorough risk assessment of their operations;
- Security checking, and protecting the security of all air freight until it leaves their possession; and
- Providing their employees with skill based training (DOTARS 2007a, p. 2).

*Civil Aviation Act 1988 (Cwlth)*: This act establishes the Civil Aviation Safety Authority and its functions, and provides for the regulation of, and licensing provisions in relation to, civil aviation (Pengilley and McPhee 1994, p. 349). The *Civil Aviation Regulations (CAR) 1988 (Cwlth)* and the *Civil Aviation Safety Regulations 1998 (Cwlth)*, made under the authority of the *Civil Aviation Act*, provide for general regulatory controls for the safety of air navigation. The *Civil Aviation Act* and CAR 1988 empower CASA to issue Civil Aviation
Orders on detailed matters of regulation. The CASRs 1998 empower CASA to issue Manuals of Standards which support CASR by providing detailed technical information (Civil Aviation Safety Authority 2007, pp. 1-2).

Part 92.005 ‘Applicability’ of the CASR regulations sets out for Section 23 of the Civil Aviation Act 1988 (Cwlth) (the Act) the conditions under which an aircraft may carry dangerous good and a person may carry dangerous goods, or consign dangerous goods for carriage on aircraft; for Section 23A of the Act, the requirements for the statement to be made in respect of cargo consigned for carriage on an aircraft; and for section 23B of the Act, the requirements for training of persons involved in handling cargo carried or consigned for carriage on an aircraft (Civil Aviation Safety Authority 2004, p. 3). CASR Part 92 prescribes the minimum safety requirements for the consignment and carriage of dangerous goods by air. It includes training, documentation, record keeping and incident reporting as well as provisions for packaging, marking, and the loading of and stowage in aircraft. Section 92.100 of CASR stipulates the dangerous good training requirements applicable for ground handling staff (cargo and ramp handling). Section 92.105 of CASR stipulates the dangerous good training requirements applicable for international air freight forwarding staff accepting or handling export cargo (Civil Aviation Safety Authority 2004, p. 19).

Customs Act 1901 (Cwlth): Part VI of the Customs Act 1901 (the Act) provides the legislative basis for the Australian Customs Service (ACS) control over the exportation of goods. The exportation of goods may be prohibited absolutely, prohibited to specified places, or prohibited unless prescribed conditions are complied with. All goods being exported from Australia must be reported to the ACS before being loaded onboard the ship or aircraft in which they are being exported (Australian Customs Service 2006, p. 10).

International air freight forwarders are permitted to operate a Section 77G depot. Prescribed warehoused goods for export from, or returning to a, a licensed Section 77 warehouse must be electronically reported to the ACS on a warehouse release or warehouse return notice respectively (Australian Customs Service 2006, p. 49). The CTO is required under the act to report to report the receipt of the goods being received for export. Once the ACS has been notified of the arrival of the goods, the ACS will inform the CTO whether the goods can be loaded for export by electronically transmitting an authority
to ‘load’ the cargo. In addition, the pilot or owner of aircraft (or their agent) must obtain a ‘Certificate of Clearance’ from the ACS before the aircraft can depart from Australia. A prerequisite is that an electronic Departure Report must be lodged with the ACS. After ensuring that all relevant government requirements are complied with, the ACS will issue a Form 10 ‘Certificate of Clearance’ (Australian Customs Service 2006, pp.51-54).

Export Control Act 1982 (Cwlth): Australia’s rock lobster exports are controlled through the operations of AQIS and the ACS under the Export Control Act 1982 (Cwlth) (the ECA) and its subordinate orders. The ECA includes the Export Control (Fish and Fish Products) Orders 2005 (Cwlth) and the Export Control (Prescribed Goods General) Orders 2005 which provides conditions and restrictions on the export of fish and products (Australian Government, Australian Quarantine Inspection Service 2005, p. 4).

Despite the ECA’s focus on trade facilitation, all AQIS-registered establishments remain subject to the various States or Territory’s other laws on fisheries. This means that fish and processed food must not be prepared from materials that have been received, taken or processed in contravention of any law of the Commonwealth, a State or Territory including State Fishery management arrangements for its abalone fishery (Australian Government, Department of Agriculture, Fisheries and Forestry 2005, p. 6).

Under the ECA, any fish, including rock lobsters, that is to be exported is deemed to be a ‘prescribed good’ and must therefore be processed in an AQIS-registered establishment and accompanied by an export permit. This practice ensures the product’s wholesomeness, that it is truthfully described and that it is consistent with any overseas country requirements. There are severe penalties for breaching this requirement of the Act; the maximum penalty is imprisonment for up to five years, or a fine of $33,000 for an individual and $165,000 for a firm (Australian Government, Department of Agriculture, Fisheries and Forestry 2005, p. 7).
The only exception to this prescription is under Order 15 of the *Export Control (Prescribed Goods – General) Orders 2005* (Cwlth), which deems that certain types and forms of goods are not prescribed. This includes prescribed goods if they are exported in a consignment of no more than:

1. 10 litres – for liquid fish goods; or
2. 2kg – for dried fish (other than dried abalone) or
3. 10kg – for fish and fish products (other than liquid fish and dried abalone) exported in a consignment of no more than 10kgs (Australian Customs Service 2006, p. 85).

Such quantities are deemed to be non-prescribed goods and can therefore be acquired from a non-export registered establishment and exported without an accompanying AQIS export permit. The purpose of this exemption was to minimize regulation and enables the export of ‘trade samples’ by exporters seeking to develop new markets. It also enables ‘non-commercial’ quantities of seafood to be exported from Australia (Australian Government, Department of Agriculture, Fisheries and Forestry 2005, p. 6).

2. **Hong Kong Regulatory Requirements**

In general, there are two levels of Hong Kong government legislation that influence the actors participating in the Victorian and Western Australia to Hong Kong rock lobster air freight markets.

*Import and Export (Registration) Regulations, Chapter 60*: In accordance with the *Import and Export (Registration) Regulations, Chapter 60* of the Laws of Hong Kong SAR, every person who imports or exports any article other than an exempted article is required to lodge with the Commissioner of Customs and Excise an accurate and complete import/export declaration within 14 days after the importation/exportation of the article and pay the required declaration charges (Customs and Excise Department, The Government of the Hong Kong Special Administrative Region 2007, p. 1). The Hong Kong SAR is a free port (Chan 2001, p. 198). There is no tariff on general imports, but excise duties are levied on tobacco, liquor, methyl alcohol, and hydrocarbon oil, whether imported or locally manufactured (Yuen 2004, p. 10). Thus, food products can be imported into Hong Kong duty free (Wolf & Yuen 2004, p. 7).
Exempted articles\textsuperscript{42} (that apply to fish and seafood products), as stipulated in Regulation 3 of \textit{Import and Export (Registration) Regulations} include transshipment cargo, transit cargo, articles imported or exported by the Government or the armed forces, marine fish, including edible crustaceans, molluscs, and other similar edible products arriving in Hong Kong direct from fishing grounds or fishing aircraft registered or licensed in the Hong Kong SAR (Customs and Excise Department, The Government of the Hong Kong Special Administrative Region 2007, pp. 1-3).

\textit{Public Health and Municipal Services Ordinance Cap.132:} Any food, intended for sale in the Hong Kong SAR, whether imported or locally produced, must comply with Hong Kong’s local food laws. The importation of fish and seafood into Hong Kong SAR is governed by Part V (Foods and Drugs) of the \textit{Public Health and Municipal Services Ordinance Cap.132} and its subsidiary legislation, which is enforced by the Food and Environmental Hygiene Department. The basic requirement, as stipulated in Section 54 of the Ordinance, is that no food intended for sale should be unfit for human consumption (Yuen 2006, p. 3).

Countries exporting food products to the Hong Kong SAR are expected to grow, harvest and process food according to the Code of Hygiene Practice recommended by the Codex Alimentarius Commission of the Food and Agriculture Organization of the United Nations, World Health Organization or other high-quality manufacturing or agricultural practice of recognized standards as appropriate. Hong Kong SAR’s Food and Hygiene Department suggests using ‘Hazard Analysis and Critical Control Point’ (HACCP) procedures to produce all products (Fitzgerald 2005, p. 38).

Food importers, through close relations with exporting countries, are responsible for ensuring that marine products they purchase comply with local Hong Kong SAR law. Since marine products, being more liable to bacteriological or chemical contamination in the harvesting zone or handling process, are considered as high-risk food items, the Food and Environmental Hygiene Department strongly recommends to importers to obtain health departments issued by the health authorities of the origin country to accompany their

\textsuperscript{42} The Customs and Excise Department, the Government of the Hong Kong SAR (2007) notes that exempted articles also includes trade samples, goods imported for exhibitions, and goods imported or exported under, and in accordance, with an ATA Carnet.
imports to Hong Kong SAR certifying that the marine products concerned are fit for human consumption. Section 59(1)(c) of the *Public Health and Municipal Services Ordinance Cap.132* authorizes the Food and Environmental Hygiene Department to make special procedures for examining imported food. Currently, when a consignment of marine products arrives at entry points into Hong Kong, it may be subject to inspection or sampling by the Department. If the importer concerned is unable to present a Health Certificate during inspection, the Department will take samples from the consignment for examination before authorizing its release (Centre for Food Safety, The Government of the Hong Kong Special Administrative Region 2006, p. 1; Yuen 2004, p. 10).

*Hong Kong SAR Customs and Excise Department ‘Air Cargo Clearance System (ACCS)’*

The total volume of air freight handled at Hong Kong International Airport has recorded an upward trend over the past decade. In 2009, 3.3 million tonnes of air freight were processed at the airport (Civil Aviation Department Hong Kong 2010, p. 1). To facilitate air freight processing, the Customs and Excise Department of the Government of HKSAR have developed a computer based *Air Cargo Clearance System (ACCS)*. The ACCS system is designed to expedite the clearance of air freight and provides a direct system interface for the exchange of data and customs clearance instructions between Customs and the cargo terminal operators (it is also connected to the Marine Cargo Terminal [MCT]) located at Hong Kong International Airport (Customs and Excise Department of the Government of the Hong Kong SAR 2005, p. 1; Tsang 2000, p. 5).

Under the ACCS system, airlines or cargo terminal operators may submit their air freight data electronically three hours prior to aircraft arrival. Once the data is processed, Customs instructions are transmitted to the cargo operators prior to the flight arrival in Hong Kong. The ACCS system identifies high risk shipments for inspection. After cargo breakdown, the ACCS enables the consignee to take the prompt release on non-constrained cargoes from the airport. Under the ACCS system, more than 50 per cent of inbound air freight consignments destined to Hong Kong are cleared prior to flight arrival. In addition, customs clearance times are significantly faster (Sou 2005, pp. 7-9).
3. International Air Freight Industry Regulatory Regime

Any person involved in handling air freight and complying with appropriate license and legal requirements may apply for registration as an International Air Transport Association (IATA) accredited Cargo Agent (IATA 2007a, p. 1). In Australia there are 199 IATA accredited Cargo Agents and 47 IATA member airlines (IATA 2007c, p. 1). The relationship between Member airlines and their registered cargo agents is administered through a set of IATA Resolutions. These Government-ratified rules establish the rights and obligations of the parties, as well as procedures and requirements for cargo agents (for example, staff qualifications, financial requirements, suitability of premises and handling equipment) who wish to obtain and maintain industry accreditation, thus becoming part of the airlines global distribution system (IATA 2007b, p. 1).
Appendix A1

Growth in World Air Freight Traffic, Freight Tonnage and FTKs, 1989-2009
<table>
<thead>
<tr>
<th>Year</th>
<th>World International Freight Tonnage¹</th>
<th>World International FTKs Performed²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>8.7</td>
<td>45020</td>
</tr>
<tr>
<td>1990</td>
<td>8.6</td>
<td>46320</td>
</tr>
<tr>
<td>1991</td>
<td>8.5</td>
<td>46410</td>
</tr>
<tr>
<td>1992</td>
<td>9.3</td>
<td>50750</td>
</tr>
<tr>
<td>1993</td>
<td>10.3</td>
<td>56050</td>
</tr>
<tr>
<td>1994</td>
<td>11.6</td>
<td>64700</td>
</tr>
<tr>
<td>1995</td>
<td>13.0</td>
<td>70340</td>
</tr>
<tr>
<td>1996</td>
<td>13.6</td>
<td>75510</td>
</tr>
<tr>
<td>1997</td>
<td>15.7</td>
<td>87740</td>
</tr>
<tr>
<td>1998</td>
<td>15.8</td>
<td>87010</td>
</tr>
<tr>
<td>1999</td>
<td>17.3</td>
<td>93280</td>
</tr>
<tr>
<td>2000</td>
<td>18.8</td>
<td>101560</td>
</tr>
<tr>
<td>2001</td>
<td>18.0</td>
<td>95920</td>
</tr>
<tr>
<td>2002</td>
<td>18.8</td>
<td>101590</td>
</tr>
<tr>
<td>2003</td>
<td>19.6</td>
<td>103130</td>
</tr>
<tr>
<td>2004</td>
<td>21.8</td>
<td>115120</td>
</tr>
<tr>
<td>2005</td>
<td>22.6</td>
<td>118440</td>
</tr>
<tr>
<td>2006</td>
<td>23.6</td>
<td>124180</td>
</tr>
<tr>
<td>2007</td>
<td>25.3</td>
<td>132400</td>
</tr>
<tr>
<td>2008</td>
<td>26.0</td>
<td>134100</td>
</tr>
<tr>
<td>2009</td>
<td>22.9</td>
<td>117050</td>
</tr>
</tbody>
</table>


Note:
(1) Freight tonnes (millions).
(2) Freight tonnes kilometre performed (FTKs) millions.
(3) Relates to Figure 1.1.
Appendix A2

<table>
<thead>
<tr>
<th>Year</th>
<th>Inbound Air Freight</th>
<th>Outbound Air Freight</th>
<th>Total Air Freight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>69,804</td>
<td>53,229</td>
<td>123,032</td>
</tr>
<tr>
<td>1981</td>
<td>82,014</td>
<td>60,552</td>
<td>142,566</td>
</tr>
<tr>
<td>1982</td>
<td>89,789</td>
<td>70,652</td>
<td>160,441</td>
</tr>
<tr>
<td>1983</td>
<td>96,324</td>
<td>81,477</td>
<td>177,801</td>
</tr>
<tr>
<td>1984</td>
<td>119,769</td>
<td>90,446</td>
<td>210,214</td>
</tr>
<tr>
<td>1985</td>
<td>118,478</td>
<td>112,523</td>
<td>231,001</td>
</tr>
<tr>
<td>1986</td>
<td>106,914</td>
<td>141,825</td>
<td>248,739</td>
</tr>
<tr>
<td>1987</td>
<td>120,716</td>
<td>167,215</td>
<td>287,931</td>
</tr>
<tr>
<td>1988</td>
<td>145,316</td>
<td>163,567</td>
<td>308,884</td>
</tr>
<tr>
<td>1989</td>
<td>179,556</td>
<td>168,284</td>
<td>347,839</td>
</tr>
<tr>
<td>1990</td>
<td>174,933</td>
<td>182,106</td>
<td>357,039</td>
</tr>
<tr>
<td>1991</td>
<td>171,628</td>
<td>188,074</td>
<td>359,703</td>
</tr>
<tr>
<td>1992</td>
<td>186,343</td>
<td>219,704</td>
<td>406,047</td>
</tr>
<tr>
<td>1993</td>
<td>197,719</td>
<td>257,017</td>
<td>454,736</td>
</tr>
<tr>
<td>1994</td>
<td>240,976</td>
<td>279,622</td>
<td>520,598</td>
</tr>
<tr>
<td>1995</td>
<td>247,681</td>
<td>301,244</td>
<td>548,925</td>
</tr>
<tr>
<td>1996</td>
<td>265,490</td>
<td>317,333</td>
<td>582,823</td>
</tr>
<tr>
<td>1997</td>
<td>302,764</td>
<td>344,082</td>
<td>646,846</td>
</tr>
<tr>
<td>1998</td>
<td>302,643</td>
<td>329,265</td>
<td>631,908</td>
</tr>
<tr>
<td>1999</td>
<td>335,268</td>
<td>346,247</td>
<td>681,515</td>
</tr>
<tr>
<td>2000</td>
<td>332,095</td>
<td>347,915</td>
<td>680,010</td>
</tr>
<tr>
<td>2001</td>
<td>289,661</td>
<td>350,461</td>
<td>640,121</td>
</tr>
<tr>
<td>2002</td>
<td>305,095</td>
<td>340,831</td>
<td>645,926</td>
</tr>
<tr>
<td>2003</td>
<td>313,619</td>
<td>297,592</td>
<td>611,210</td>
</tr>
<tr>
<td>2004</td>
<td>383,423</td>
<td>293,070</td>
<td>676,493</td>
</tr>
<tr>
<td>2005</td>
<td>414,431</td>
<td>294,238</td>
<td>708,668</td>
</tr>
<tr>
<td>2006</td>
<td>440,678</td>
<td>306,050</td>
<td>746,728</td>
</tr>
<tr>
<td>2007</td>
<td>452,813</td>
<td>308,875</td>
<td>761,688</td>
</tr>
</tbody>
</table>


Note:
1. Enplaned tonnes.
2. Relates to Figure 3.4.
Appendix A3

Top Ten Commodities Exported by International Air Freight from Australia, by Value and Weight - 2007
<table>
<thead>
<tr>
<th>Commodity Group</th>
<th>Value</th>
<th>Weight (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold, non-monetary</td>
<td>$11,358,453,738</td>
<td>442.7</td>
</tr>
<tr>
<td>Other commodities &amp; transactions</td>
<td>$6,308,993,259</td>
<td>35,600.8</td>
</tr>
<tr>
<td>Medicinal &amp; pharmaceutical products</td>
<td>$3,227,911,377</td>
<td>11,164.6</td>
</tr>
<tr>
<td>Misc manuf articles nes</td>
<td>$1,505,812,155</td>
<td>16,978.2</td>
</tr>
<tr>
<td>Professional &amp; scientific apparatus nes</td>
<td>$1,224,879,231</td>
<td>5,762.9</td>
</tr>
<tr>
<td>Electrical mach &amp; appl nes</td>
<td>$1,082,618,521</td>
<td>7,677.6</td>
</tr>
<tr>
<td>Office machines &amp; ADP equipt</td>
<td>$1,004,194,396</td>
<td>7,467.3</td>
</tr>
<tr>
<td>Telecommunications &amp; sound recording eq</td>
<td>$641,153,359</td>
<td>3,071.7</td>
</tr>
<tr>
<td>Fish, crustaceans &amp; molluscs</td>
<td>$569,689,329</td>
<td>21,471.6</td>
</tr>
<tr>
<td>Non-metallic mineral manuf nes</td>
<td>$457,837,569</td>
<td>3,000.5</td>
</tr>
</tbody>
</table>


Note:
1. Value in Australian dollars (AUD).
2. Relates to Figure 3.5.
Appendix A4

Top Ten Commodities Exported by International Air Freight from Australia, by Weight and Value - 2007
<table>
<thead>
<tr>
<th>Commodity Group</th>
<th>Value</th>
<th>Weight (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat &amp; meat preps</td>
<td>$356,608,332</td>
<td>49,460.6</td>
</tr>
<tr>
<td>Vegetables &amp; fruit</td>
<td>$135,095,787</td>
<td>44,373.7</td>
</tr>
<tr>
<td>Other commodities &amp; transactions</td>
<td>$6,308,932,259</td>
<td>35,600.8</td>
</tr>
<tr>
<td>Fish, crustaceans &amp; molluscs</td>
<td>$569,689,329</td>
<td>21,471.6</td>
</tr>
<tr>
<td>Misc manuf articles nes</td>
<td>$1,505,812,155</td>
<td>16,978.2</td>
</tr>
<tr>
<td>Medicinal &amp; pharmaceutical products</td>
<td>$3,227,911,377</td>
<td>11,164.6</td>
</tr>
<tr>
<td>Dairy products &amp; birds eggs</td>
<td>$33,353,955</td>
<td>8,638.4</td>
</tr>
<tr>
<td>General industrial mach &amp; equip nes</td>
<td>$455,818,713</td>
<td>8,616.5</td>
</tr>
<tr>
<td>Electrical mach &amp; appl nes</td>
<td>$1,082,618,521</td>
<td>7,677.6</td>
</tr>
<tr>
<td>Office machines &amp; ADP equipt</td>
<td>$1,004,194,396</td>
<td>7,467.3</td>
</tr>
</tbody>
</table>


Note:

1. Value in Australian dollars (AUD).
2. Relates to Figure 3.6.
Appendix A5

Australia’s Major Regional Export Air Freight Markets, by Weight and Value – 2007
### Commodity Group Value Weight (tonnes)

<table>
<thead>
<tr>
<th>Commodity Group</th>
<th>Value</th>
<th>Weight (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>$7,402,783</td>
<td>135,218.0</td>
</tr>
<tr>
<td>Pacific</td>
<td>$3,179,674</td>
<td>61,134.0</td>
</tr>
<tr>
<td>Middle East</td>
<td>$2,499,248</td>
<td>26,683.0</td>
</tr>
<tr>
<td>Europe</td>
<td>$8,745,106</td>
<td>25,393.0</td>
</tr>
<tr>
<td>North America</td>
<td>$3,961,953</td>
<td>18,183.0</td>
</tr>
<tr>
<td>India</td>
<td>$4,508,073</td>
<td>10,647.0</td>
</tr>
<tr>
<td>Africa</td>
<td>$995,841</td>
<td>5,042.0</td>
</tr>
<tr>
<td>Latin/South America</td>
<td>$179,700</td>
<td>1,706.0</td>
</tr>
</tbody>
</table>


Note:

1. Value in Australian dollars (AUD) billion.
2. Relates to Figure 3.7.
Appendix A6

Western Australia’s Fresh, Live or Frozen Western Rock Lobster Exports by Major Markets: 1998-2006.
WESTERN AUSTRALIA’S FRESH, LIVE OR FROZEN WESTERN ROCK LOBSTER
EXPORTS BY MAJOR MARKETS: 1998-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>China ($000's)</th>
<th>France ($000s)</th>
<th>Hong Kong ($000s)</th>
<th>Japan ($000s)</th>
<th>Taiwan ($000s)</th>
<th>USA ($000s)</th>
<th>Others ($000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>22,014,341</td>
<td>1,520,209</td>
<td>38,473,751</td>
<td>43,275,580</td>
<td>34,078,194</td>
<td>9,248,898</td>
<td>1,517,643</td>
</tr>
<tr>
<td>1999</td>
<td>5,220,735</td>
<td>3,657,784</td>
<td>56,815,251</td>
<td>50,153,548</td>
<td>44,525,397</td>
<td>9,654,662</td>
<td>1,959,264</td>
</tr>
<tr>
<td>2000</td>
<td>591,922</td>
<td>1,245,167</td>
<td>64,614,605</td>
<td>58,961,699</td>
<td>49,096,564</td>
<td>6,212,662</td>
<td>1,753,146</td>
</tr>
<tr>
<td>2001</td>
<td>3,294,605</td>
<td>1,669,521</td>
<td>79,394,433</td>
<td>57,302,447</td>
<td>44,917,397</td>
<td>3,427,608</td>
<td>1,486,611</td>
</tr>
<tr>
<td>2002</td>
<td>3,788,203</td>
<td>2,348,978</td>
<td>69,958,329</td>
<td>52,650,763</td>
<td>32,634,631</td>
<td>432,272</td>
<td>973,343</td>
</tr>
<tr>
<td>2003</td>
<td>1,108,788</td>
<td>1,989,427</td>
<td>49,012,862</td>
<td>38,698,255</td>
<td>22,518,236</td>
<td>699,409</td>
<td>1,042,460</td>
</tr>
<tr>
<td>2004</td>
<td>3,002,498</td>
<td>3,573,379</td>
<td>69,567,139</td>
<td>32,857,778</td>
<td>23,674,452</td>
<td>1,763,483</td>
<td>2,284,163</td>
</tr>
<tr>
<td>2006</td>
<td>2,889,090</td>
<td>2,261,359</td>
<td>118,407,434</td>
<td>34,259,289</td>
<td>22,797,865</td>
<td>270,461</td>
<td>2,601,670</td>
</tr>
<tr>
<td>Totals</td>
<td>49,591,881</td>
<td>21,544,076</td>
<td>611,518,859</td>
<td>397,625,345</td>
<td>301,964,012</td>
<td>32,325,895</td>
<td>16,070,613</td>
</tr>
</tbody>
</table>


Note:

1. Value in Australian dollars (AUD).
2. Data relates to Figure 4.1.
Appendix A7

Victoria’s Fresh, Live or Frozen Southern Rock Lobster Exports by Major Export Markets: 1998-2006
### VICTORIA’S FRESH, LIVE OR FROZEN SOUTHERN ROCK LOBSTER EXPORTS BY MAJOR EXPORT MARKETS: 1998-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>China ($000s)</th>
<th>Hong Kong ($000s)</th>
<th>Japan ($000s)</th>
<th>Singapore ($000s)</th>
<th>Taiwan ($000s)</th>
<th>USA ($000s)</th>
<th>Others ($000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>15,538,767</td>
<td>12,520,559</td>
<td>230,425</td>
<td>0</td>
<td>935,861</td>
<td>62,000</td>
<td>193,260</td>
</tr>
<tr>
<td>1999</td>
<td>4,879,190</td>
<td>16,579,344</td>
<td>312,640</td>
<td>5,733</td>
<td>328,874</td>
<td>753,280</td>
<td>307,638</td>
</tr>
<tr>
<td>2000</td>
<td>588,016</td>
<td>21,012,372</td>
<td>148,168</td>
<td>61,301</td>
<td>159,821</td>
<td>823,590</td>
<td>172,969</td>
</tr>
<tr>
<td>2001</td>
<td>512,025</td>
<td>21,518,186</td>
<td>109,837</td>
<td>259,981</td>
<td>6,624</td>
<td>18,900</td>
<td>294,585</td>
</tr>
<tr>
<td>2002</td>
<td>1,666,632</td>
<td>15,276,448</td>
<td>108,060</td>
<td>1,170</td>
<td>13,032</td>
<td>215,999</td>
<td>116,885</td>
</tr>
<tr>
<td>2003</td>
<td>358,436</td>
<td>10,364,356</td>
<td>59,308</td>
<td>189,570</td>
<td>0</td>
<td>156,690</td>
<td>113,707</td>
</tr>
<tr>
<td>2004</td>
<td>1,997,791</td>
<td>19,102,299</td>
<td>107,880</td>
<td>596,654</td>
<td>0</td>
<td>725,871</td>
<td>834,416</td>
</tr>
<tr>
<td>2005</td>
<td>4,298,822</td>
<td>17,499,551</td>
<td>105,088</td>
<td>654,166</td>
<td>0</td>
<td>616,692</td>
<td>1,070,081</td>
</tr>
<tr>
<td>2006</td>
<td>245,102</td>
<td>26,769,445</td>
<td>0</td>
<td>620,418</td>
<td>0</td>
<td>270,461</td>
<td>454,079</td>
</tr>
<tr>
<td>Totals</td>
<td>30,084,781</td>
<td>160,642,560</td>
<td>1,181,406</td>
<td>2,388,993</td>
<td>1,443,672</td>
<td>3,643,483</td>
<td>3,557,620</td>
</tr>
</tbody>
</table>


**Note.**

1. Value in Australian dollars (AUD).
2. Data relates to Figure 5.1.