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THE POLITICAL ECONOMY OF LIBERALISING AIR TRANSPORT IN APEC: REGULATORY ASPECTS AND NEGOTIATING OPTIONS

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ABSTRACT

This study examines the role of regulation and remedial policies for the successful liberalisation of the air transport sector in the Asia Pacific region, and explores negotiating options to maximise the gains from reform. Based on case study analysis, it discusses prominent competition policy and environmental issues arising in the aviation sector and examines initiatives that are being taken to address these concerns. The analysis clearly shows that the once at least partial immunity of air transport from competition law is coming to an end, and that pressure to deal with emissions of greenhouse gas (GHG) from aviation is mounting. There is also growing understanding of these issues and associated best practices are emerging, which could be drawn upon in designing domestic policies. Yet, the unilateral imposition of remedial policies may have wide-reaching consequences for aviation, and a coordinated international response is thus required. The most promising route to reform of the aviation sector appears to be the plurilateral approach. One possible avenue to gradually tackle the most challenging restrictions, in particular ownership rules and cabotage, is the promotion of a liberal policy on wet leasing.

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I. Introduction

The bilateral air transport system established at the Chicago Conference of 1944 has been under pressure for change from several sources for the last decade or so. The Asia Pacific region is predicted to become the largest world air transport market in the near future, in light of its growing economic importance, population and geography. The region therefore seems well placed to take advantage of future reforms to lower trade costs within the framework of bilateral, regional and multilateral initiatives. The empirical analysis carried out in recent studies (Geloso Grosso, 2008; and Geloso Grosso and Shepherd, 2009) provides evidence on the importance of reducing air transport services impediments to enhance international trade in the region, and for APEC economies' integration into international production networks. These findings provide compelling reasons for advancing the reform process of aviation.

Interest in reform is also growing among airlines, since the system imposes constraints on their operations and ability to reduce costs, and may be one of the factors explaining the limited profits registered by the industry. Under the current system, airlines have to construct their networks through a myriad of bilateral agreements and some pairs of cities, although potentially served in an efficient network, may not be serviced in light of market access restrictions in these agreements (Findlay and Round, 2006). The tourism sector, which stands to gain from improvements in air transport efficiency and lower fares, and in general increasing consumer influence, represents an additional important factor. In the Asia Pacific region, in particular, rising middle class population and a more aware consumer environment means that governments in the region have to pay more attention to their interests when formulating aviation policy decisions (Zainal-Abidin et *al*., 2005).

Nevertheless, liberalisation of the air transport industry is a difficult process that raises several challenges. For starters, standard political economy factors, such as adjustment costs and resistance by incumbents to erosion of rents, have to be taken into account. There are also concerns stemming from several sources of market failure, which call for the establishment of strong regulatory frameworks. Market opening in the air transport sector raises competition policy concerns. The benefits from liberalisation may be diminished or not realised if carriers are permitted to collude or to generate excessive market power. As the system established by the Chicago Conference, which has typically substituted for competition rules in aviation, is progressively reformed, bringing the sector under the scope of competition law is becoming increasingly important. The key challenges arise from the fact that competition law is

relatively new or not yet in place in several low-income APEC economies, and from the often transnational nature of potential anti-competitive behaviour.

New entry and growing competition additionally require enhanced efforts to ensure public policy objectives, such as environmental protection. A standard negative externality of air transport relates to emissions of greenhouse gas (GHG) into the atmosphere. Air transport is estimated to contribute only around 2% of total GHG emissions, although in light of the sector's forecasted growth, CO_2 emissions from global air transport are projected to increase significantly in the next few decades. There has thus been growing discussion on how to establish policies to reduce aviation's GHG emissions. The task is particularly difficult since emissions from international air transport do not fall under the authority of any single country. Although the potential for environmental mitigation through technological and operational measures is significant, the projected growth rates of the sector mean that such efforts need to be complemented by effective regulations in order to cope with the related expansion in emissions.

Another important consideration is the negotiating process. Exchanging enhanced traffic rights and easing other restrictions in bilateral agreements is a relatively simple endeavour, while agreeing to extend concessions to a broader set of countries can be quite complex. Most commentators are of the view that, in light of the way the industry is currently structured and the interests of most governments in national airlines, a multilateral framework for aviation applying the MFN principle may not be a realistic goal in the short term. Nevertheless, there are alternative paths that could lead to a more gradual integration of aviation into the GATS, providing for incremental changes to its current characteristics. APEC could provide a framework in which such progressive steps can be tested, creating the momentum for aviation to be included in the WTO.

This paper employs case-study analysis to examine the importance of regulation needed to accompany successful air transport liberalisation, and to explore negotiating options available to APEC members to maximise the gains from reform. Section II discusses prominent competition policy issues potentially arising in the sector and examines initiatives that are being taken to address these concerns, particularly in the Asia Pacific context. Section III addresses the question of GHG emissions from aviation, reviewing existing attempts to make progress in this area at national and international levels. Section IV evaluates the advantages and shortcomings of the variety of negotiating proposals that have been put forth by experts to advance the reform process, and suggests a possible avenue to gradually tackle the most prominent impediments to broader liberalisation in the sector. Section V summarises the emerging issues for aviation liberalisation in APEC economies and the last section concludes.

II. The role of competition policy and institutions

Competition policy represents a prominent source of concerns that might arise as a consequence of reforms in air transport. The benefits of aviation liberalisation in APEC may not be realised if airlines are allowed to generate unwarranted market power through mergers or strategic alliances, to collude or to engage in predatory practices. The regulatory system established at the Chicago Conference has traditionally supplanted competition rules in air transport and the sector has until recently remained outside the scope of competition law. Instead, air passengers and cargo services developed under a system of close cooperation among carriers. As a result of domestic and international liberalisation, the aviation regulatory framework is in the midst of structural transformation and the question of how to maintain and promote competition in the sector is becoming increasingly important.

Competition policy at the multilateral level and in APEC

The application of competition law and policy to aviation at the international level raises significant challenges, since international routes do not fall under the jurisdiction of a single national competition law and authority. These difficulties are exacerbated by the existing asymmetry of competition law and policies across countries. Advanced APEC economies and Latin American member countries generally have well developed competition laws and institutions. At the same time, as shown in Table 1, in the ASEAN region competition law is relatively new and several countries have yet to put it in place. Only Indonesia, Singapore, Thailand and Vietnam have a comprehensive framework covering the pillars of competition law (collusion, anticompetitive agreements and abuse of market dominance), while other ASEAN economies rely on the penal or civil codes to address uncompetitive behaviour or competition policies are included in fragmented sectoral regulations. However, efforts are being made in some of these countries, such as Malaysia, to introduce competition law.

Table 1. Competition laws and authorities in developing and emerging APEC economies

	Competition Law	Date	Types of provisions	Authority
Brunei	N.a.			
Chile	Chilean Competition Law	1973	Abuse of dominance, collusive behaviour and predatory practices	Antimonopoly Commission and National Economic Prosecution Bureau
China*	Anti-monopoly Law	2008	Anticompetitive monopoly and collusive agreements, abuse of market dominance and restrictions on mergers	National Antimonopoly Commission
Hong Kong	N.a.			
Indonesia	Law on Prohibition of Monopoly Conduct and Unfair Competition Practices	1999	Anticompetitive agreements and conduct, unfair business practices and abuse of market dominance	Commission for the Supervision of Business Competition
Republic of Korea	Monopoly Regulation and Fair Trade Act	1980	Monopolies, oligopolies, mergers, cartels, unfair trade practices and the conduct of trade associations	Korea Fair Trade Commission
Malaysia	N.a.			
Mexico	Federal Law on Economic Competition	1993	Arrangements unduly restricting trade, such as alliances and joint fares, predatory pricing, cross-subsidisation and price discrimination	Federal Competition Commission
Papua New Guinea	Independent Consumer and Competition Commission Act	2002	Targeted exclusionary conduct, price fixing, abuse of market power and acquisitions	Independent Consumer and Competition Commission
Peru**	Peruvian Antitrust Law	2008	Restrictive trade agreements and abuse of market dominance	Indecopi
Philippines	N.a.			
Singapore	Singapore Competition Act	2006	Anticompetitive agreements, abuse of dominance and mergers and acquisitions	Competition Commission of Singapore
Chinese Taipei	Fair Trade Law	1991	Monopolies, mergers, concerted actions and vertical restraints	Fair Trade Commission
Thailand	Trade Competition Act	1999	Monopolies, mergers, collusive actions and unfair practices	Thai Trade Competition Commission
Vietnam	Vietnam Competition Law	2005	Agreements restricting competition, abuse of dominant or monopoly position, concentration of economic power restricting competition and unfair competition	Vietnam Competition Administration Department and Vietnam competition Council

Note: * A previous Law of Anti-Unfair Competition was established in 1993; **Initial competition law was enacted in 1991 (Legislative Decree 701).

Due to the extraterritorial nature of potential anti-competitive behaviour and unilateral enforcement of domestic competition rules, discussions have been ongoing on how to strengthen international cooperation in order to avoid conflicts and to promote a more efficient air transport industry. To date, however, only limited headway has been achieved. At the multilateral level, ICAO has developed non-binding recommendations and guidelines in several areas relevant to competition policy in aviation. A prominent example is the 1989 ICAO Model Clause for Competition Safeguard in Air Service Agreements, which provides a safeguard clause to address anticompetitive practices that can be included into air service agreements. Although useful to introduce several general principles, ICAO's guidelines and codes of conduct may not be sufficient to keep pace with current developments of competition policy concerns in international aviation.

In the APEC context, cooperation on competition policy is only at an initial stage and will require further development. In 1999, APEC developed the "Principles to Enhance Competition and Regulatory Reform", which call for the establishment of a comprehensive and non-discriminatory competition policy framework and of effective means for cooperation between competition agencies in different countries. The Principles are of a non-binding nature and are to be implemented on a voluntary basis. Some encouraging signs pointing towards recognition of the importance to address the rising challenges posed by competition policy are provided by ASEAN members, notwithstanding their limited and recent experience with legislation and institutions in this area. Under the 1997 ASEAN Economic Blueprint, ASEAN Leaders agreed to establish some form of competition policy by 2015.

Competition policy issues in aviation

Airline alliances and collusive behaviour

Liberalisation trends in the air transport industry have strengthened competition with new players entering the market and, more recently, have led to the fast development of low cost carriers (LCCs). Particularly in the time-insensitive passenger segments, these carriers provide a major challenge to the traditional full service operators. Partly in light of this growing pressure, traditional carriers have exploited different forms of cooperation and consolidation in an effort to expand network coverage and increase efficiency. Since ownership restrictions in the bilateral regulatory framework of air transport do not permit cross-country mergers, strategic alliances have become the primary means for strengthening global networks and have facilitated the development of hub-and-spoke systems.

Passengers travelling in international routes are increasingly carried by airlines members of one of the three major airline alliances (see Table 2). Together the Star Alliance, Oneworld and SkyTeam account for almost 80% of the global air transport market based on revenue passenger-kilometre, and carriers from APEC economies are increasingly being part of these agreements. Strategic alliances can take different forms. A prominent feature of alliances is code-sharing, which allows one airline's designator code to be shown in flights operated by its partner airlines. But alliances may go beyond code-sharing and cover route and schedule coordination, advertising and distribution networks or even coordinated pricing or revenue sharing mechanisms.

Table 2. APEC carriers in global passenger airline alliances (2008-2010)

	Star Alliance	Oneworld	SkyTeam
Year of formation	1997	1999	2000
Global market share	30.8%	21.5%	25.7%
Destinations	912	727	856
Annual passengers	603 million	328 million	384 million
Number of members	26	12	9
Member airlines	Adria Airways	British Airways	Air France
	Austrian	Finnair	Alitalia
	Blue 1	Iberia	CSA Czech Airlines
	Bmi	Malév	KLM Royal Dutch Airlines
	Brussels Airlines	Royal Jordanian	
	Croatia Airlines		
	EGYPTAIR		
	LOT Polish Airlines		
	Lufthansa		
	Scandinavian Airlines		
	South African Airways		
	Spanair		
	SWISS		
	TAP Portugal		
	Turkish Airlines		
APEC airlines	Air Canada	American Airlines	Aeroflot
	Air China	Cathay Pacific	Aeromexico
	Air New Zealand	Japan Airlines (JAL)	China Southern Airlines
	ANA	LAN	Delta Air Lines
	Asiana Airlines	Mexicana	Korean Air
	Continental Airlines	Qantas	
	Shanghai Airlines	S7 Airlines	
	Singapore Airlines		
	THAI		
	United		
	US Airways		

Note: Market shares are based on revenue passenger-kilometre. Oneworld has 19 affiliate members, 13 of which are from APEC economies.

There is growing literature highlighting both benefits and costs deriving from these agreements and that their net effects are not clear (see Box 1). Alliances allow partner airlines to reduce costs by integrating activities and by linking existing networks. Hub-and-spoke networks provide them with benefits arising from economies of scale, reducing costs related for example to sales and marketing or customer service facilities. In addition, efficiency gains can be made through enhanced flexibility in switching assets to other routes adjusting supply to expected fluctuations in demand. If these efficiencies are transferred to passengers, alliances can reduce fares and provide additional benefits, such as ease of connections and greater frequency (Findlay, 2005).

Box 1. Empirical evidence on the effects of airline alliances

Oum *et al.* (2000) analysed the impact of major alliances on prices and other measures of economic performance. The study finds that in most cases alliances increased passenger volumes and, through cost reductions, decreased fares on served routes. Even though mark-ups increased for some alliances, these effects were outweighed by decreases in marginal costs. In some instances, alliances contributed to more competitive markets by strengthening the position of weaker carriers.

Iatrou and Alamdari (2005) find that alliances bring about considerable benefits for airlines. The analysis shows that alliances significantly increase passenger traffic and load factors (especially on hub-to-hub routes), which in turn have a positive impact on airlines' revenues. The effects on fares are more uncertain, with some alliances leading to no change while others to actual price increases.

Wan *et al.* (2009) investigate the effects of airline alliances on non-stop hub-to-hub routes and find that the net impact on airfares is unclear. Using data from the three major alliances (Star Alliance, Oneworld and SkyTeam), the study shows that there are offsetting effects of alliances on passengers travelling on these routes. On the one hand, joint price setting may lead to fare increases on routes covered by a single airline. On the other hand, efficiency gains can counterbalance these effects and contribute to lower prices on these routes.

At the same time, alliances can increase the market power of partner airlines, lead to anti-competitive behaviour and ultimately increase fares. The effects of alliances thus depend greatly on the specific circumstances and prevailing market conditions. A prominent consideration by authorities relates to the maintenance of competition from existing hub carriers. Attention is paid also to time-sensitive passengers segments (e.g. business travellers), where competition is less intense and fares remain very high. But even where intervention is deemed appropriate, competition authorities typically refrain from prohibiting alliances and consider remedies to redress the possible anti-competitive impact of these arrangements. In a recent case involving a proposed trans-Atlantic alliance between American Airlines

and British Airways, approval for the agreement was granted but the airlines were required to give up at least four takeoff and landing slots in the UK and the US (Global Travel Industry News, 2010).

Even when they are not in the context of a strategic alliance, airlines may thwart competition by acting essentially in the form of a cartel. They may agree to fix prices or to market sharing, whereby they serve different markets instead of competing between themselves. Cartels can impose significant costs on affected countries and especially on developing economies, which may lack appropriate safeguards. The airline industry has in recent years been subject to a major investigation into both cargo and passenger price-fixing in relation to the implementation of a fuel surcharge system. A number of airlines from APEC economies have been involved in the prosecution, which is one of the largest that ever took place, leading to substantial fines and jail time for airlines' executives in a range of countries (see case study below).

Predatory practices

Predatory pricing and related practices (e.g. targeted capacity expansions) represent another source of potential competition policy concern in the air transport sector. These practices can be used to drive competitors out of the market or to prevent entry, particularly by low-cost carriers with more limited financial capacity. Until the early 1980s, economic analysis suggested that predatory pricing was not a rational profit-maximising strategy, and that antitrust authorities should treat allegations of predatory conduct with scepticism. More recently, theoretical contributions incorporating advances in game theory and asymmetric information indicate that predatory practices can be a rational business strategy under certain conditions. Commentators have also strived to help competition authorities distinguishing between aggressive pricing and predatory conduct, a task which is notoriously difficult (see Box 2).

Box 2. The economics of predatory practices

McGee (1958) and a number of other earlier analyses of predatory practices argued that they represent in most cases an unprofitable business strategy, since the initial losses incurred by the incumbent from engaging in such practices may not be recouped as subsequent re-entry by competitors cannot be deterred. The development of game theory and the literature on imperfect information in the 1960s and 1970s contributed to show that predation may be rational under specific assumptions. As recently summarised by Brock (2005), such assumptions include financial market predation (a more refined version of the previous "long pursue" theory) and reputation effects.

Financial market predation, initially developed by Fudenberg and Tirole (1986), suggests that even in developed financial makers where in principle smaller firms could borrow to sustain a price war, investors would not be willing to finance them. This results from asymmetric information between managers of the firms and investors, and the

consequent inability of the latter to distinguish instances where poor performance is only resulting from predatory behaviour. As described by Kreps and Wilson (1982), reputational models are based on imperfect information on the characteristics of the established firm. As such, vigorous price wars against the first entrant can discourage other potential entrants.

In efforts to help identifying predatory practices, Areeda and Turner (1975) point out that predation only arises when prices are held below marginal costs. Recognising that measuring marginal costs may be very difficult in practice, they design a test of predatory pricing based on the comparison of prices and average variable costs. Baumol (1979) introduces a temporal element to the price-cost test, whereby the established firm would be permitted to cut prices but not to re-raise them when the entrant exits the market. Joskwow and Klevorick (1979) suggest the additional incorporation of an assessment of the market structure. Only in instances where there is sufficient market power may predatory pricing be a rational strategy.

Focusing specifically on the air transport industry, Oster and Strong (2001) note that airlines have at their disposal several instruments to compete, making potential predatory behaviour more difficult to detect. These instruments include multiple fares as part of revenue management, flight frequency and capacity, and frequent flier programmes, as well as in flight and ground amenities. Network effects also need to be considered since airlines could potentially engage in predation by making use of their networks without changing their prices in a given city-pair market (e.g. by increasing frequency or lowering fares in other parts of the network). As such, evaluating predation only on the basis of narrowly-defined prices and costs may not be adequate.

In the airline industry there have been numerous allegations of predation following liberalisation in advanced APEC economies such as the US, Canada and Australia. These claims have contributed to the development of increasingly sophisticated rules in these countries, building on theoretical contributions in an attempt to identify instances of predatory behaviour. US jurisprudence requires an assessment of such behaviour following a three-stage approach similar to the one suggested by Joskwow and Klevorick (1979). Three criteria must be satisfied to prove predation: it must occur in a concentrated market in which the accused firm has monopoly power; pricing must be below average variable costs (the Areeda-Turner criterion formally adopted in 1975); and evidence is found that the alleged violator is able to recoup the losses incurred during the period of predation. In Canada and Australia, enforcement guidelines have indicated that competition agencies follow a similar three-tier process.

Although proven cases of predation remain rare, Table 3 shows that in the 2005 antitrust action opposing Northwest Airlines to low-cost entrant Spirit Airlines, the US Court of Appeal for the Sixth Circuit overturned summary judgment by the lower court and determined that a jury could reasonably find that Northwest Airlines engaged in predatory pricing. The investigation subsequently stalled since Northwest Airlines filed for bankruptcy and then merged with Delta. In 2000, the Canadian Competition Bureau required Air Canada to temporarily cease offering certain fares on routes in eastern Canada,

following allegations of predation made by low-cost carriers CanJet and WestJet. The Tribunal confirmed the temporary order, but the case was then abandoned by the Bureau as a result of changed circumstances in the market, including with respect to the expansion of low-cost carriers. Nevertheless, both decisions have established principles which will be relevant in potential future cases of predatory behaviour.[1]

Table 3. APEC economies' predation cases in the airline industry

Authority	Airlines	Period	Result
US Department of Justice	American Airlines V. Vanguard, Western Pacific and SunJet	1999-2003	US Court of Appeals: failure to establish that American Airlines priced below an appropriate measure of cost
	Northwest Airlines V. Spirit Airlines	2000-2005	US Court of Appeals: a jury could reasonably find that Northwest Airlines engaged in predation
Canada Competition Bureau	Air Canada V. CanJet and WestJet	2000-2003	First phase: Tribunal found that Air Canada set prices below avoidable cost; second phase discontinued as a result of changed market conditions
Australian Competition and Consumer Policy Commission	Quantas V. Virgin Blue	2000-2003	Case discontinued as ACCC could not establish evidence of predation by Quantas

Airport slot access

Market opening in aviation and the emergence of LCCs have made air transport more affordable, leading to a surge in demand which is placing constraints on the infrastructure of airports globally. The Asia Pacific region is predicted to grow by 222 million passengers between 2006 and 2010, and to become the largest world air transport market with a 37% share of traffic (IATA, 2007). The region also accounts for almost 40% of world cargo traffic, and is expected to continue to lead the world air cargo industry in annual average growth rates in the next 15 years (Boeing, 2007). The rapid traffic growth has led to tightening of aviation infrastructure, with some airports in the region already operating above capacity (e.g. Tokyo Narita and Jakarta). Although considerable expansion in airport capacity has been generated in Asia, including in China, Singapore and Thailand, the projected exponential growth of international air traffic may lead to infrastructure deficiencies even in these airports.

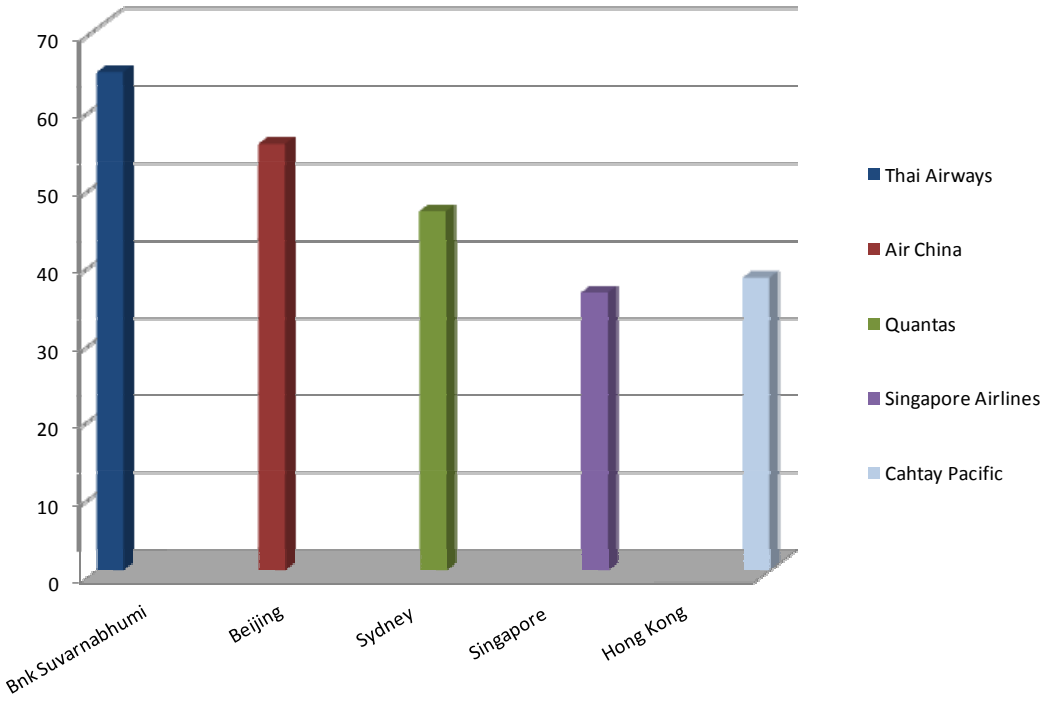
[1] In addition, Germany's competition authority in 2002 issued a price injunction against Lufthansa, finding that the airline engaged in predatory pricing against its low-cost competitor Germania.

Airport take-off and landing slots (entitlements to use a runway at a given time) represent the primary infrastructure access for aviation and they are in excess demand in congested airports, especially at peak hours.[2] The existing arrangement of slot allocation dates from the early 1960s and entails an administrative process based on guidelines laid down by IATA and bi-annual meetings by coordinators and airline representatives in international slot allocation conferences. The system is based on several principles. Most notably, the already allocated slots are the "grandfather" assets of incumbent airlines, allowing them to retain the slots from one season to the next (though airlines lose grandfather rights if they do not achieve at least 80% usage). Hence, incumbent airlines typically enjoy first comer advantage, allowing them to retain most of the slots in the home market and to fly passengers during peak hours, hindering potential new entrants in the market (Barbot, 2004).

To compensate new entrants for disadvantages resulting from the regime, a rule was added to the IATA guidelines in the early 1990s providing that 50% of slots remaining from the historical allocations are granted to them. However, full competition is not ensured since new entrants can only claim the remaining slots, which are typically at off peak hours. As shown in Figure 1 below, the capacity share of incumbent carriers in APEC's hub airports remains very high, at times over 50%. Furthermore, although the system allows the exchange of slots on a one-to-one basis, monetary trading is not intended and is generally not permitted in countries around the world. Most of the busiest airports in APEC have thus instituted local scheduling and coordinating committees or state administrators (e.g. Japan and Australia), which broadly follow the IATA guidelines.

[2] Slot scarcity is less of a concern for all-cargo flights, given that typically their taking-off and landing times do not coincide with those of passenger flights. All-cargo carriers and integrated express operators are more affected by restrictions on time/schedules for airport use, including total curfews.

Figure 1. Capacity share in home country hubs, 2009-2010



Source: Centre for Asia pacific Aviation and Air China's website.

The US experience with slot allocation features some important differences. For antitrust reasons, the IATA based system does not apply and airlines are generally allowed to schedule their flights simply taking into account expected delays at the busier airports. However, to efficiently meet demand growth following deregulation in 1978, the US Department of Transportation restricted the number of slots at the four major airports (Kennedy and La Guardia in New York, O'Hare in Chicago and Washington International), and allowed airlines to buy and sell slots at these airports. Only some restrictions apply on slot trading, in particular large carriers are not allowed to buy commuter slots. In addition, there is a use-it-or-lose-it rule (slots have to be used 80% of the time) and free or new slots are allocated using a lottery after 25% of them have been offered to new entrants.

The system has been criticised for increasing concentration at the major US airports and for leading to higher passenger fares. It has also fuelled debate on the role of market-based mechanisms in the allocation of slots and how they may be integrated in the existing IATA framework (see Box 3). However, evidence points to an increase in overall efficiency in the US market due to slot trading. The increase of slot holdings by incumbent airlines was found to be related to higher use of slots by the same airlines, and

hence not done in an effort to deter new entrants. Flag carriers may well be willing to pay the cost of new slots in hub airports in light of potentially significant network benefits. Furthermore, higher fares at congested airports are not necessarily the result of market power but can simply reflect passengers' willingness to pay more for (scarce) airport capacity they value most (Starkie, 1994; and Starkie, 2007).

Box 3. Reforming airport slot allocation

Slot allocation mechanisms have been extensively examined in the literature (Starkie, 1998; Sentence, 2003; and Zhang and Zhang, 2006). Under the current IATA guidelines, the demand for slots is set according to administrative rules, regardless of which airline values them more. With the increasing imbalance between demand and capacity in hub airports around the world, alternative market-based instruments have been considered. Such instruments can provide for more efficient use of scarce airport capacity, by allocating slots according to the economic value airlines derive from them, effectively redistributing them to services which are most beneficial to passengers.

Governments have at their disposal a range of mechanisms to reform the current slot system in relation to both the initial allocation process (primary allocation) and the trading of slots by airlines (secondary trading). The most radical change would entail elimination of grandfather rights and the establishment of an auction scheme for slots instead. Yet, several commentators are of the view that there are practical (e.g. the mechanics of complex auction schemes) and institutional difficulties (a disruption resulting from undermining the current system) making auctioning not a realistic option in the short term.

An alternative option would be charging airlines the full cost of using the slots, including a congestion pricing component under which landing fees reflect the carrier's contribution to congestion at airports. This reform process could be more easily implemented since airport authorities would fix the price, instead of being reached by airlines through the auctioning system. Nevertheless, congestion pricing has not been recommended in airports where carriers have significant market power, since they may be inclined to internalise the costs of congestion by increasing passenger fares.

A more gradual approach towards market-based mechanisms would be allowing secondary trading. This system, while ensuring the benefits of slot trading, is compatible with other allocation regimes, including the current IATA guidelines (it would just entail a change from barter trade to commercial exchange of slots). At the same time, the US experience shows that secondary trading enables airlines to enhance their dominant position at airports. Although this outcome can occur on efficiency grounds, airlines may strategically sell or lease slots to restrain competition. The UK Civil Aviation Organisation (2006) has suggested remedies to address such potential anticompetitive behaviour, e.g. through use-it-or-lose-it rules or by preventing the introduction of conditions on how purchased slots can be used in the future.

Case study: International air cargo and passenger price fixing cartel

A major investigation into air cargo and passenger transport price-fixing over the last decade has produced substantial fines for airlines and jail time for their senior executives around the world. The conspiracy alleged by various competition policy authorities involved fees such as fuel surcharges imposed by airlines operating in international routes, including several carriers from APEC economies. This is one of the largest and most far-reaching conspiracies ever prosecuted, illustrating that globalisation and liberalisation have brought aviation fully within the realm of competition law and policies. The case further shows the potentially biased results that even an investigation successfully coordinated at the international level can have on poorer countries, which cannot protect their citizens from unlawful behaviour in the absence of well developed competition law and enforcement authorities.

Background

Air transport is among the industries most affected by rising oil prices. Fuel accounts for an increasingly larger share of operating costs of airlines, currently representing around 30% overall, a share considered to be even higher for air freight transport. Since 2000, faced with decreasing profit margins, airlines responded to increasing fuel prices by implementing a fuel surcharge system on air passenger and especially freight costs. These include a number of air carriers from Asia Pacific economies. The phenomenon spread over to the entire transport chain, including maritime freight shippers, railroad and trucking companies, as well as to freight forwarders and integrated express operators. In addition to fuel surcharges, security, war risk (particularly after the September 11 terrorist attacks) and customs surcharges also became widespread.

The surcharge attracted since the beginning considerable criticism on the grounds that it bears limited if any relationship to the actual impact of fuel costs. In particular, the surcharge is calculated solely on the basis of the cargo's weight, regardless of the distance actually travelled. Early attempts by IATA to create an industry-wide fuel surcharge system were also rejected by US regulators for its potential negative impact on shippers. Despite these warnings, more and more airlines introduced similar surcharges and frequently simultaneous rate increases, often based on a fuel spot-price index developed by Lufthansa,

leading to mounting prices for international shippers.[3] For instance, between May 2004 and October 2005, the level of surcharges rose from USD 0.20 per kilogramme to USD 0.60 per kilogramme (Appel, 2008).

Government regulatory prosecutions and private enforcement class actions

In early 2006, antitrust officials raided the offices of airlines in countries around the world to investigate whether the surcharge system violated competition rules. Investigations were commenced simultaneously by US and European authorities, but expanded to a number of other competition policy agencies throughout the world. These include several authorities from APEC countries, in particular the Australian Competition and Consumer Commission (ACCC), the Competition Bureau of Canada, the Fair Trade Commission of Korea and the New Zealand Commerce Commission. The prosecutions led to charges on airlines from several countries for conspiring to fix international rates for international cargo shipments as well as prices of passenger flights. Most notably, the collusion is believed to have resulted in overcharging businesses using air freight services between 2000 and 2006.

The criminal investigations had a very significant impact on the air transport industry in the Asia Pacific region and beyond. As indicated in Table 4, the competition authorities of more developed APEC economies obtained guilty pleas with high fines for several major airlines.[4] The US Department of Justice alone recovered fines totalling over USD 1.5 billion, which represents one of the highest amounts of total fines ever imposed in an antitrust investigation. The Department of Justice also obtained guilty pleas from four senior executives of the airlines (including Quantas as well as British Airways, Martinair and SAS Cargo), with sentences ranging from six to eight months in prison and USD 20,000 in fines (except for the SAS executive who received only a jail sentence).

[3] Most airlines use indices of spot prices for fuel to set the level of the fuel surcharge over time, following the index originally developed by Lufthansa. The company's fuel index methodology can be found on its website. The index is based on the average price of aviation fuel in the world's five key spot markets for crude oil and kerosene (Rotterdam, Mediterranean, Far East Singapore, US-Gulf and US-Westcoast). The formula calls for a review of fuel prices every two weeks and adjusts surcharges accordingly.

[4] Lufthansa and Virgin Atlantic applied to the US Department of Justice and other competition authorities for immunity from fines and prosecution to price-fixing in air cargo and passengers. Regulators generally have policies of according leniency to corporations that report their illegal behaviour at an early stage. Both companies were granted immunity for their cooperation.

Table 4. Carriers fined by APEC authorities

Authority	Airline	Date	Sector	Fine
US Department of Justice				
	British Airways	1 August 2007	Cargo and passenger	300
	Air France — KLM	27 June 2008	Cargo	350
	SAS Cargo	28 June 2008	Cargo	52
	Martinair	29 June 2008	Cargo	42
	Cargolux	9 April 2009	Cargo	119
	Aerolinhas Brasileiras	22 January 2009	Cargo	21
	EL AL Israel Airlines	22 January 2009	Cargo	15.7
	APEC airlines			
	Korean Airlines	1 August 2007	Cargo and passenger	300
	Quantas	27 November 2007	Cargo	61
	Japan Airlines	16 April 2008	Cargo	110
	Cathay Pacific	27 June 2008	Cargo	60
	LAN Cargo	22 January 2009	Cargo	88
	Asiana Airlines	9 April 2009	Cargo and passenger	50
	Nippon Cargo Airlines	9 April 2009	Cargo	45
Australian Competition and Consumer Policy Commission				
	British Airways	11 December 2008	Cargo	5
	Air France — KLM	16 February 2009	Cargo	6
	Martinair	16 February 2009	Cargo	5
	Cargolux	16 February 2009	Cargo	5
	APEC airlines			
	Quantas	11 December 2008	Cargo	20
Canada Competition Bureau				
	Air France — KLM	26 June 2009	Cargo	9
	Martinair	26 June 2009	Cargo	1
	APEC airlines			
	Quantas	7 July 2009	Cargo	135

Note: The fines are in USD million.

More recently, the names of airlines from low-income developing countries started to appear among those under investigation for the fuel and other surcharges. The New Zealand Commerce Commission, one of the latest competition authorities to start prosecutions in the case, has since the end of 2008 initiated proceedings in the High Court of Auckland against 13 airlines and several airline staff for cartel activity in the air cargo market. The list includes 10 airlines from APEC economies, several of which are from developing countries in Asia:

- Air New Zealand

- Cathay Pacific
- Garuda
- Japan Airlines
- Korean Airlines
- Malaysian Airlines
- Quantas
- Singapore Airlines
- Thai Airways
- United Airlines

The criminal prosecutions were followed by a series of civil legal proceedings commenced in the US and Canada in early 2006, and more recently in Australia. Most Asia Pacific carriers were named in the civil lawsuits, including Air China, Asiana Airlines, Cathay Pacific, Singapore Airlines, Air New Zealand and Thai Airways. The plaintiffs alleged cartel arrangements between the airlines to increase the level of fuel and other surcharges, carried out through meetings and conversations by high-ranking officials of the airlines to manipulate air freight rates. To date, Lufthansa agreed to pay USD 85 million in settlement of the proceedings in the US and USD 5.4 million in Canada. The actual and potential scope of the private suits is remarkably wide since any business that purchases air cargo services can be affected by the surcharges. As shown in the US class actions, the list of plaintiffs goes beyond shippers and includes major retailers such as IKEA and H&M (US Court Eastern District of New York, 2007).

The investigations revealed that a number of freight forwarders and express operators may also be involved in potential antitrust violations based on the surcharge system. In October 2010, US and several other competition authorities launched another wave of raids in the offices of major freight forwarders and issued subpoenas to provide additional information relating to their dealings with airlines involved in the global price-fixing cartel. A civil lawsuit was further commenced in the US Court Eastern District of New York alleging freight forwarders to use surcharges for fixing the prices of their services through agreements reached at trade associations meetings. The ongoing criminal prosecutions and civil legal proceedings concern several freight forwarders and express operators from APEC economies, including FedEx, UPS and Expeditors International (Dolotosky, 2008).

Coordinating efforts and strengthening competition policy regimes

Notwithstanding its high profile, the case has so far been the subject of relatively limited analysis. Several commentators have praised the investigation as a prominent example of international coordination by competition authorities, as well as of success in punishing the anticompetitive behaviour of airlines and collecting record fines (Libow and D'Allaird, 2009; Hartwell III and Petkoski, 2009; and Thai, 2008). In particular, the near simultaneous raids by US and European authorities in several jurisdictions, which ultimately led to the high criminal fines paid by the airlines, are an illustration of the fact that cooperation and information exchange between competition policy agencies of different countries is possible even in the absence of a formal cooperation agreement between them.

Appel (2008) is one of the few thorough examinations of the price-fixing conspiracy. The analysis focuses on the implications of the criminal and civil litigations for consumers, the primary intended beneficiaries of competition law, indicating that the prosecutions did not lead to lower prices. This is the result of an exclusive focus of competition authorities on express agreement between airlines to fix or raise prices, in an industry which features oligopolistic market structures and is thus prone to parallel conduct even in the absence of explicit communication among competitors. Such conduct can be facilitated by the use of a spot price index, like the one developed by Lufthansa, to rapidly signal price adjustments to others. Hence, the current approach has merely succeeded in punishing a few apparent conspirators without protecting consumers from the existing pattern of collusive behaviour in the industry.

Less attention has been paid in the literature to the impact of the cartel on developing countries (Mehta, 2007). It remains to be seen how many countries will conduct their own investigations (as opposed to just cooperating with the US and European authorities), but to date only the most advanced countries have done so. This is evident in the context of APEC, where only the US, Australia, Canada and New Zealand have actively commenced prosecutions surrounding the case. The presence of airlines from poorer countries, such as Garuda and Thai Airways, in the list of carriers under criminal and civil investigation, suggests that the conspiracy may have directly affected firms and citizens of these countries as well. As the competition policy regimes in these and other low-income economies in the Asia Pacific region are either weak or not yet in place, there are limited prospects for local investigations to compensate their residents for the ensuing damages.

As seen earlier, the alleged conspiracy is believed to have affected different market participants in light of the important role that air cargo plays in international trade. So these damages are likely to be significant. Furthermore, anticompetitive air cargo prices have a negative impact on all consumers through higher retail prices on the products affected. It is clear from the case that the once at least partial immunity of air transport from competition law is coming to an end, and that in the context of globalisation and liberalisation competition law and policies are becoming increasingly important for the sector. Yet, enhanced efforts are needed by more countries in APEC to establish competition regimes, and to promote through pedagogical and capacity building activities a competition culture in poorer countries.

III. Aviation and climate change

A standard negative externality of air transport relates to emissions of GHG into the atmosphere, generated by fuel consumption during flight. Scientific work recently released by academics and international institutions has highlighted that significant reductions of global emissions in all economic sectors (by at least 50% to 2050) are required to avoid the most destructive effects of climate change (Stern, 2006; and IPCC, 2007). In the APEC context, in particular the rapid growth of China has been accompanied by a similar increase of GHG emissions. Air transport is estimated to contribute only around 2% of total GHG emissions, although the actual effect of aviation emissions on the climate may be considerably greater due to non-CO_2 emissions (e.g. sulphur dioxide and nitrous oxides). Furthermore, in light of the sector's forecasted growth, CO_2 emissions from global air transport are projected at over 3% per year for the next 40 years, resulting in a 300% increase by 2050 (IEA, 2008).

Climate change initiatives in APEC and at the multilateral level

Against this background, there has been increasing debate on how to establish policies to reduce aviation's GHG emissions. The task is particularly challenging since emissions from international air transport do not fall under the authority of any single country. Although the potential for environmental mitigation through technological and operational measures is significant, the projected growth rates of the sector mean that such efforts need to be complemented by incentives and regulations in order to cope with the related expansion in emissions. In the context of APEC, progress on international aviation climate policy has been limited. The 2007 Sidney APEC Leaders' Declaration on Climate Change, Energy Security and Clean Development merely identified scope for cooperative action to address air transport emissions, noting the leading role of ICAO in this area.

The current framework for addressing international climate change cooperation is based on the 1997 Kyoto Protocol, established by the United Nations Framework Convention on Climate Change (UNFCCC). However, unlike domestic GHG emissions from aviation, international emissions from bunker fuels are excluded from reduction commitments of Annex I Parties (there is only a requirement that they be reported separately to UNFCCC). Whereas emissions from most other sources (exception made also for maritime transport) are included in developed countries' national targets, the Protocol calls for limitations or reductions from international aviation to be achieved through ICAO. This arrangement was considered appropriate to address difficulties in relation to the UNFCCC standard accounting system, due to the fact that GHG emissions from international aviation involve more than one country.

In response to the mandate, ICAO commenced several initiatives to address emissions from air transport, in particular examining potential emissions standards for the sector, exploring possible operational and technological improvements, evaluating voluntary emissions trading programmes and providing guidance on incorporating international aviation into national emissions trading schemes. However, in light of diverging views among ICAO member states, to date no progress has been made to reach agreement on substantive binding actions. Key issues in relation to reduction targets and policy instruments needed to achieve those targets, such as the gradual integration through an open mechanism of international air transport emissions into national emissions trading mechanisms, remain unresolved. Progress has also been constrained by existing rules under the Chicago Conference, which restrict the right of a member to unilaterally adopt environmental measures on international aviation.

ICAO's limited achievements gave rise to criticism from environmental groups and other stakeholders concerned about climate change, and have prompted some countries to propose alternative paths to reach an international agreement to deal with GHG emissions from international air transport. In particular, in 2009 Australia proposed that aviation's emissions be addressed by a global sectoral agreement under the auspices of the UNFCCC rather than ICAO (Greenair, 2009). Meanwhile, notwithstanding widespread international opposition, the EU has announced plans to introduce both domestic and international aviation under its emissions trading scheme. Asia Pacific economies are also facing growing pressure from society to step up efforts to address the impact of aviation on climate change. Australia and New Zealand are unilaterally incorporating domestic aviation in their national emissions trading schemes (see case study on Australia below) and other countries may follow suit.

Mitigation approaches

Operational and technological initiatives

A number of technological and operational mechanisms are available to reduce GHG emissions from aviation. In the short term, enhancing the efficiency of aircraft operations (e.g. air traffic management) appears the most promising approach. Increased reduction of GHG and other pollutants could further be achieved in the long term through technological initiatives, such as new airframe design and advanced propulsion systems. The use of alternative fuels represents another possibility to contribute to emission reduction targets, with the potential for aircraft to switch to low-carbon biofuels or even hydrogen. However, although airlines are in the process of experimenting with such fuels, their limited availability and high cost mean that these approaches are likely to become a valid option only in the medium to long term (McColum *et al*., 2009). Yet, the potential to mitigate climate change through operational and technological measures is significant, as combining the different options (including alternative fuels), it is projected that annual emissions from global aviation could be reduced by more than 50% in 2050 (IEA, 2008).

In the US, the Next Generation Air Transport System (NextGen) embodies operational improvements aiming at shortening travel distances, reducing congestion at airports and decreasing fuel consumption (US Federal Aviation Administration, 2010). APEC economies are also cooperating to reduce aviation emissions through the establishment of efficiency-enhancing operational measures. A case in point in the realm of air traffic management and operational efficiencies is the ASPIRE partnership involving Australia, New Zealand and the US. Air navigation service providers are working together in international operations to improve efficiencies in main Pacific routes in an effort to reduce fuel burn and emissions. This is achieved through technology in modern aircraft which allows for flexible paths that can be adjusted during flight based on weather or other conditions, permitting considerable fuel savings. The ASPIRE programme is also open to other interested parties (APEC, 2008).

Market-based instruments

Governments have also at their disposal several economic instruments to mitigate climate change. These include general measures (e.g. carbon taxes and emissions trading) and those specific to air transport (e.g. aircraft fuel taxes and airport emission charges). As shown in Table 5 below (Eskeland and Jimenez, 1992), the different policies can also be classified according to whether they dictate GHG mitigation

decisions (so-called command and control) or create economic incentives for operators to reduce pollution; and whether they are direct policy instruments (e.g. emissions trading) or indirect (e.g. carbon or aviation fuel taxes). During the last decade, market-based instruments began to replace command and control regulation when addressing environmental problems, since the latter are increasingly recognised as excessively rigid and inefficient policies.

Table 5. Environmental regulatory instruments for aviation

	Direct policies	**Indirect policies**
Economic incentives	Emissions trading	Carbon taxes
		Aviation fuel taxes
		Tax incentives
Command and control	Mandatory emission standards	Technology standards
	Airport emission charges	Travel restrictions
		Limits on airport development

Emissions trading, which generally entails a cap and trade system[5], is increasingly regarded as a well suited policy instrument to mitigate emissions of a uniformly dispersed pollutant such as emissions of CO_2. This is because it typically entails fewer market distortions than other methods and allows operators more flexibility on how reductions of pollution is achieved. The rationale behind the implementation of emissions trading schemes is to ensure that GHG emission reductions occur where the cost of such reduction is lowest, hence reducing the total cost of climate change mitigation (see Box 4). The view that international emissions trading provides more flexibility and allows lower mitigation costs has been the basis for including it as part for the general reduction targets under the Kyoto Protocol.

Box 4. The economics of emissions trading

Emissions trading was originally described in the seminal work by Dales (1968) and Crocker (1966). It entails setting a ceiling for emissions quantities, which can be applied to an industry, a country or several countries. Participating companies will be granted allowances or permits to emit a specific amount through some allocation mechanism, such grandfathering or auctioning. Since the total level of emissions cannot exceed the cap,

[5] An alternative approach is a baseline and credit programme, whereby polluters that are not under an aggregate cap can create credits by reducing their emissions below a baseline level. These credits can then be purchased by polluters that have a regulatory limit.

companies wishing to pollute more (less) than provided for in their permits, can buy (sell) allowances. As suggested by market theory, the companies will behave according to their marginal cost of reduction (the cost of eliminating an additional unit of pollution). Companies will buy (sell) permits if the marginal cost of reduction is higher (lower) than the price of allowances (Klepper and Peterson, 2006; and de Brauw, 2006).

A general alternative is carbon taxation first introduced by Pigou (1920), which like emissions trading incentivises firms to decrease GHG emissions to a socially optimal level. Carbon taxes are a price-based instrument through which the government increases the cost of carbon and the market determines the efficient quantity. Emissions trading, on the other hand, is a quantity-based policy whereby the market of permits sets the price of carbon. While both approaches lead to the same environmental outcome, with emissions trading market forces allow the allocation of polluting rights to the companies that can use them more efficiently. Companies with relatively low-cost emission control will pollute less in order to sell their permits, whilst those with relatively high-cost emission reduction will chose to buy emission allowances.

Notwithstanding the theoretical advantages of emissions trading, its effectiveness in reducing costs depends on its design and practical application. Coase (1960) was the first to highlight the importance of transaction costs. The complex administrative arrangements of emissions trading (e.g. in relation to allocation of permits) may generate transaction costs large enough to offset the savings from lower mitigation costs. For this reason, several countries are adopting a so-called policy mix to address pollution problems, whereby emissions trading can be complemented by other domestic policies, for example as taxes and subsidies. A policy mix may be particularly well suited where single (first-best) policies involve high transaction costs (Lehmann, 2008).

As noted, Australia and New Zealand have independently put in place (or have advanced plans to establish) emissions trading schemes which include the air transport sector (in addition to the widely discussed emissions trading scheme to be introduced by the EU in 2012), and other APEC economies have put in place voluntary emissions trading[6] (see Table 6 below). Unlike the EU scheme, Australia and New Zealand are excluding international aviation and are planning to cover only the domestic sector. Both countries also include or plan to include all sectors of the economy under their schemes. So far no voluntary emissions trading scheme established by APEC countries includes aviation, though airline operators are beginning to participate in such programmes. British Airways has participated in the UK scheme, operating successfully within the scheme by keeping with its agreed emissions cap (Kershaw,

[6] Notably, the US Congress recently debated legislation on the introduction of a mandatory emissions trading scheme that would cover all aviation fuels (the Waxman-Markey bill). However, the final version of the bill, which passed the House of Representatives on June 26 2009, removed the requirement for direct regulation of air transport. Instead, the legislation would deal with the emissions form aviation indirectly (by including the refining sector they would be addressed upstream). The bill also encourages the development of a global framework to address emissions from air transport under the auspices of ICAO.

2007). Therefore, there appears to be scope for APEC carriers to become increasingly involved in some form of emissions trading.

Table 6. Emission trading schemes covering or potentially including aviation in APEC economies

Programme	APEC country	Date	Description	Coverage	Aviation sector
Carbon Pollution Reduction Scheme (CPRS)	Australia	2011	Mandatory cap and trade scheme with long-term commitment to reduce greenhouse emissions of 60% below 2000 levels by 2050	Comprehensive	Domestic
Montreal Climate Exchange (MCeX)	Canada	2006	Voluntary legally-binding greenhouse gas emissions allowance trading system. It covers greenhouse gas and air pollutants (SOx, NOx), but reduction targets have not yet been set	Voluntary	Airlines have not participated to date
Japan's Voluntary Emissions Trading System (JVETS)	Japan	2005	Voluntary scheme combined with incentives for participants. In exchange for subsidies, companies are required to commit to a certain reduction of emissions per year (around 20% in 2007) relative to their average over the previous three years	Voluntary	Airlines have not participated to date
New Zeeland Emission Trading Scheme (NZ ETS)	New Zeeland	2009	Mandatory cap and trade scheme planned to be extended to cover all sectors and greenhouse gases by 2015. The target is defined by the Kyoto Protocol and post-2012 targets have not yet been decided	Comprehensive	Domestic
Chicago Climate Exchange (CCX)	US, Canada and Mexico	2003	Voluntary cap and trade system with legally-binding commitments to meet annual GHG emission reduction targets. In Phase I (2003-2006) commitments of total reduction by 4% below the baseline; in Phase II (2007-2010) total reduction by at least 6% below the baseline	Voluntary	Airlines have not participated to date

Yet, industry experts have indicated that the unilateral introduction of emissions trading may have potential implications on the level playing field of air transport at the international level. By increasing

airline costs, emissions trading will likely lead to higher passenger fares having an impact on demand for travel. Even if international aviation were directly included, such costs would disproportionally fall on local airlines since the operations of foreign competitors in the country would be more limited. Furthermore, under the so-called "carbon leakage" concept, it is likely that emissions will be transferred abroad, as faced with higher fares visitors may decide to travel to other destinations where such schemes are not in place. Airlines may also be incentivised to renew their fleets and sell their older aircraft to other countries, or even relocate operations offshore (Forsyth, 2008). Some large APEC carriers, such as Singapore Airlines, Cathay Pacific and Quantas, have reportedly stated their concern about the lack of competitive neutrality of emerging domestic emissions trading schemes, since not all airlines are treated equally (Fogarty, 2010).

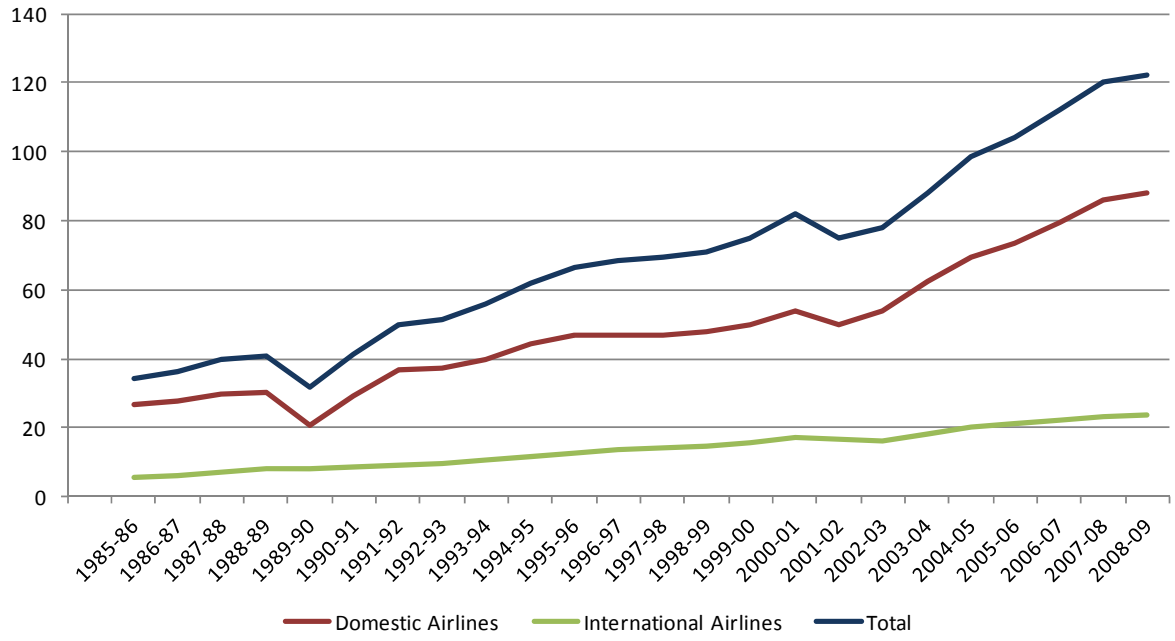
Case study: Australia's emissions trading scheme for aviation

The Australian economy is heavily dependent on aviation, given its vast internal distances and remoteness from other countries. Faced with growing pressure to address carbon pollution resulting from the strong growth of the air transport sector, the Government has announced the establishment of an emissions trading scheme, which includes domestic aviation. The private sector in Australia has expressed concern that the scheme will have potentially serious consequences on the domestic aviation sector, as well as other activities which rely significantly on it (e.g. tourism). Initial evidence supports these fears, with some national companies announcing plans to relocate capacity abroad. The case also shows the dangers for international competition resulting from the unilateral introduction of market based mechanisms to mitigate GHG emissions, even if the policies do not directly cover international aviation.

Background on the aviation sector

The air transport sector plays an important role in linking Australia's economy both internally and to the rest of world. Driven by economic growth, increased tourism and regulatory reform, the sector has been growing strongly over the last 30 years and is also expected to continue to expand at a fast pace. As shown in Figure 2 below, the number of passengers travelling to and from Australia increased from just around 35 million in 1985 to over 120 million in 2009. The country's Bureau of Infrastructure, Transport and Regional Economics (BITRE) estimates that the number of passengers moving through Australian airports will grow on average by 4% annually to 2025-26.

Figure 2. Air passenger movements in Australia (millions)



Source: BITRE.

The forecasted growth poses several challenges for Australia's aviation, including the increasing share of GHG emissions accounted for by the sector. Even though aircraft are considerably more fuel efficient than in the past (about 70% more than 40 years ago), developments in fuel efficiency may not be enough to counter the projected emissions generated by the industry. Macintosh and Downie (2008) project Australia's domestic and international aviation emissions between 2005 and 2050, indicating that they could rise by over 250% over the period, a growth rate incompatible with emission reduction targets needed to avoid the risk of dangerous climate change. The study finds that air transport could account for more than 30% of the nation's total emissions by 2050.

The domestic emissions trading scheme

In an effort to address the increasing challenge of carbon pollution, the Government released in 2008 a Green Paper outlining several strategies and policy proposals (Australian Government, 2008). A pillar of the Government's policy on climate change relates to a long-term commitment to reduce GHG emissions, with a target of 60% below 2000 levels by 2050. Most notably, this is to be achieved through the establishment of an economy-wide emissions trading scheme (the Carbon Pollution Reduction Scheme or CPRS), which will come into effect in 2011. The scheme will include domestic aviation operations under its coverage, though international air transport is to be excluded. The Government has clarified that,

as stipulated in the Kyoto Protocol, emissions from international aviation should be addressed separately through discussions in the context of ICAO.

The CPRS will entail a cap on the amount of emissions from polluting activities. A "carbon pollution permit" will need to be purchased for each tonne of GHG emitted, which will be interchangeable for emissions between the domestic aviation sector and other emitting activities. Thus, trading will aim to ensure that emissions savings are made where they can be met most efficiently. As a complement to the CPRS, the Government has proposed to support the establishment of operational and technological measures to reduce emissions. These include initiatives to work with airlines on the continuing implementation of fuel saving measures (e.g. flexible flight tracks), strengthening aircraft air control sequencing and the introduction of continuous decent approaches.

The local industry and international markets

The announced introduction of the CPRS has generated considerable criticism from the private sector, including beyond the aviation industry. The Tourism and Transport Forum, which represents the interests of Australian firms in the transport, tourism, property and infrastructure sectors, is among those stakeholders urging the Government to consider the likely negative impacts resulting from the scheme (Tourism and Transport Forum, 2008). The Forum maintains that the CPRS will disproportionately affect the domestic aviation sector on which the tourism industry is so heavily dependent, particularly in light of Australia's unique geography. It thus proposes the introduction of complementary measures to help the domestic aviation industry, including accelerated aircraft depreciation and direct assistance through a climate change fund collected from the CPRS revenue.

The CPRS is expected to negatively impact the domestic air transport sector mainly in two ways. First, as seen earlier, airlines may be incentivised to reduce at least part of their emissions by shifting them to other countries (the carbon leakage concept). There are initial signs that this will indeed happen in Australia. The TTF reports that the scheme is causing Jetstar, a national airline which focuses its operations between Australia and South East Asia, to consider moving its hub out of Darwin offshore to Asia. These developments exacerbate concerns that the CPRS will reduce service on leisure and regional routes, where increases in prices have the strongest impact on demand. Faced with difficulties in passing the cost of carbon to passengers, airlines may cease services to these destinations.

In addition, the CPRS may create problems relating to lack of competitive neutrality. The scheme will have the effect of raising the cost of Australian international carriers but not those of their competitors from other countries. TTF and other bodies representing the interests of Australia's service sector indicate that carbon costs for Australian carriers can be significant, according to some estimates by scholars at about 20 million Australian dollars per year, creating a considerable potential for substitution between domestic and international airlines. The case thus shows that the unilateral introduction of market mechanisms, such as emissions trading schemes, could negatively affect the conditions of competition in international markets, even if these markets are excluded from the scheme. Ensuring the competitive balance between airlines in different countries requires avoidance of fragmented national schemes and the establishment of internationally coordinated policy approaches.

IV. Reform options for APEC economies

Over the last ten years or so academics and industry experts have examined a range of policy options available to APEC countries to maximise the gains from aviation liberalisation. The proposals range from reforms within the current bilateral system, to different approaches to construct plurilateral or regional structures between like-minded countries, to progress at the multilateral level in the context of the GATS. Other suggestions entail beginning reforms in what are seen as priority or less challenging areas, such as all-cargo or non-scheduled services, as well as cooperation in other fields like ownership rules. Some of these initiatives can be complementary and may create pressure for progressively expand to wider liberalisation. APEC has also endorsed in the Eight Options a flexible approach to liberalisation on parallel tracks, bilaterally, plurilaterally and multilaterally.

The most promising route to reform appears to be the plurilateral approach. This option could reduce the discrimination inherent in the bilateral system and minimise distortions that may arise from advancing only in specific areas (e.g. all-cargo services). If appropriately set out, this reform path could also provide a stepping stone to multilateral liberalisation, which may be overly ambitious to achieve in the short term. In the context of APEC, the Multilateral Agreement on the Liberalisation of International Air Transport (MALIAT) has been considered in relation to such an approach (see case study below). Yet, so far progress has been prevented by the deadlock of international air transport regulation, which is to a large extent the result of domestic US politics.

Review of proposals on policy options for reform

Liberalisation within the bilateral framework

The reform of air transport through bilateral means has become a prominent feature of the international regulatory environment. An example of this approach to liberalisation are open skies agreements initiated by the US in the second half of the 1990s, which typically grant enhanced market access and relax restrictions in other areas, particularly route schedules, designation, capacity and fares. Findlay (2003) argues that open skies agreements may create pressure for further liberalisation of air transport since in the face of traffic diversion to more competitive routes, countries who have not initially signed up to such agreements may decide to do so. Nevertheless, this reform option retains discrimination against third parties.

Private sector experts have suggested the renegotiation of bilateral agreements, incorporating specific provisions with defined standard terms (ICC, 2005). This approach could introduce some uniformity into the existing bilateral system without changing its basic structure. However, a key challenge would be to ensure that a significant number of countries accept enough common principles on a bilateral basis. The limits on the benefits that could be achieved through bilateral renegotiation can for instance be seen in the case of possible asymmetries in enhanced traffic rights. The ability of operators to exercise new 5^{th} or 7^{th} freedom rights would depend also on the availability of such rights in the air service agreements signed by contracting parties with third countries (OECD, 2002).

Regional and plurilateral reform

An alternative approach to aviation liberalisation is offered by regional and plurilateral agreements, which have proliferated in recent years in the Asia Pacific region. The key challenge relates to ensuring that regional initiatives foster wider liberalisation by adopting an open approach to membership in parallel with the promotion of competition between existing members. Several studies have suggested the development of an "open aviation club" in the region, whereby members would establish open skies agreements among the group, but new members would be allowed to join on the same terms (see e.g. Findlay 1997, and Findlay *et al*., 1998). This model was first discussed by Snape (1996) in the context of preferential trade in goods. It entails a specific set of criteria to ensure openness, including the principle of not seeking to disadvantage outsiders, explicit definition of the terms for including new members and active promotion of wider membership.

Multilateral approaches

It is widely acknowledged that bringing air transport fully under the GATS may not be a realistic option in the current environment. Nevertheless, several commentators have suggested alternative paths that could lead to a more gradual integration of aviation into the multilateral trading system, providing for incremental changes to its specific characteristics (see e.g. Hubner and Sauvé, 2001). As shown in Box 5 below, these proposals revolve around a separation of the sector into traffic rights and activities like ground-based services that could face less resistance to change and may more easily be made fully subject to GATS disciplines. With respect to the former, reform options focus on some form of *conditional* MFN, i.e. opening only to other countries that are willing to take on similar liberalisation commitments.

Box 5. Proposals for expanding the GATS coverage of air transport

Clarify and expand the current GATS Annex

Scope of the definition. Clarify the meaning of services deemed directly related to the exercise of traffic rights, particularly in relation to support activities such as ground-handling services.

Expand the coverage. Address selected services or areas that are more clearly related to traffic rights but may be less challenging to commit to. These include all-cargo transport, non-scheduled services and rules on ownership and control (through commercial presence imbedded in the GATS).

Develop a GATS Understanding on air transport

Reciprocal exchange of traffic rights. Agreement by a core group of like-minded countries to liberalise on a reciprocal basis. Members who decide to join the Understanding would be required to schedule MFN exemptions for their bilateral agreements.

Domestic regulation and competition policy. Develop a set of regulatory principles to safeguard competition in aviation similar to the ones contained in the WTO Reference Paper on Basic Telecommunications. Such principles could be adopted in conjunction with provisions for consultation and dispute resolution potentially arising from such conduct (e.g. as contained in the ICAO model clause for competition).

Arrangements of this sort could potentially evolve from initiatives, including possibly in the Asia Pacific region, involving a group of like-minded countries that agree to reciprocity treatment as set out in an agreement in line with GATS principles. As stressed by IATA (1999), once a critical mass of members

is achieved, the plurilateral agreement could be incorporated into the GATS framework. A plurilateral agreement on aviation within the ambit of the WTO would have the advantage of introducing air transport into the GATS structure without radically changing the current system. WTO members wishing to join could maintain their bilateral air service agreements with third countries and would not be required to offer MFN treatment in the sector.

There are some precedents to this approach in other areas, in particular the 1996 WTO Information Technology Agreement (ITA), which is a plurilateral agreement including both developed and developing countries, initially negotiated outside the scope of the WTO. The number of participants to the ITA has grown from 29 to 70, representing about 97% of world trade in information technology products. In the general WTO talks, interest in this negotiating option has been recently growing in light of the slow progress in the Doha Development Agenda (Messerlin and Van der Marel, 2009; and VanGrasstek, 2009).

A lead sector strategy

Another route to reform is to focus on liberalising specific markets first, such as all-cargo services, with these providing a basis for subsequent opening of other services. Bilateral open skies agreements often include enhanced traffic rights for cargo. All-cargo carriers typically have different priorities than passenger carriers, for instance in terms of routing needs and network strategies and, as such, they call for separate negotiation of traffic rights and other restrictions. Air cargo services may also attract less resistance to reform than passenger services (on both economic and public policy grounds) and experience with liberalisation in the sector may contribute to the debate on reform of the air passenger sector.

At the same time, the separation of air cargo and passenger reforms has been contentious in the Asia Pacific region, in light of the different characteristics of the air freight market. Average journey lengths are higher in Asia and most passenger airlines (e.g. China Airlines, Cathay Pacific and Japan Airlines) operate wide-bodied aircraft, generating a considerable share of their total revenues from the carriage of freight. In the US, on the other hand, passenger carriers rely on narrow-bodied fleets and the cargo market is dominated by all-freight carriers, particularly integrated express operators. As a result, while attention should be paid to the specific needs of all-cargo carriers, a balanced approach is required, which takes into account the interests of different types of operators and does not distort competition to the detriment of Asian carriers (Zhang and Zhang, 2002).

Ownership rules

Easing rules on ownership and control has also been proposed as a way to achieve more open markets. This would consist in countries providing for new rules on rights of establishment relevant to flying operations, including in relation to domestic markets. At the 2003 ICAO Worldwide Air Transport Conference, member states agreed to give consideration to a model clause on designation as an option to use in their services agreements. The model clause calls for relaxation of the ownership criteria and for separating commercial ownership from regulatory control (ICAO, 2003). The underlying principle is that in a liberal air services regime the right to fly would not depend on the identity of the provider, but rather on whether the latter maintains a strong link with the designating state, complying with the regulation applicable therein (Findlay and Round, 2006).

Case study: The MALIAT as an open aviation club in APEC

The MALIAT is the first plurilateral aviation agreement not part of a specific preferential regional initiative ever to be signed. It includes among its members the US, the world largest aviation market and among the major sources of resistance to multilateral reform of the international regulatory system for air transport. The Agreement has thus attracted interest by experts with respect to its features as an open aviation club, and to its possible role in bringing about broader liberalisation of the sector. The case study shows that the MALIAT has partially succeeded in breaking the stalemate of international air transport regulation, though two prominent impediments remain in place: restrictive ownership rules and the omission of cabotage rights. One possible avenue to gradually tackle these restrictions is the promotion of a liberal policy on wet leasing.

Background

The Multilateral Agreement on the Liberalisation of International Air Transport was negotiated at the end of 2000 in Hawaii and signed in Washington on 1 May 2001, by Brunei Darussalam, Chile, New Zealand, Singapore and the US. The Cook Islands, Mongolia, Samoa and Tonga have also signed on to the Agreement, while Peru after initially joining, subsequently withdrew from it (MALIAT, 2005). The MALIAT is often cited as an example of progress towards the Bogor Goals, with the Preamble to the Agreement stating the desire of members to "promote an international aviation system based on competition among airlines in the marketplace with minimum interference and regulation".

In line with the Preamble, existing members have been developing ways to foster the progressively broadening of the Agreement's membership. To introduce flexibility, an option has been built in for

allowing 7th freedom for passengers and cabotage under a separate Protocol, which has so far been signed on to by Brunei Darussalam, New Zealand, Singapore and Chile. An all-cargo agreement was further developed as an initial step for interested aviation partners that may not yet be ready to take on full obligations on passenger services.

Assessing the Agreement as a model for open club

Findlay (2003) represents to date the only study that benchmarked the MALIAT against the core criteria of an open club. The study finds that the Agreement has some desirable features, especially in relation to its extensive coverage of traffic rights, fares and capacity, as well as its transparency (see Table 7). However, there are several important provisions of the MALIAT that limit its value as an alternative to the existing bilateral air transport system. For instance, ownership rules, although more liberal than most open skies agreements in that they eliminate the more restrictive "substantial ownership" requirement, could be further relaxed as they retain the "effective control" as well as the "principal place of business" clauses. Cabotage, the ability to fly between two points within a foreign country, is also excluded from the main provisions of the Agreement.

Table 7. MALIAT as a model for open club

Principles	Liberal/included	Restrictive/excluded
Route schedule	√	
5th freedom	√	
7th freedom for passengers		√
7th freedom for cargo	√	
Cabotage		√
Designation	√	
Fares	√	
Capacity	√	
Withholding	√	√
Code-sharing	√	
Competition policy		√
Dispute settlement	√	
Accession		√
Transparency	√	

The study further highlights the limitations of the MALIAT in the area of competition policy, where the main provisions only address access issues relating to computer reservation systems. Although existing clauses on dispute settlement are a step in the right direction as they could help in dealing with potential anticompetitive behaviour, they may not be enough to address the range of existing competition

policy issues. Finally, the accession clause would need to be strengthened so that new members could join the Agreement on exactly the same terms, particularly by limiting the possibility for incumbents to deny membership to potential entrants.

Tackling the most difficult impediments

To date, after almost ten years since the MALIAT entered into force, there has been little enthusiasm from other countries to join. As Findlay (2003) had suggested, this lack of interest stems from the fact that the Agreement does not offer to potential new entrants enough benefits in terms of coverage to compensate for the threat posed by the pro-competitive effects of more integrated markets. Indeed, the MALIAT only partly breaks the deadlock of aviation regulation in the Asia Pacific region. This can be thought of as a form of asymmetric hub-and-spoke system whereby US carriers can reap the benefits of such system in Asia, while distortions in the protected US market deny Asian airlines the same gains. Through its web of bilateral open skies agreements, the US has typically afforded its carriers better access to a range of Asian spokes than did spoke airlines among themselves in the region. At the same time, a restrictive policy on cabotage effectively shields US carriers from foreign competition at home.

The MALIAT has partly eroded this advantage by allowing non-US carriers access between points in countries inside the group. Yet, the unwillingness of the US to reform its protected domestic market is among the principal barriers to advance reform in the region. At the core of the problem are two provisions which remain (largely) restrictive in the MALIAT as seen earlier: rules on ownership (so that the right to fly would not be dependent on the identity of the provider) and cabotage. These two regulatory provisions have been particularly difficult to address in US politics, in the face of strong opposition from domestic carriers. The situation is very similar in Europe, previously through the web of bilateral open skies between the US and individual EU countries, and more recently with the EU-US open skies agreement. Indeed, the UK expressed concerns that EU carriers will not be allowed the same rights on domestic routes within the US, as those afforded to US carriers in the EU (BBC News, 2007).

While progress on liberalising ownership rules and cabotage may be slow in the face of significant political economy obstacles, other options that could allow for a gradual transition in this area could be explored. An interesting proposal in the context of the EU-US open skies relates to wet leasing (with flying personnel). EU officials have reportedly stated that such practice, whereby a European carrier could fly under its own flag using aircraft and crew of US airlines, is a priority for the next phase of the negotiations (Ezard, 2008). This approach, while avoiding interference with sensitive issues of ownership, would grant carriers the right to fly on all routes in the EU and the US, through the leasing of aircraft and

crew from airlines registered therein. A similar reform option could also be explored in Asia Pacific in the context of the MALIAT.

V. Emerging implications for APEC economies

This study examines the role of regulation and remedial policies for the successful liberalisation of the air transport sector in the Asia Pacific region. The focus is on how to minimise the downsides potentially stemming from reform in the sector. Based on case study analysis, it discusses prominent competition policy and environmental issues arising in the aviation sector and examines initiatives that are being taken to address these concerns at both national and international levels. The study also explores negotiating options available to economies in the region to maximise the gains from air transport liberalisation. It analyses the role that ongoing initiatives in the APEC context could play in efforts to lead to broader liberalisation of aviation and to progressively integrate the sector into the multilateral trading system. To this end, it provides suggestions on how to tackle the most challenging restrictions.

The analysis undertaken clearly shows that the once at least partial immunity of air transport from competition law is coming to an end. This is most notable from the recent major price-fixing investigation in relation to the implementation of the fuel surcharge system, which is one of the largest and most far-reaching that ever took place. There have also been numerous allegations of predation following liberalisation in advanced APEC economies. Although proven cases of predation remain rare, some initial decisions found that airlines engaged in predatory pricing, particularly against low-cost competitors. Furthermore, the increasing imbalance between demand and capacity in hub airports around the world is exacerbating concerns about the potential negative effects on competition stemming from the existing IATA based system of slot allocation. This is apparent in the APEC context where the capacity share of incumbent carriers in hub airports remains very high.

At the same time, there is growing understanding of these issues and associated best practices are emerging, which could be drawn upon in designing and carrying out competition law. For starters, there is recognition among competition experts of the need to avoid blanket prohibitions of business practices, such as airline alliances, which may significantly enhance efficiency and benefit consumers. Instead, it is important to discern harmful anti-competitive behaviour and to provide effective and targeted remedies. Allegations of predation have contributed to the development of increasingly sophisticated rules in affected countries, building on theoretical contributions in an attempt to identify instances of predatory practices. In addition, decisions by authorities finding cases of predation have established principles which will be

relevant in possible future cases of predatory behaviour. Moreover, excessive demand in congested airports has spurred consideration of gradual approaches towards market-based mechanisms for slot allocation, among which secondary trading figures prominently.

It is also apparent that pressure to deal with emissions of GHG from aviation is mounting. Although the potential for environmental mitigation through technological and operational measures is significant, the projected growth rates of the sector mean that such efforts need to be complemented by effective incentives and regulations in order to deal with the related expansion in emissions. Governments have thus progressively been adopting economic instruments to mitigate climate change. Emissions trading is increasingly regarded as a well suited policy mechanism to mitigate emissions of CO_2, since it typically entails fewer market distortions than other methods and allows operators more flexibility on how reductions of pollution is achieved. Several APEC economies are considering establishing emissions trading for their aviation sector, and Australia and New Zealand have incorporated (or have advanced plans to do so) domestic air transport in their national emissions trading schemes.

Yet, in all these areas, the unilateral imposition of remedial policies may have wide-reaching consequences for aviation. The case study on fuel surcharges shows the potentially biased results that even an investigation successfully coordinated at the international level can have on poorer countries, which cannot protect their citizens from unlawful behaviour in the absence of well developed competition law and enforcement authorities. The damages are likely to be significant in light of the important role that air transport plays in international trade. Indeed, the conspiracy had a negative impact on different market participants and on all consumers through higher retail prices on the products affected. Similarly, as shown in the Australian case study, independently introducing policies such as emissions trading can have potentially serious consequences on both the domestic aviation sector (and activities such as tourism that rely significantly on it) and on aviation's level playing field at the international level. APEC economies would thus do well to step up cooperation and achieve substantive progress on these issues.

The most promising route to reform of the aviation sector appears to be the plurilateral approach. This option could reduce the discrimination inherent in the bilateral system and minimise distortions that may arise from advancing only in specific areas. If appropriately set out, this reform path could also provide a stepping stone to broader liberalisation of the sector, including possibly to progressive multilateral liberalisation. In the context of APEC, the MALIAT has been considered in relation to such an approach. The case study shows that the MALIAT has partially succeeded in breaking the stalemate of international air transport regulation, though two prominent impediments remain in place: restrictive

ownership rules and the omission of cabotage rights. One possible avenue to gradually tackle these restrictions is the promotion of a liberal policy on wet leasing. This approach, while avoiding interference with sensitive issues of ownership, would grant carriers the right to fly on all routes through the leasing of aircraft and crew from airlines registered in other countries.

VI. Conclusions

The economic significance of air transport services means that they are high on the list of development priorities of many Asia Pacific economies. Advancing reform in the sector, though, is a complex issue and will need innovative thinking on how to tackle the most challenging impediments, within the limits imposed by political economy factors. At the same time, liberalisation needs to be accompanied by appropriate regulations to correct for market failures and, in light of the international nature of regulatory issues in aviation, a coordinated international response on these issues is required. The empirical analysis conducted in recent studies provides evidence on the important benefits potentially stemming from liberalisation of air transport in APEC. As this study shows, particularly in light of the important role the sector plays for other kinds of trade, failure to appropriately tackle regulatory issues may have negative effects of a similar nature.

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