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THE AIR TRANSPORTATION POLICY OF SMALL STATES: MEETING THE CHALLENGES OF GLOBALIZATION

Andreas Antoniou
Philips College
Nicosia, Cyprus

ABSTRACT

The air transport policies of small states are currently at a crossroad. Policy makers in these countries are facing a difficult dilemma: either follow the general trend of liberalization and pay the high cost of the resulting restructuring or maintain the existing regulatory and ownership structures at the risk of isolation thus undermining the viability and sustainability of their air transport sector and their economies in general. This paper proposes to explore the broad issues raised by this difficult dilemma, to outline its special significance in the context of small states and to delineate the options opened to the economic policymakers in these states. After a brief note on the method of research, we sketch the main elements of the international air transport industry in which the airlines of small states are called upon to act. We then propose to review the main features of the analytical framework of this debate as it pertains to the special circumstances of these states. Then we focus on the challenges facing the airlines of Small States, while the next section proposes a number of the alternative policy options open to the policy makers in these states. The main conclusions are drawn in the final section.

INTRODUCTION

Small states[1] are especially vulnerable to exogenous shocks and are facing the increasingly difficult task in meeting the challenges of globalization. The international community has long recognized this fact and several multilateral institutions and donor countries have taken a number of initiatives to assist these states to overcome this handicap. The economies of these states are often dependent on a single industry that is often their main, and sometimes the only, source of foreign currency.

Andreas Antoniou holds a Licence and a Maitrise es sciences economiques-econometrie from the Universite de Paris I (Pantheon-Sorbonne). He obtained a MA degree from the University of Essex and a Ph.D. in Economics from McGill University. Before becoming Head of the Department of Business Studies at Philips College, he taught at several universities in Canada, and the University of the Witwatersrand in Johannesburg. His recent research interests include Oligopoly in a Game-Theory framework and Air Transport Economics. Until recently he was a Member of the Advisory Board to the Commonwealth Secretariat/World Bank Task Force on Small States.

Furthermore, because most of these small states are geographically isolated from their main trading partners, air transport is often the main link to the outside world both for the transport of passengers and freight.

At the same time, many states have embarked on a major effort to overhaul and liberalize their air transportation markets. Some countries, inspired by the relative success of similar policy changes in other countries such as the U.S. and the EU, have done so willingly, although not without painful sacrifices, while others maintained a (healthy) dose of scepticism and thus remain reluctant to move in the same direction. Small states are no exception, and their air transport policies are currently at a crossroad. Policy makers in these countries are facing a difficult dilemma: either follow the general trend of liberalization and pay the high cost of the resulting restructuring, or maintain the existing regulatory and ownership structures at the risk of isolation thus undermining the viability and sustainability of their air transport sector and their economies in general.

This paper proposes to explore the broad issues raised by this difficult dilemma, to outline its special significance in the context of small states and to delineate the options opened to the economic policymakers in these states. The research method adopted in this study, is primarily desk research, laced however with healthy dose of the author's access to, hitherto, unpublished primary information and informal private interviews. The next section outlines the main elements of the international air transport industry in which the airlines of small states are called upon to act. The main features of the analytical framework of this debate follow this section as it pertains to the special circumstances of these states and the challenges facing the airlines of small states. Based on these findings, alternative policy options and recommendations open to the policymakers in these states are discussed. Finally, the main conclusions are drawn.

A NOTE ON THE RESEARCH METHOD

This is a policy-oriented paper, rather than a theoretical or an empirical work, and as such its main objective is to evaluate the policy options confronting the aviation industries of small states, within the existing institutional framework, based on well-grounded economic principles. The main source of information regarding the institutional environment and the relevant analytical framework was desk research on the various key aspects of this, otherwise convoluted, subject involving several international agencies and different strands of literatures. However, as member of the Advisory Board to the Commonwealth/Word Bank Joint Task Force (CSWB Task Force) on Small States for several years, the author was able to participate in several, panel discussions, study groups and seminars, as

well as have access to numerous published and unpublished original research material, involving several aspects of the economies of small states. In addition, as a discussant and commentator on several of the papers that were considered and/or commissioned by the CSWB Task Force, he conducted several informal interviews with key policymakers and had the opportunity to acquire first-hand experience on some of major globalization challenges facing small states. In fact, it is in the context of these activities that it became clear to this author that the formulation of a coherent air transportation policy, enabling small states to meet the challenges of globalization, has to become a major priority for them and a subject in dire need for additional original theoretical and empirical research.

SMALL STATES AND THE INTERNATIONAL AIR TRANSPORT INDUSTRY

In addressing the issue of the air transport policy of small states one is faced with a multifaceted reality covering a wide breadth of issues. These range from the sector-specific regulatory framework facing decision-makers, namely the system of multilateral agreements established within the context of ICAO (1992, 1993) and the various bilateral agreements currently in effect, as well as the wider nexus of regional and multilateral trade, economic and political relations. Clearly, therefore, anyone attempting to pinpoint and isolate the salient elements of this framework is facing a daunting and a somewhat arbitrary task heavily tainted by the idiosyncrasies of the analyst. It is, nevertheless, possible to identify the prominent global trends that are currently shaping the industry, and are likely to do so in the foreseeable future.[2]

During the last few years, the Commonwealth Secretariat and the World Bank (WB) undertook a sustained and concerted effort in recognizing and addressing the developmental needs of small states. As more Multilaterals and other International Financial Institutions (IFIs) are drawn into this process, new economic challenges and opportunities will become available for these states. Nevertheless, given the dominance of the U.S. economy on the world stage and the increasingly aggressive stance adopted by the EU in international economic affairs, it is safe to assume that developments in the international air transport field will, to a great extent, be determined by the policies of these two economic superpowers. In addition, and notwithstanding the demises of the Seattle meeting, the World Trade Organization (WTO) is bound to increasingly become the main forum in which nations will be attempting to sketch the broad institutional

framework that will shape future trade relations in general, and trade in air services in particular.

Small States: Meeting the Challenges in the Global Economy[3]

In 1985 the Commonwealth Secretariat (ComSec) published a ground-breaking report on the Vulnerability of Small States in a Global Economy (ComSec, 1985). Since then, ComSec has carried out a sustained advocacy and research effort addressing the special characteristics of these states which culminated in 1998 with the establishment of Commonwealth Secretariat/World Bank (CSWB) Joint Task Force.

For the purposes of the CSWB Joint Task Force, small states are the 44 developing countries with a population below 1.5 million people. Thirty-three of these countries belong to the Caribbean region, East Asia and Pacific and Africa while the remaining two are in South Asia, two in the Middle East and three in Europe (ComSec, 1985, 1997). Note that although there is some overlap, this is not the same group of 33 countries that are included in the United Nations' Conference on Trade and Development (UNCTAD) study on Small Island Development States (SIDS) (United Nations, 1994). Also note that although their population is over the 1.5 million threshold, for the purposes of the Task Force, Jamaica, Lesotho, Namibia and Papua New Guinea are included among the Commonwealth Small States "because they share many of the characteristics of smallness" (1985, p. 4). These characteristics, chosen for their important implications for development are: remoteness and insularity, income volatility, susceptibility to natural disasters, limited institutional capacity, limited diversification, openness, access to external markets, and poverty.

At the beginning the purpose of the CSWB Joint Task Force was to "assess the case for special treatment advanced by the Commonwealth small states at the Edinburgh Heads of Government Meeting and enable the [World] Bank to examine its instruments for assisting these countries…" (p. 1). After a series of consultations, conferences and the publication of an Interim Report, the agenda was widened and number of multinational institutions (i.e. the EU, the WTO, the International Monetary Fund, the United Nations, the United Nations' Development Program, and major regional development banks) and major donor countries were asked to submit frameworks.

The final report defines a measure of vulnerability and identifies the economic implications of small size and the emerging challenges. In addition, it addresses the policies, challenges and opportunities that these countries are likely to face in the immediate future. These include, inter alia, ways of tackling volatility, and mitigating vulnerability and natural disasters—such as catastrophe insurance and commodity risk management,

issues of transition to the changing global trade regime—such as the erosion of trade preferences, strengthening capacity and external assistance, and the new opportunities from globalisation—like international financial services, information technology and e-commerce.

> The Task Force concluded that addressing these challenges successfully will take a combination of the following: correct domestic policy action; in some cases new approaches to regional co-operation; continued external support and assistance multilateral and bilateral development institutions; and improvements, where achievable, in the external environment (ComSec 2000, p. 3).

Although the Report does not make specific reference to international air transport as such, it is nevertheless clear to us that the issues tackled therein, and many of its recommendations as set out above, have immediate and direct relevance on this specific sector. In particular, we argue in this paper that the challenges that the airlines of small states currently face must be addressed in the framework outlined this Report and in particular as a combination of the "right" domestic air transport policy, coupled with new approaches to region co-operation in aviation policy.

International Air Transport Policy in the U.S. and the EU

The U.S. "Open Skies" Policy

The U.S. has traditionally advocated an "Open Skies Regime" in its negotiations with other countries, although with limited success. For Toh (1998), the decisive impetus came at the end of 1978 when the U.S. Congress adopted the Airline Deregulation Act and in 1979 with the passage of the International Air Transportation Competition Act. As a result, U.S. negotiators endeavoured to "trade competitive opportunities" in their bilateral negotiations, a strategy that best describes the policy stance that ensued. Indeed, Toh (1998) argues that the aim of this policy was

> …to ensure that mutual concessions were to be of a liberalizing nature. It was expected that increased open competition will result in greater consumer benefits through increased travel options and reduced hares and rates, improved airline efficiencies through more extensive and rational routes structures, and general increase in economic welfare (pp. 62–3).

The repercussions of this policy were the negotiation of a series of "liberal" bilateral agreements between the U.S. and several Far Eastern countries, as well as with a number of "key" European partners. By and large, these agreements gave the U.S. airlines significantly greater pricing freedoms, enhanced market access through multiple carrier designation, unlimited freedom to set capacity and a curtailment of (host) government regulations. Several major European countries and Japan were, at first,

reluctant to follow the U.S. on its "Open Skies" policy, fearing the domination of their markets by U.S. carriers.

In fact, the choice of "consenting" partners was dictated by three key considerations. Contrary to large countries, small states generate relatively little third and fourth freedom traffic thus standing to gain more from greater access to the lucrative U.S. market and, through fifth freedom traffic, beyond. This prospect made them more willing to trade "competitive opportunities" with the U.S. Furthermore, there were also strategic considerations in the choice of these partners. McMillan (1989) argues that, from a game-theoretic perspective, in trade negotiations the bargaining power of a country is directly proportional to the concessions it is willing to exchange.[4] In this context, it is clear that small (underdeveloped) states individually are "ideal" trading partners, with virtually zero bargaining power vis-à-vis the U.S.[5] Furthermore, partners were also chosen on the basis of the stated "encirclement strategy". Indeed, U.S. policymakers (correctly) anticipated[6] that by signing a series of liberal bilateral agreements with minor alternative European and Far Eastern gateways, will bring pressure to bare on major competing partners (such as France, Italy, Britain and Japan), by diverting traffic to these alternative cheaper destinations.[7]

It is well documented and thus legitimate to argue that the world aviation industry has undergone major changes since the adoption of the "open skies" policy. These changes include, inter alia, the decline in IATA's cartel-like tariff-setting ability,[8] the gradual emergence of mega-carriers through airline consolidation, the prolifaration of strategic alliances between major carriers, the drive towards privatazation of national carriers and the deregulation of national markets. However, notwithstanding the declared pro-competitive aim of this policy, Abeyratne (1998) argues that

> …it cannot be claimed incontrovertibly that an open skies policy…is not totally lacking in overprotectiveness. Most nations [including the U.S.] still give usually high priority to the marketing policies of their airlines, which are naturally geared to world protectionism and exploitation (p. 40).

In fact the author offers evidence suggesting that several developing countries view with certain suspicion this policy, considering the great reluctance by the U.S. (and other developed countries) to open-up their own domestic markets to market forces.[9]

In addition, according to Wassenbergh (1996), quoted by Abeyratne (1998), it would seem that the very concept of "open skies" is itself not unambiguous and appears to have evolved in the framework of successive bilateral agreements. Whereas it was first understood that a necessary and sufficient condition for its implementation was that the carriers of both signatories had a fair and equal opportunity to operate, it was later "re-

interpreted to mean *fair and equal opportunity to compete* and later still, *fair and equal opportunity to effectively participate* in the international air transportation as agreed." (Abeyratne, 1998, p. 41). Although the "open skies" policy "a la U.S." still faces major obstacles and strong opposition in many countries (Toh, 1998, pp. 64–66), there is no doubt that it has been the decisive factor in the general drive towards enhanced competition and greater efficiency in international air transportation and, as a result, "protectionism in commercial aviation should give way to some degree of liberalization in the least" (Abeyratne, 1998, p. 40).

The EU Common Air Transport Policy

The need for a Common Transport Policy is explicitly acknowledged in the Treaty of Rome (1958) as being an integral part in the construction of a Common European Market. But, the efforts for the definition of a Common European air transport policy began only in 1975 with the publication of a relevant European Commission (EC) Recommendation, followed by a 1979 EC Memorandum on bilateral agreements and state subsidies. Nevertheless, for Morrell (1998), and many other informed observers, it was the landmark 1984 "Nouvelles Frontieres" European Court of Justice (ECJ) ruling and the adoption of a Single European Act that were the decisive steps towards the formulation of a Community-wide aviation policy.

However, contrary to the U.S. one-shot-total-liberalization approach, the European model called for a gradual and protracted process going through successive packages/stages, spanning from 1988 to 1997 (Stasinopoulous 1992, 1993). The first two packages called for gradual "loosening" of intra-European bilaterals, while

> …the third package of 1992 for the first time replaced the bilateral system with a multilateral system of air transport regulation. It established common rules for the award of an air operator's certificate, open access to air transport routes within the Community, and the freedom to set airfares and rates according to commercial criteria. These rules moved away from the requirement of national ownership and control by creating the concept of a Community air carrier…open[ed] up traffic rights on all intra-Community air carriers (with full cabotage from 1997), with few exceptions, and remove[d] capacity restrictions (Morrell, 1998, p. 46).

In order to mitigate and anticipate some of the negative effects that U.S. deregulation has had on U.S. consumers, the EU decided to also include consumer protection in its Common Air Transport policy. For the EU Commissioner for Energy and Transport Ms. Loyola de Palacio the development of a "Passenger's Charter," "would establish in the clearest possible terms a set of consumer rights" (European Commission, 2000,

p.3). The Charter will be addressing issues "…such as the contractual rights of passengers, tariffs, comfort and health…financial protection of the passengers in case of air carrier bankruptcy, air carriers' commercial practices like code sharing and frequent flyer programmes and information to the passenger" (pp. 4–5).

In assessing the impact of these liberalization measures on EU consumers, Morrell (1998) argues that although several significant barriers remain—including administrative, infrastructure capacity constraints, imperfect input markets, economies of scale and lack of access to adequate finance—between 1992 and 1994, EU travellers benefited "…from air fares [that] were on average a little more than ten percent below the levels that they would have been without liberalization" (p. 59). Furthermore, Alamdari (1998) concludes that these measures also had beneficial effects on the labour productivity of EU carriers and that

> …in the period 1991 to 1995, unit labour costs fell by approximately 38 percent as a result of the fast growth in productivity. In the same period, wages only increased 15 percent on real terms. It appears that the airlines were paying their staff only slightly more for proportionately greater productivity. This is possible because an increase in outsourcing has a tendency to increase the average unit labor cost by reducing the number of lower paid employees while boosting productivity (p. 82).

Air Transport Services Trade and the GATS

The Services Trade debate

Trade in aviation services is a prime example of services trade[10] and as such were at the centre of the efforts to liberalise trade at a multilateral level during the early 1980s. The discussion on commercial policy in services trade has centred on the antagonism between the developed countries, under the leadership of the U.S., and the developing countries guided by India and Brazil. The controversy was sparked by the reluctance of developing countries to include services in the multilateral trade framework. This unwillingness was primarily motivated by two sets of concerns: economic and non-economic reasons. On economic grounds, developing countries believed, as argued by Bhagwati (1985), that industrial countries enjoy a clear comparative advantage in services and any liberalization would therefore compromise their own export in services. A number of countries suspected that the new focus on services was used by the U.S. to distract attention from the main issue at hand, namely the trade in goods for which they enjoy a comparative advantage, especially in labour-intensive goods. Sapir (1985) and Hindley (1988) argue that although both concerns had some empirical support, developing countries could also benefit from cheaper imports of services, especially

when they are used as intermediary inputs. However, there are other more profound economic reasons behind the stance adopted by many countries during these negotiations. National governments, especially in developing countries, will engage in the process of liberalization of international services trade only if this will be a net benefit for the development of their respective economies. Indeed, Sampson (1989) observes that the contribution of imported services to economic development is not merely limited to them being imported factors of production or consumption. Imported services could contribute significantly to the international competitiveness of an economy, the efficiency of domestic production, domestic relative prices, and the structure of production and the allocation of domestic resources.

Furthermore, it is a well known that services are prone to regulation for non-economic reasons. In particular, the liberalization of the trade in services often implies the substitution of internationally uncompetitive domestic services activities with services supplied by foreign producers. Thus trade in services often implies the importation not only of the service as such, but also of foreign labour and capital which could be contrary to national provisions. In addition, given that services include some of the most politically, militarily and culturally sensitive (infrastructure) activities, governments are often reluctant to surrender their provision and control to foreigners.

We note here that both these sets of arguments were particularly relevant to small states because they are especially sensitive to matters pertaining to their national sovereignty and economic independence. In fact one can argue that debate surrounding services trade epitomises many of the grievances of small states with respect to the emerging trading regime in a globalized economy (ComSec, 2000).

The eventual inclusion of services in, what is now commonly referred to as the Uruguay Round of GATT negotiations in Punta del Este was the result of a compromised brokeraged by the, then, European Community. The series of negotiations under the Uruguay Round eventually culminated in a framework agreement distinct from that on goods and known as General Agreement for Trade in Services (GATS).

Recall that following Bhagwati (1985) and Sampson and Snape (1985), it is useful and customary to classify the modes of delivery of services on the basis of the required physical proximity between Users and Providers. According to the typology of international transaction in services[11] there are four possible modes of delivering services. Mode 1, in GATS parlance **Cross Border Supply**, requires that neither the Users nor the Providers need to move (like in commodity trade). Mode 2, known as **Consumption Abroad**, implies that Users have the freedom to move (either temporarily

or permanently) but Providers do not. In Mode 3, also known as **Commercial Presence**, Users do not move while Providers have the freedom to establish or operate a branch, agency or subsidiary. In Mode 4, called **Presence of Natural Persons**, Users do not move but now Providers may enter and stay temporarily in order to supply the service.

In fact, Sapir and Winter (1994) argue that, as far as GATS is concerned, the most contentious issue has been the interface between these four modes of delivery and the participation of the developing countries. It is in this context that some industrial nations used the application of the principle of the **most-favoured-nation** treatment (MFN)[12] as a bargaining chip against granting freedom of establishment.[13]

Alternatively, some nations proposed a symmetric treatment of labour and capital as far the 'right of establishment' is concerned as a means of overcoming the developing nations' reluctance. Eventually, the GATS framework agreement signed in 1994 established, under Article II, MFN as a general obligation applicable to all measures affecting trade in services. Furthermore, signatory states submitted (schedules) of specific commitments pertaining to **market access**, namely the ability of foreign providers of services to penetrate domestic markets, and **national treatment**, an obligation prohibiting discrimination on the basis of foreign nationality. Although GATS offers only a partial coverage of air transport services,[14] it is the only sector amongst the limited number of sectoral annexes to the Agreement where an explicit "positive list" of services covered is provided. These services are (a) aircraft repair and maintenance services, also known as maintenance, repair, and overhaul (MRO); (b) computer reservation system (CRS) services; (c) the selling and marketing of air transport services.

The GATS Annex on Air Transport Services

A recent WTO (1998) study looks at the trade in Air Transport in Services in the context of GATS. It notices that paragraph 2 of the Annex excludes the granting of traffic rights from GATS as well as the services directly related to the exercise of these rights. However, the above three services contained in paragraph 3 are excepted from the exclusion are therefore covered under GATS. Furthermore, the study notices that while the above three services are the only services 'directly related to the exercise of traffic rights' that are covered, the wording of the Annex implies that those services that are not directly related to the exercise are also covered.

Looking at these sectors separately, starting with MRO, the study observes that recent estimates (based on 1996 data), value this market at

between U.S.$23 and 28.5 billion, forecasted to reach by 2005 U.S.$33 (WTO, 1998, pp. 2–3). Furthermore, it is customary to sub-divide MRO into different segments: upkeep of engines, representing 30 percent of turnover, heavy maintenance of airframes (27 percent), line maintenance (22 percent, not covered under GATS), and upkeep of components (21 percent).[15] There are also different types of operators active in these markets, such as, airlines working on own account ("airline captives"), airlines working on behalf of other carriers ("airline third party"), after sales services by original equipment manufacturers (OEM). The WTO study notes that in recent years, there is a growing trend for joint ventures between these types of operators. Clearly though, the key issue as far as regulation is concerned is flight safety and quality. At the multilateral level, standards and regulations are determined within the framework of ICAO (1994, pp. 31-34), while national authorities and bilateral agreements may also have a significant impact on air safety.

Clearly the delivery of MRO's fall under either Mode 2 or Mode 3 and are, respectively, determined by the freedom of consumption overseas and of establishment of foreign maintenance facilities in third markets. Referring to Table 1 in the Annex of the study (compiled by ICAO, not included here), the WTO notices that all except one WTO Members have MFN obligations on air maintenance and that there was, between 1995 and 1998, a "general increase in the number of new facilities established" (WTO, 1998, p. 4). It also notices however, that "this is more likely to result from market growth than from the effects of GATS, but…that six of the 13 newly created facilities have been in countries with GATS commitments in this sector" (p. 4). In the case of small states however, a slightly different picture seem to emerge. It would seem that, as far as MRO are concerned, for the period 1995–1998, these states have not benefited from GATS since none has had or has acquired any new repair and maintenance facilities.

Turning to the computer reservation system (CRS) services, GATS defines them "as services provided by computerized systems that contain information about carriers' schedules, availability, fares and fare rules, for which reservations can be made or tickets may be issued" (WTO, 1998, p. 4). In the classic pattern of CRS operations, customers do not have direct access to the information provided by the CRS supplier.[16] They use the services of an agent who acts as a broker between the customer, and the airline and CRS provider. Because CRS providers started as subsidiaries of major airlines, this segment of the market (with an estimated annual turnover of U.S.$4 billion) is highly concentrated, with growth estimated up to 2015 varying between 3.6 percent to 5.5 percent annually. For the classic pattern, the main concern from the regulatory point of view was the danger of collusion between the CRS supplier and a specific carrier and the

need to ensure a non-discriminatory treatment of the all airlines in the system. This objective was by-and-large achieved through the adoption by the major aviation powers, the U.S. and EU authorities, of Codes of Good Conduct instituting on a neutral quid pro quo system. This amounted to reciprocity-based treatment, which of course were subject to MFN exceptions, also accompanied by the establishment of major suppliers. In fact the WTO study notices that in terms of the GATS mode of supply introduced earlier, trade in CRS services are essentially carried under Mode 3, namely through the establishment in each country of National Marking Companies (NMC) with which the local airline or travel agents are associated. In some cases NMC are used as spring boards for export in neighbouring countries, which means that CRS services can also be supplied under Modes 1 or 2 or even mode 4. Looking at the effect that the existence of commitments has had on the export of CRS services, the study concludes that, "there seems to be no correlation between the development of the number of suppliers and the existence of commitments"(WTO, 1998, p. 11). Again focusing on small states it can be inferred from the same table, that, by and large, they benefited from the arrival of new suppliers of CRS services as a result of commitments.

Finally, in the case of sale of Marketing and Sales services, the WTO (1998) study notices that while the wording of the Annex restricts the definition of these services to those undertaken by the airline itself…

> And does not cover these activities when carried out by CRS and ERSP [i.e. Electronic Reservation Service Providers] suppliers and travel agents…the Annex definition says nothing about those to whom sales are made. Potentially, therefore, it covers not only direct sales to private or business clients but also block sales of seats to travel agencies and tour operators (notably in the charter market (p. 12).

It estimates that the tickets sold directly by airlines on regular flights is about 20 to 30 percent of all tickets sold and represented in 1995 a figure of up to U.S.$40 billion (twice the size of the MRO market and ten times that of the CRS services), about 16 percent of their operational expenses (figure that includes commissions).

THE ANALYTICAL FRAMEWORK FOR AN AIR TRANSPORT POLICY FOR SMALL STATES

There are two main strands of literature that have a direct bearing on the issues raised in this paper. To start with, airlines are a prime example of network-based business, others include banks, telephone companies, railroads, cable television, sewage system, inland water transport, postal and package delivery, oil and gas pipeline. As such these industries share a

number of characteristics that often lead to market failures and thus have attracted the attention of policymakers and business strategists alike. We will highlight some of the public-policy dilemmas and strategic issues that often attach to these industries as they relate to the airline industry. Next, as is convincingly argued in the ComSec Report and is clearly illustrated by the EU Common Aviation Policy, regional integration can be an effective policy to deal with the challenges of globalisation in the air transportation field. However, trade economists are still arguing whether regional trade agreements (RTAs) are, as Bhagwati (1991) put it, "building blocks" or "stumbling blocks" toward multilateral trade liberalisation. We will review the salient points of this debate.

International Aviation as a Network Industry

Broadly speaking, networks comprise links that connect nodes (Economides, 1996; White, 1999). The route system of a typical airline designed on the hub-and-spoke model is a prime example of a "simple-star-two-way network." This means that all routes go through a central node while any non-central node can be the origin or destination of a trip. As such, route networks of airlines exhibit some special features that are especially relevant to economic policy namely, (positive) technological externalities, and economies of scale/scope, network compatibility and standards. Consider for example an airline with the smallest possible network: one central node C and a single destination A. Here there are only two possible origin-destinations (ODs), namely routes C-A and A-C. However, if we add a second destination, say B, then there potentially four extra ODs to the network: C-B, B-C, A-B, and B-A. Clearly, the addition of an extra destination to an n-dimensional network will create 2n new potential destinations thus enhancing the value of the network accordingly.[17] In other words, the addition of a new route linking a new destination to the hub of an existing airline network will add value not only to the passengers between the two cities directly linked, but to all the travelers of the network. Thus, airline networks are a prime example of what economists call positive technological externalities,[18] whereby "an individual's actions convey uncompensated benefits to others, outside a direct market contact" (White, 1999. p. 14).

Notice that airlines are the kind of network-based businesses for which the value of the network to customers increases not only because there are more users, but also a substantial portion of that value is derived from size of the network per se (Coyne & Dye, 1998). That means that diversity increases the demand for variety and as such adds value to the network. Such externalities are known as consumption or network externalities. In addition, as Economides (1996) points out, the key precondition and main

source for the appearance of this type of externality is the "complementarity" between the pieces of the network. The value of a particular segment of the market increases as more of the other segments are sold. Therefore, there is a positive feedback loop at work here.

Turning our attention to the question of size as such and its effect on production, it is now widely recognised among air transport economists that airlines exhibit significant economies of scale and/or economies of scope and/or economies of density.[19] Broadly speaking, economies of scale exist when the unit cost of production decreases as output increases (Baumol. Panzer & Wellig, 1982). When these economies are confined to particular route or city-pair economists speak of economies of density while if these are a result of adding new product lines or new markets we refer to it as economies of scope. These economies often find their origin in the indivisibility of infrastructures and the presence of excess capacity.[20] The prime policy concern here is whether the entire network or parts thereof generate enough traffic to exhaust any economies of scale that may be present. Otherwise the network may not be able to sustain the presence of more than one efficient carrier, thus leading to what is also known as "natural monopoly."

Furthermore, it is clear that the degree of complementarity, and therefore the efficiency, of networks is enhanced when the links and nodes of different carriers are compatible with each other, namely when they use the same or sufficiently similar technologies and physical apparatus so as to minimise transaction costs. Notice that "compatibility need not be an all-or-nothing phenomenon: close technologies may permit transactions to proceed with some impairment of quality…or at a higher cost." (White, 1999. p. 10). Of course an obvious way to achieve compatibility of networks is to define a commonly agreed set of standards that ensure technological and physical compatibility. The existence of commonly agreed air navigation standards and practices are of paramount importance for the orderly and safe development of the international civil aviation industry. Hence the pivotal role played by ICAO in developing and promoting International Standards and Recommended Practices (known as SARPs) and Procedures for Air Navigation Services (PANS) as Annexes to the Convention on International Civil Aviation.[21]

The key economic policy concern regarding these features is that, in one way or another, they constitute the root-causes of market imperfection inhibiting free competition, thus becoming the justification of government intervention. Given the dubious track record of governments in the effort of restoring competition, the fundamental policy dilemma raised here is whether the potentially negative effects of the resulting monopolies are sufficiently large to warrant enhanced government intervention.

> Accordingly, the presence of market imperfections does not automatically justify government intervention. In the end, the choice between unfettered markets and a continuum of potential government interventions should rest on empirical experience and observation-guided by theory-and cannot be settled by pure theory or ideology alone (White, 1999, p. 14).

For Newbery (1997) though the choice is clear. Regulation of monopolistic (utility) networks has been and still is inherently inefficient. The way to improved efficiency and, eventually, to lower prices is a combination of privatisation and liberalization: "…introducing competition into previously monopolised and regulated network utilities is the key to achieving the full benefits of privatisation. Privatisation is necessary but not sufficient" (p. 358). However, the author cautions that the key problem facing policymakers in their drive towards greater efficiency in network utilities are the form competition to be introduced and the choice of appropriate restructuring.

The form of competition is strongly influenced by technology and initial endowments, and may not be sustainable in every utility, nor in all circumstances. Economists can play a key role in clarifying the determinants of successful liberalisation, and the risk of inappropriate restructuring. Opportunities for restructuring are rare and hard to reverse (p. 358).

Evidently, the airlines of small states have very limited potential for exploiting this kind of network externalities individually. This is because, by definition, their population is small, and therefore their domestic markets are often insignificant and the size of their route networks are very limited.

The presence of (positive) network externalities in conjunction with scale effects has two major implications as far as the airlines of small states are concerned. The direct policy implication of this attribute is that in a free market framework the size of the network will be smaller than what is socially desirable. It is also clear that network externalities also imply that the size of the network is a key factor

In the case of small states, where routes are thinner, networks less dense, and the ability of maintaining adequate technical standards uneven, these market imperfections become even more prominent and pressing. Furthermore the economic policy dilemma identified in the previous paragraph is also exasperated by the limited institutional capacity of these states acting individually. Clearly, if the recommendations of the CSWB Joint Task Force regarding the need for closer regional co-operation and increased bilateral and multilateral assistance were implemented, it would come a long way in alleviating some of these problems.

Commercial Policy: Regionalism vs Multilateralism?

There is an ongoing lively debate among economists on the merits of regionalism versus multilateralism. The key question at the centre of the controversy is whether regional trade integration schemes are "good" or "bad," in the sense of promoting or inhibiting, the multilateral trading system. This question dates back to 1991, with the publication of two papers, by Bhagwati (1991) and by Krugman (1991). These papers sparked rich and burgeoning theoretical and empirical literature reviewed in a recent survey by Winters (1999). He defines regionalism, "loosely as any policy designed to reduce trade barriers between a subset of countries, regardless of whether these countries are actually contiguous or even close to each other" (p. 8); on the other hand, multilateralism, is a behavioural characteristic of a country relating to two aspects: "(1) the degree to which discrimination is absent—perhaps the proportion of trade partners that receives identical treatment; and (2) the extent to which the country's trading regime approximates free trade." (p. 8). Despite the numerous important contributions in this discussion, it would seem that the jury is still out on whether regional trade arrangements are "building blocks" or a "stumbling blocks" toward multilateral trade liberalisation and will remain so for a while yet. In concluding his survey, Winters (1999) notes that "the only categorical statement that can be made…is that one incident of regionalism is not sufficient to undermine a relatively multilateral system immediately" (p. 41).

First we note that although Sapir (1999) concurs with this assessment, he correctly points out that analysts often fail to distinguish between regionalism, as defined above, and regional integration. The latter refers "to a group of countries that wishes to opt for truly deep integration…with dismantled barriers to capital and labour mobility and aiming at common political such as parliament and even uniform foreign policy…," (p. 51) which is considered to have unambiguously positive effects. McMillan (1993) takes a different more pragmatic approach:

> Regardless of what economists think of them, RIAs [regional integration agreements], are here to stay. Regional integration can foster global trade; but it can also impede it. The relevant issue is not whether RIAs are a good thing per se, but how to design international laws that ensure that they are structured so as to avoid harming the global economy…the best test for judging whether a RIA is harmful is the simplest possible: does the agreement result in less trade between member countries and outsider countries? (p. 306).

Furthermore, it should also be noted that the discussion on the merits of the two alternative trade policies has mainly focused on goods trade and that trade services, as such, have remained largely outside the main thrust of this particular debate. Indeed, save some isolated exceptions, the

proliferation of RIA in goods trade in different parts of the world, have not had any counter part in services trade. Up to this point, there is no comprehensive regional trade agreement covering services trade in general between any set countries, except the European Union. In fact, overall services remain still the most heavily regulated economic activity in all parts of the world. Furthermore, even economies that have deregulated large sectors of their domestic services market such as the U.S., the EU, and Canada, governments remain extremely reluctant when it comes to liberalizing trade with others countries. This incredulous attitude can, in great part, be explained by the special nature of services trade, discussed earlier, but also because negotiations involving services tend to be notoriously complex, often involving complicated technical elements, exacerbated by the lack of adequate historical statistical data and reliable background information.

The paucity of RIA in services trade notwithstanding, the international civil aviation industry offers a number of remarkable exceptions. In particular, the successful operation, for several years now, of supra-national regional airlines such as SAS but also Air Afrique, Air Maghreb, Air Mano (Abeyratne, 1998), and the recent emergence of several, so-called, "mega carriers," would seem to suggest that the potential economic benefits of greater integration could outweigh the difficulties discussed above. Reaping the benefits of international cooperation in the field of civil aviation is also the main driving force behind the emergence and growth of organizations such as ICAO and IATA.

CHALLENGES FACING THE AIRLINES OF SMALL STATES

Small states face several challenges which are either idiosyncratic to these states or although encountered in many developed markets take on a special significance in the context of these states.

Air Transport and Tourism

The fact that many small states are often geographically remote and isolated from major markets, especially in Africa and the Pacific, has significant economic and administrative implications. In particular, long routes coupled with "thin" markets due to limited domestic markets impose high transportation costs on most of these countries. These conditions imply that service providers are usually (natural) monopolies and "as a result, the economies of small states do not benefit from the effects of competition on improving efficiency, lowering costs, and spurring innovation" (Abeyratne 1999, p. 7).

In addition, most small states rely heavily on tourism as the main source of foreign currency. Indeed, in Table 3, of the CSWB Report (ComSec, 2000, p. 11) it is pointed out that in 1997 the share of tourism in export of goods and services in the Pacific, ranged from 7.3 percent (Marshall Islands) to 50.6 percent (Samoa). The situation is more dramatic in the Caribbean (Table 4, p. 11) where the share of tourism in exports of goods and services for the same year varied from 43.7 percent (St. Vincent) to 75.6 percent (St. Lucia).

The heavy reliance of the economies of small states on tourism has considerable developmental and environmental implications. In particular, as this was pointed out in our earlier discussion on the services trade debate, the export of services often implies import growth. This is especially true in the case of tourism development in small states where tourism expansion is accompanied by significant increases in non-indigenous food imports and inputs to construction of tourism-related infrastructure. In addition, linkages and spill-overs to the rest of the domestic economy are generally thought to be limited, as many types of tourism facilities are in effect "enclave developments" (ComSec, 2000, p. 11–12).

Nonetheless, the "symbiosis" of aviation and tourism has correctly been identify as the driving force behind the phenomenal growth of tourism as the "world's largest industry" (Abeyratne, 1999, p. 63). Clearly, air transport plays an especially pivotal role in promoting the tourist industry of small states, especially in the case of SIDS. The fact that most of the airlines of small states are also "flag carriers" means that air transport has had a significant overall strategic economic importance for the development of these states. However, considering the drive towards multilateral liberalization of the air transport industry described earlier, "…it would not be unrealistic to expect that air carriers of the future would operate air services to tourism-based countries on the dictates of unpredictable and rapidly changing market forces rather than on sustained public services considerations" (p. 63).

Furthermore, given the well-established causal link between variations in National Income and demand for air transport, the high income volatility that characterises these states, coupled with the openness of these economies, places carriers in a very precarious financial position. In addition, the susceptibility of small states to natural disasters and environmental changes, their limited access to external private capital and financial resources, and their reduced institution capacity—especially in the provision of public goods and services (such as airports and ground facilities)—could transform mere challenges facing their airlines into major stumbling blocks in their overall economic development. Finally, while it is true that most of these problems are not small-state-specific, in

the case of these states they often appear simultaneously, thus having a cumulative detrimental effect on their economies.

Environment Effects and Airport Congestion

Another serious challenge facing the airlines of many developing nations, directly related to the earlier point is the environmental impact of air transportation activity on the economies of many small developing states.[22] Indeed these economies are often confronted with a difficult dilemma between, on the one hand, maintaining a healthy level of socio-economic development—to large extent dependent on the hospitality industry (and in particular travel and tourism), and environmental protection on the other.

> The pivotal consideration in sustainable development is that it has economic, social and environmental dimensions. Therefore, in considering the extent of control that needs to be exercised by SIDS [small island developing states] in the areas of tourism and air transport development in order that a balance be maintained between progress and sustainable development, all three factors have to be carefully addressed" (Abeyratne, 1999, pp. 64–5).

In fact, the thrust of the Report of the 1992 United Nations Conference on Environment and Development (especially Agenda 21), "was that environmental issues were the necessary corollaries to social process and should be addressed on the basis of equity, care for nature and natural resources and development of society. Environmental management is therefore to effective sustainable development" (p. 58). Clearly, the geography and geomorphology of these countries imposes sever limitation and binding constrains on their ability to achieve the necessary level of sustainable development.

Quality of Service and Fleet Renewal

Recent evidence suggests that the quality of service offered by airlines is to a large degree determined by the average age of the fleet (Abeyratne, 1998; Headley & Bowen, 1997). Indeed surveys confirm that flight punctuality, in-flight service, superiority of aircraft, cabin and seating configurations, and number of accidents regularly top the list of factors influencing customer satisfaction. Clearly all these elements are directly related to the quality of the fleet in general and the age of the fleet in particular.[23] It is also generally recognised that the fleets of the airlines of small (developing) nations are in dire need for major overhaul and that these countries face increasing difficulties in securing sufficient funding to undertake this onerous tasks.

Market Access (Barriers to Entry, Slot Allocation and Airport Competition)

Several studies, in the U.S. and elsewhere,[24] have documented that while deregulation has had an overall positive effect on consumers in the respective economies, several important impediments to market access remain, especially for new entrants. In many instances incumbent carriers use existing exclusive gate use leases in major U.S. and European hubs, the so called "grandfather rights," as barriers to entry, which result in heavily skewed allocation of landing rights, or slots, in their favour. Analysts and policymakers are concerned that these so-called "operating barriers" coupled with other marketing strategies, such as code-sharing agreements, booking incentives for travel agents, proprietary CRS and frequent flier plans strengthen the incumbents' positions thus thwarting entry and significantly limiting competition. "As a result, competition suffers, leading to higher airfares. The effect of these strategies tends to be the greatest—and the fares highest—in markets where the dominant carrier's position is protected by operating barriers" (GAO, 1996, p. 2).

In the case of small state airlines, the market access problem to large U.S. and European markets is exacerbated by the relatively small size of the home market which severely hampers their ability to effectively overcome these operating barriers. Furthermore, while airports in OECD countries are increasingly moving towards greater inter-airport competition, promoting profit-maximising objectives, thus offering incentives for more efficient allocation of take-off and landing rights, small state airports are facing a double handicap. In most cases, state ownership of airports coupled with strong vertical relationships between airports and airlines means that some form of regulatory control is inevitable (DECD, 1998, p. 8). In these cases, the OECD recommends, as a second best solution, that the regulatory arrangement and slot allocation should be based on the market process in both the primary and secondary markets, subject to competition law. The problem is that airport administrations in small states are not always able to perform the administrative allocation effectively. This is because often there are no primary and/or secondary markets for slots, meaning that the opportunity cost of slots is zero. This results in further "hoarding" and the socially inefficient allocation of landing slots.

Labour Productivity and Outsourcing

Greater competition at the global level has forced airlines to make a sustained effort to control costs, improve efficiency and hopefully increase profitability. Studies confirm that labour costs still represent a major component of the operating costs of international airlines and that their drive towards deregulation has forced companies to reduce labour costs and

increase productivity (Alamdari, 1998; Antoniou, 1992). One of the most popular strategies adopted by airlines in order to contain labour costs is by outsourcing some of their in-house functions (Rutner & Brown, 1999, p. 23). This reduces their fixed costs relative to their variable costs thus reducing the breakeven level of output. Evidence suggests that the functions more likely to be outsourced by airlines include ticket sales and distribution, aircraft leasing, airport gates, complementary limousine pick-up, food services, ticketing, baggage handlers, aircraft interior cleaning, engine overhaul or rework, maintenance training, information systems and technology, pilot training and advertising.

It is clear that small state airlines have a limited ability to outsource most, of even some, of these services. This is because small states, and especially islands, are typically geographically isolated thus making the entire effort pointless. Furthermore, even when surrounded by other states, outsourcing to suppliers of services in neighbouring countries will not necessarily have the desired effect, as costs do not vary significantly on a sub-regional basis. Nevertheless, considering that there may significant economies of scale in the provision of these auxiliary services, we can not exclude the potential that there may be non-negligible benefits to be reaped from the joint production and distribution of these services, provided that countries are sufficiently physically close to each other.

Other Impediments

In a discussion of challenges and opportunities facing Asian airlines, Oum (Findlay, Sein, Singh, 1997) identifies several impediments that these airlines must face in order to effectively implement market liberalization. Some of these impediments are also applicable to small state airlines including, (a) the tendency to "self protectionism" due to restrictive bilaterals, coupled with small-network-single-hub structures; (b) the weak consumer influence exacerbated by the fear of competition; (c) the great variations in the political systems of these countries, associated with the cross-culture communication difficulties between them; and (d) the competition between the military and civilian use of their airports.

On the broader issue of the liberalization in international aviation Trethaway (Findlay et al., 1997) believes that the greatest remaining impediment is the system of bilateral agreements which, he argues, is both expensive to administer and inefficient. He believes that as a result of bilateralism, countries expect to share equally the benefits of freer trade thus forego mutually beneficial, therefore efficient, trade expanding agreements.

ALTERNATIVE POLICY OPTIONS AND RECOMMENDATIONS

There is no magic formula to overcome the numerous and often insuperable problems facing the airlines of small states. Furthermore, almost every state has its own idiosyncrasies thus making it almost impossible to produce a ready-made set of remedies that can be applied to all cases. Nevertheless, the institutional framework outlined in the second section and the economic characteristics of the international airline industry identified in the next section point towards two broad policy options available to small states in order to meet the challenges facing their airlines. These are the integration of their air transport services at a regional levels and the liberalization of their air transport markets in a way that will allow their airlines greater operational flexibility to meet the challenges of enhanced global competition. Clearly, these are not any different from the options open to the airlines operating in other states. However, given the vulnerability of small states to outside shocks, these states need to be especially careful in formulating an appropriate set of strategies better suited to their own particular needs.

Several alternative strategies have been suggested that will enhance the ability of African, Asian, or indeed any other developing country's, airlines to survive in a more competitive global market. However, all these strategies share a common, often undeclared, underlining objective: to define the appropriate policy environment that will ease the transition to a more liberal and regionally integrated airline market. The key element of this approach is the gradual liberalisation of national airline markets over a relatively protracted transition period, while at the same time setting-up the foundations for greater cooperation and eventual integration at the regional level.

At the global intergovernmental level, ICAO recommends to its members that the airlines of states that "are at a competitive disadvantage when faced with the mega trends of commercial aviation and market access" should be granted the following preferential measures (Abeyratne, 1998):

1. The asymmetric liberalization of market access in bilaterals with developed countries;
2. More flexibility for air carriers in changing capacity between routes in bilaterals;
3. Trial periods for liberal arrangements for limited periods of time;
4. Gradual introduction of more liberal market access for longer periods;
5. Use of liberalised arrangements;

6. Waiver of nationality requirements for ownership of carriers;
7. Allowance for more liberal leasing agreements for modern carriers;
8. Preferential treatment in slot allocation at airports; and
9. More liberal agreements for ground handling at airports, conversion of currency at their oversees offices and employment of foreign personnel with scarce skills.

Other preferential measures could include:

1. Long term low interest loans for the purchase of modern carriers;
2. Temporary exception from emission standards;
3. Collective use of air traffic rights through combined operations; and
4. Release from obligation to own and control their own airlines.

At the more regional level, Oum (in Findlay et al., 1997) suggests a number of short and long term initiatives to mitigate the impediments facing some if these airlines. His short-term recommendations include:

1. Open charter and freight markets between countries in the region;
2. Relax code-sharing rules between regional carriers;
3. Liberalize third and fourth freedom rights;
4. Relax rules on foreign ownership; and
5. Expand bilateral and multilateral agreements with "like-minded" neighboring countries.

In the longer term, Oum also recommends:

1. Intra-regional open sky agreements;
2. Expanded bilateral and multilateral agreements outside the region; and
3. The development of multilateral general trade agreement.

Forsyth (in Findlay et al., 1997) has looked at the issue of privatization of airlines with reference to the Pacific Asian region and has come to a number of extremely interesting conclusions. In particular he found that, to a certain degree, the privatization of carriers is incompatible with the liberalization of markets. Indeed he observed that during the period leading to and following privatization, governments are unlikely to embark on any major liberalization campaign that could put to jeopardy the profitability

and thus the chances of success of privatization. To the contrary, governments tend to increase protection immediately prior and after privatization for this very reason. In addition, the author argues that governments continue to attach great political significance to ownership of their carrier seen as "flag carriers" to serve the public interest. Of particular concern to governments is the likelihood that the ownership of the national carrier could fall in foreign hands. Furthermore, he also found a very strong positive correlation between per capita income of the country and privatization of airlines and that the majority of privatized airlines were large successful companies.

Finally, inspired by the Treaty of Rome, Trethaway (in Findlay et al., 1997) recommends that the remaining, air transport services i.e. those not already included in the GATS, should be included in a broader regional trade liberalization negotiation as part of the wider package of goods and services. Furthermore the author also suggests that countries interested in liberalizing their markets should endeavor to document consumer gains from open-air transport markets, especially for down-stream industries such as tourism and high tech. A good starting point is air cargo where potential gains are bound to be large, especially for the rest of the economy, with almost no "flag-carrier" effects. Lastly, Treatheway is also in favor of starting the liberalization drive by developing sub-regional agreements of "like-minded" nations.

CONCLUSIONS

In this paper we set out to investigate the policy options open to small states in their quest to modernize and restructure their air transport industries in the context of the new world trade order. We presented the main features of the international air transport industry, discussed the salient points of the analytical debate surrounding the efforts to liberalize the world aviation industry and analyzed the challenges facing the airlines of small states. We were then able to propose a number of alternative policy measures that could constitute the basic elements of air transport policy aiming at defining the appropriate environment that will ease the gradual transition to a more flexible, more efficient, and regionally integrate airline market.

ENDNOTES

1. For the purposes of this study "small states" refers to independent and sovereign developing nations, which excludes former colonial overseas terrirtories such as Montserrat and Anguilla, but also countries like Leichtenstein or Faroa.

2. An important ingredient of any policy is the availability of adequate International Air Transport data and statistics collection, a point convincingly made by Button (1999).

3. This is the actual title of the actual Report published by the Commonwealth Secretariat/World Bank Joint Task Force on Small States (2000).

4. "… One's bargaining power is greater the more one has to offer that the other party wants (via reciprocal bargaining) and, conversely, the more the other party would be harmed if one withheld what one has (in retaliation for violation of the agreement." (McMillan, 1989, p. 38).

5. It was to mitigate this particular bargaining handicap vis-à-vis that the EU adopted its own common air transport policy, see later.

6. See Toh (1998), pp. 66–7.

7. It is interesting to note that, ironically, the encirclement strategy also gave these alternative destinations some potential strategic leverage over the US., as suggested by McMillan, although there is no evidence that these countries used this (unexpected) bargaining power.

8. See Antoniou (1998).

9. Implicitly acknowledging this inconsistency in U.S. policy, Toh (1998) concludes: "But the *ultimate* goal [italics added] of international Open Skies is the mutual granting the rights of cabotage, allowing foreign airlines to operate flights serving domestic city pairs." (p. 69).

10. Weisman (1990) offers a good discussion on the economic issues surrounding services trade and their application to international aviation.

11. For a full discussion on the economics of the trade in services see Sapir and Winter (1994).

12. Recall that the MFN is a basic GATT principle, Article I, whereby members are bound not to discriminate in their trade policy and to provide to all trading partners the same customs tariff treatment given to the so-called 'most-favored-nation'.

13. "The problem has centred around two topics: the most-favoured-nation (MFN) principle and labour mobility. In both instances, the problem relates to a major ambition of the industrial nations in the services negotiations, namely to obtain not only improved trade access but also rights of establishment for their services companies in the developing countries. These countries have been reluctant to commit themselves to granting such rights in politically sensitive infrastructure activities. As a result, some industrial countries have sought to deny the application of the MFN principle from the services agreement." (Supir & Winter, 1994, p. 296)

14. In particular, this coverage can be found in paragraphs 2 and 3 of the Annex on Air Transport Services. Note also that Article III and V of the GATT also cover air transport. For details see WTO (1998) and that the Annex is due for review in September 2000.

15. According to some estimates these costs can represent two-thirds of the sale price of an aircraft (Airbus 300–600) over a 15-year period and that if airlines could reduce maintenance time (and thus raise rate of use) by one hour per day, this could increase the turnover per aircraft of between US$ 10 and 12 million per year (WTO, 1998, p. 4).

16. Alternative patterns are also considered in the study, see WTO (1998), pp. 5–10 for details.

17. Provided that the system in general and the central node in particular has enough capacity to accommodate the extra traffic without imposing congestion costs on incumbent users.

18. Namely, "These are different from pecuniary externalities that are price-related and are transmitted through the market mechanism.

19. In fact this has not always been the case. For many years the prevailing wisdom was that airlines are characterized by the absence of any scale effects, see Antoniou (1991) for a review of the relevant more recent (empirical) literature.

20. On a more technical economic level, Antoniou (1998) argues that indivisibilities could in fact be one of the reasons why this industry may not have equilibrium so that its core may be empty.

21. See the ICAO (1994).

22. See Abeyratne (1999) for the a discussion of this problem in the special case on small island developing states, and *idem* (2000) for the consequences of slot transactions on airport congestion and environmental protection, with special reference to the ICAO Airport Planning Manual.

23. In fact, Antoniou (1992) identified age of the fleet as one of the factors the determines the profitability of international airlines Furthermore it is also true that the aircraft noise level is directly related to the age of the flight, see Abeyratne (1998).

24. See in particular, GAO (1996,1998), NRC (1999), DOT (1999), Abeyratne (2000), OECD (1998).

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