



**PROTECTIONIST HIGH-FLYERS:
SPECIAL INTEREST POLITICS IN THE AIRLINE
INDUSTRY OF THE EUROPEAN UNION**

Diplomarbeit

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Abbreviations

ACI EUROPE	Airports Council International EUROPE
AEA	Association of European Airlines
DOT	U.S. Department of Transportation
ECJ	European Court of Justice
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
LR	Likelihood Ratio
ML	Maximum Likelihood
NTB	Non-Tariff Barrier
OECD	Organization for Economic Cooperation and Development
OLOGIT	Ordered Logit
OLS	Ordinary Least Squares
PAC	Political Action Committee
STAR	Summary of Traffic and Airline Results
VIF	Variance Inflation Factor
WTO	World Trade Organization

1. Introduction

“We hear a good deal about what the Europeans like to call ‘airline liberalization’, we think the real result is likely to be more along the lines of “Fortress Europe”, as the European carriers consolidate their already dominant positions and band together to limit participation by U.S. carriers.”

(Robert Crandall, Chairman of American Airlines 1991)¹

Previously regulated state-owned network and service sectors such as transport, energy and telecommunications have been subject to deregulation within the European Union throughout the 1990s. Paces of market liberalization vary across sectors and countries, and so does the gap between the *de jure* and the *de facto* status of deregulation.

My central argument is that the emergence of this gap is due to lobbying activities of firms seeking economic protection from their national governments in formally liberalized markets to sustain their dominant position.

This argument will be analyzed on the basis of the European passenger air transport industry. The regulatory environment prior to liberalization in 1993 provided national flag carriers² of the EU Member States with monopoly power, leading to inefficiencies and overall welfare losses in terms of service diversity and fares. Since 1993, control over market entry and state aid is legally prohibited and closely monitored by the European Commission to foster competition in line with the European common market. National airlines face increased potential competition from new and profitable rival airlines. The expected reaction is increasing lobbying activities by flag carriers for economic protection to sustain their dominant market positions. Their political influence is thereby a function of lobbying activities, leading to the main hypothesis: *the more political influence an airline has, the more protectionist policies will be implemented for its benefit by the national government.*

Since legal control over market entry is prohibited, the means of achieving a certain level of protection for flag carriers have changed and are not easy to identify. While

¹ Remarks at Duke University, North Carolina, 28 March 1991 (in Dobson 1995: 194).

² National airlines such as Air France, British Airways, Lufthansa etc.

airline subsidies are still granted, they are often disguised as private investments from state-owned companies to airlines. Such state aid measures are monitored and documented by the European Commission (Report on Competition Policy, several volumes). The documents give on the one hand a good insight into the extent of public financial investments past 1993, but reveal on the other hand the lack of stringent and formal reasoning in applying competition rules to the airline industry. Especially in times of crisis such as the past September 11th period when airlines have suffered heavy losses, governments can easily justify financial intervention. Additionally, many European airport systems are still government-owned. Airports constitute complementary infrastructure for operating airlines. Governments controlling the national airports have capabilities to supply their flag carriers at airports with cost advantages from lower landing or ground-handling fees.

Most large European hub airports are capacity constraint, i.e. demand for take off and landing *slots*³ exceeds supply at peak times. The disproportionate allocation of slots at major airports is identified as an indirect control over entry. European flag carriers hold on average more than 50 percent of the total slots available at their home hubs. This hub dominance only leaves little room for new competitors and is largely seen as an obstacle to free airline markets.

These factors account for the protection level of the individual airline industries of the EU Member States and Switzerland. They are assumed to be a function of an airline's political influence.

To measure lobbying activities poses a problem resulting from their informal nature. The model is therefore based on the structure-performance approach of industrial organization. I link market structure variables (e.g. *market concentration*) and firm-specific factors (e.g. *state ownership*) to protectionist policy outcomes. A protectionist index is constructed as dependent variable, including *hub dominance* and *state aid* as main indicators. The relationships between influence factors and protection index are tested by means of an ordered logit regression model. The results suggest that especially

³ A slot is the scheduled time of arrival or departure for allocation on a specific date at capacity constraint airports (IATA 2002: 11).

the market concentration ratio and the level of state ownership positively affect protection in the European airline industry.

I conclude that state-owned airlines and carriers stemming from previously densely concentrated markets are sufficiently influential to further receive protection from domestic and intra-European competition. State ownership seems to be especially a serious obstacle to liberal airline markets when governments hold a majority share of more than 50 percent in their national airline.

The analysis is limited by a small sample size of 16 observations and by heterogeneity of the data. Missing data for corporate political activity in the European Union leads to the indirect measurement of influence through economic and firm specific structure variables. Hub dominance of national airlines has not been quantified to this extent before and data is not easily accessible.

Nevertheless, this thesis bridges a gap between econometric analyses of deregulations' welfare consequences and political scientists' narratives about its emergence. It illustrates that governments can de facto protect airlines in a deregulated market if they wish to do so because the European Commission lacks the necessary information and authority to prevent competition distorting behavior of Member States.

The following chapters aim to provide background information about common aviation policies within the European Union, followed by a review of previous research in industrial organization and deregulation theories. On the basis of this literature I then model the theoretical framework, which is tested quantitatively by means of an ordered logit regression. Before concluding, I illustrate the statistical results and their empirical relevance.

2. EU Aviation Policy

Air transport has for long been excluded from EC Treaty Law. Article 84(2) of the EC Treaty provides that “*The Council may, acting unanimously, decide whether, to what extent, and by what procedure, appropriate provisions may be laid down for sea and air transport*” (O’Reilly and Stone Sweet 1998: 166). Encouraged by early US deregulation movements of the airline industry, the implementation of the Single European Act in 1987 and in response to several legal rulings by the European Court of Justice (ECJ), Member States began to develop a common aviation policy in the late 1980s.⁴

The 1986 *Nouvelle Frontières* case was thereby a cornerstone for the application of competition rules to the sector. Responding to the market-distorting criminal proceedings of French private airlines and travel agencies, the ECJ judged that these practices were incompatible with Article 85 of the EC treaty – containing the general principles of competition law – and that Article 84(2) of the Treaty is not an objection to the application of Article 85 EC Treaty (O’Reilly and Stone Sweet 1998: 174).

Subsequently, three “Liberalization Packages” have been adopted. The “First Package” contained that EU competition rules should directly apply to aviation with exemptions concerning planning of capacity, revenue sharing, consultation on tariffs, computer reservation systems and ground handling services. Members were encouraged to keep fares at a reasonable level related to costs. This first package insufficiently fulfilled single market conditions and therefore the “Second Package” was adopted in 1989. Some measures of the “First Package” have been reinforced, non-discriminatory measures have been added, and most importantly, rules on ownership were reformed, allowing for cross-border ownership (Button 1996).

This opened up possibilities to finally introduce the fifth freedom right, i.e. “*...the right to pick up passengers and cargo in another country and carry them to destinations*”

⁴ The history of EU aviation policy as such is not the subject of this thesis, but it provides a better understanding for the subsequent analysis.

other than the airline's country of origin."⁵ In 1993 the "Third Package" has been adopted, guaranteeing sixth- and seventh freedom rights.

The sixth freedom is "...*the right to pick up passengers and cargo in one state, bring them to the airline's country of origin and transfer them to flights for foreign destinations.*"

The seventh freedom contains "...*the right to carry passengers and cargo between two states, neither of which is the airline's country of origin.*" (Dobson 1995:1). The year 1993 is therefore the first important milestone of European airline deregulation.

In 1997, the eighth freedom right – also known as *cabotage* – has finally been implemented within the Member States. This operating right allows an airline to carry passengers and cargo between two points within a state, other than its country of origin.

Why has deregulation in Europe been such a difficult procedure, especially compared to the US market? Member States refused to give up sovereignty over their airspace and feared competition for their national symbol – the flag carriers. European officials faced the difficult dilemma to simultaneously encourage competition and economic efficiency, to reduce externalities caused by the industry and to guarantee air transport safety. Terming this process *liberalization* falls short of the complexity involved: it has been – and still is – a mix of deregulation on Member State level and re-regulation by EU institutions.

While promoting fair competition within the Member States, the European Commission is in a powerful position to protect the European market from third country carriers: since 2002 the Commission is the sole negotiator for all international bilateral "Open Skies" agreements (Commission 2002a).

⁵ Regulatory rules of international aviation base on eight operation rights, adopted at the International Aviation Conference in Chicago 1944. For a listing of these rights see Appendix B.

3. Previous Research

Literature on liberalization of service sectors or network industries is rare in a sense that it only captures explanations of deregulation *processes or consequences* instead of its political *emergence and obstacles*. To fill this gap I build on sector specific reform and deregulation literature complemented by elements of industrial organization and rent seeking to theorize about the political influence of airlines on protectionist policies.

3.1. The Aviation Sector: De-regulation or Re-regulation?

Most of the descriptive studies focus on the question why this sector resisted reform for such a long time, especially in comparison to the US market, where deregulation started already in the 1970s. In presenting the Aviation Act of 1975 to Congress, President Ford stated that the US aviation sector had outgrown the need for protective regulation since *“the rigidly controlled regulatory structure now serves to stifle competition, increase cost to travelers, makes the industry less efficient than it could be and denies large segments of the American public access to lower cost air transportation.”* (Ford in Brown 1987: 2). Deregulation of the American market has long been completed in contrast to European aviation.

3.1.1. Economic Consequences

Doganis (2001) offers an overview of aviation market structures and conditions worldwide. He illustrates competition and technical issues as well as the nature of bilateral “Open Skies” agreements and the phenomenon of newly established, low-cost carriers in Europe. His study lacks an analytical framework, but offers valuable insights into airline economics in general and strategies for airlines facing the new conditions in particular, while Dobson (1995) focuses especially on deregulation processes in the US and in Europe – including political considerations.

The most fruitful contribution to these narratives is the EU–US comparison by Kenneth J. Button (1996). By comparing central characteristics of the liberalized US market with the regulated European market at the end of the 1980s, he identifies several economic consequences of regulation. One of them is a severe production efficiency differential,

meaning that European scheduled carriers employ their labor less efficiently. British Airways – already the most profitable European airline by the end of the 1980s – is for instance only 65 percent as productive as major US airlines (Button 1996: 74). The question, then, arises: what are the costs of these inefficiencies in Europe?

Using econometric analysis, Good et al. (1993: 1039) show that European airlines' relative cost disadvantages are caused by higher factor prices and uncontrollable costs such as landing fees on the one hand, and subsidies from governments leading to lower productivity and over-capacities on the other. By comparing efficiencies, Good et al. (1993: 1036) obtain a measure of the potential benefits from deregulation due to changes in costs and presume that a more competitive market is likely to eliminate inefficient carriers, or increase their efficiency over time.

Although granting direct subsidies to airlines was not a common practice in the United States, Button (1996: 78) infers that EU policy makers have obviously not learned their lessons from the few existing cases, which caused over-capacities and distorted competition within the US market. The large amounts of subsidies granted to airlines give reason to believe that there is distorted competition within the EU. He further identifies hub dominance in Europe as an obstacle to competition, which causes flag carriers to exploit their market position. It is the combination of control over airports and “...governments' rearguard actions to protect their carriers...” (Button 1996: 76), which partly explains the monopoly power of European operators over main hubs, domestic, and intra-community routes.

Especially the fact that European carriers dominate their domestic markets gives rise to suspicion that national governments protect their carriers from international *and* domestic competition. In 1993, the majority of European carriers served 70 to 100 percent of total domestic routes, leaving no room for new rivals. On the basis of his comparisons, Button (1996: 79) concludes that “...*incumbent airlines naturally seek to manipulate whichever type of regulatory regime confronts them.*” Due to the narrative comparison this conclusion is based on, it is rather a speculative inference. It goes in line with many descriptive studies about the protectionist nature of European flag carriers. Obstacles to competition and contestability are incidentally illustrated, but

political processes causing protectionist behavior are neglected (e.g. Lyle 1995, Barret 1997, Staniland 1997).

A series of econometric analysis offers sound proof of market and route structure impact on fare levels. Unfortunately, they are mainly limited to the US market, and again, they focus on economic consequences of protectionist behavior, i.e. welfare losses of protected markets. Using a large database⁶, Borenstein (1989) finds that route dominance by one or two carriers results in higher fares for consumers. Route dominance is caused by hub dominance simply because potential rival airlines have no chance to enter that route if no slots are available at origin and destination airports.

By analyzing specific routes before and after their liberalization on the US market, Graham et al. (1983) confirm that competition from new rival airlines affects fares negatively. But at the same time fares are positively related to market concentration. A reduction of overall market fares (instead of route-specific prices) can therefore only succeed if new competition has the magnitude to lower concentration. This leads them to the conclusion that potential competition within their sample in the early 1980s is not strong enough to reduce prices in concentrated markets (Graham et al. 1983: 137).

Marín (1995) conducts a similar analysis for intra-European routes, comparing prices before and after their bilateral liberalization, concluding that bilateral liberalization positively affects competition and entry at these routes respectively, but without significant effect on overall market prices. Incumbency advantages of flag carriers derived from the control of airport facilities further supplies these carriers with high market shares. It must be noted that liberalization of the considered routes was taken independently of EU rules by countries that are less regulatory oriented. Therefore, this analysis does not give insights on how EU ruling affects competition and prices.

3.1.2. Political Processes

A further strand of literature focuses on EU aviation policies, but therefore without quantifying the consequences of liberalization and deregulation. Travis (2001) builds on the neo-functional theory to explain Member States' changing preferences on this

⁶ The "Origin and Destination Survey" from the US Department of Transportation (DOT).

topic. In a process-tracing manner he uses game theory applications to identify bargaining outcomes among EU institutions and national governments. The leading role in the liberalization process is attributed to the British government by exploiting ECJ rulings, forcing other Members to transfer aviation competencies to the Commission as a supranational institution. Resistant governments were finally forced to agree with the implementation of the Single European Act in 1987 since they had to fear legal consequences from infringements of competition law.

While Travis' analysis focuses on liberalization, Dolores O'Reilly and Alec Stone Sweet (1997) emphasize that the market has rather been re-regulated on the EU level, instead of simply liberalized by Member States, but the research question remains the same: why have reluctant governments transferred aviation policy competences from national to supranational authorities? Of special importance are societal actors' interests in combination with the integrative position of the Commission:

"In the eyes of European traders, passengers, and private airlines, the national regulation of air transport was a failure. Flagship carriers were slow or unable to adjust to the changing needs of business, who needed an efficient air transport system to develop and exploit the new European market." (O'Reilly and Stone Sweet 1997: 170).

The Commission – empowered by ECJ's ruling in the *Nouvelles Frontières* case – enforced its position to deregulate the sector and the alliance of societal groups with the Commission finally accounted for the success.

The deregulation process is most certainly predestined to illustrate neo-functional mechanisms, since at a first sight it seems that the European Commission is in fact the winner of the deregulation game. And considering the extreme bargaining positions of supranational and national actors in the beginning, it seems even more astonishing that, *"In sum, governments, faced with declining benefits and rising costs of maintaining national governance structures, reacted by constructing supranational governance"* (O'Reilly and Stone Sweet 1997: 184). While this is *formally* correct, I argue that governments will *de facto* find other means to protect their carriers in the new environment.

While the former strand of literature cited so far is concerned with economic consequences of deregulation, the latter focuses on the political process behind it, but neither reveals political processes of remaining obstacles in the deregulated market. Therefore, one question remains: how do national airlines manage to stay on top within the EU common aviation policy past 1993? I now move on to approaches highlighting the remaining need to reform.

3.2. Obstacles to Reform

A second broad strand of analysis moves away from the deregulation process towards remaining reform-potential in the deregulated environment. Knieps (1996) emphasizes the network character of air transport. Three levels need to be interconnected: airlines, airports, and air control systems. While deregulation is formally completed for the airlines, the interconnectivity of the levels is problematic and needs to be reformed. Hub airlines – mostly flag carriers – take advantage of economies of scope at large hub airports where transfer passengers are bundled. Fusions of hub carriers or code share agreements even magnify economies of scope.

From a competition policy perspective this is not problematic as long as capacities exist at parallel hubs for potential competitors, i.e. the market is contestable with symmetrical access for active and potential airlines at airports (Knieps 1996: 82).⁷ One obstacle to contestability at airports are grandfather rights. Airlines inherit slots from the previous travel season if they have used them to an 80 percent minimum. Since flag carriers have always been in a dominant position at their home hubs, their privileged position is historically given and magnified by merging with other flag carriers since no slots remain for potential competitors at capacity constraint airports.

Gischer (1996) confirms that airport dominance of flag carriers is a relevant barrier to entry caused by the outdated grandfather rights. Notwithstanding their anti-competitive character, reform has been ignored within the deregulation process. Most scholars agree that grandfather rights need to be disposed, and while proposals for new slot allocation mechanisms vary, all of them aim to improve the distribution of scarce slots by

⁷ For detailed analysis of conditions of contestability and a definition of hub and spoke networks see chapter 4.2.5.

introducing scarcity value into pricing. That is a demand and supply rationale, leading to high prices for slots when scarcity at peak times is given (e.g. Ewers 2001; Gischer 1996; Starkie 1998).

Ewers (2001) develops comprehensive recommendations for a reformed slot allocation procedure. Scarcity surcharges at airports can be reinvested into the expansion of airport capacity. Validity of slots should expire after a set period of time and thereafter return into the slot pool for auctions. With the introduction of trading mechanisms airlines could acquire slots before they fall back to the pool, which would increase flexibility to react on market conditions.

According to Ewers (2001: 4), every participating actor would benefit from this. Airports increase their productivity and consumers profit from more competition and lower fares. New business opportunities emerge for airlines within the EU since accessibility of airports increases with abolishing grandfather rights. Flag carriers suffer losses in the short term, but according to Ewers (2001: 4) “...*incumbent airlines will profit from the new opportunities of competition at all EU airports*” in the long run.

State aid is also identified as an ongoing obstacle to reform in the deregulated market. These scholarly pieces are either case study oriented or law articles. John Balfour (1995; 1996) wonders if state aid to airlines is a question of law or politics. He investigates individual subsidy cases brought before the ECJ and assesses if decisions taken by the Court and the Commission are in line with Treaty law and if it affects state aid behavior. He finds that although no Treaty provision prohibits state ownership of airlines itself, the application of Treaty rules to the airlines will indeed limit the amount of financial transfers. But Balfour (1996: 168) also highlights political obstacles to the stringent application of Treaty law to the sector:

“...because the prestige attaching to national airlines is somewhat more noticeable and significant than in other industries, and also because of the large number of people employed in the industry and the social consequences of staff reductions, serious political forces stand in the way of proper application of the rules, as the experience to date demonstrates only too well.”

The approaches reviewed so far consider economic consequences of deregulating air transport in the EU, its political emergence as well as remaining obstacles to competition. Next, I highlight a few approaches assessing the political influence on obstacles to deregulation in general before developing a theoretical framework on the basis of this literature.

3.3. Political Influence

This part focuses on a series of analyses hypothesizing a relationship between industry structures and its political activity and success. I will cite and discuss the most important work, which will also supply the theoretical underpinning for the estimated political influence of European airlines within my model. Common feature of all studies is an expected relationship between industry concentration and either political activity in the form of political action committee (PAC) contributions to legislators, or direct policy outcomes in the form of protection. But heavy dispute exists about the direction of the expected relationship: does political activity increase or decrease with industry concentration?

The basis for the relationship forms Mancur Olson's (1965) Theory of Collective Action. In concentrated industries, a few firms account for the entire output. The larger the firms, holding industry size constant, the lower are free-riding incentives for individual firms and information costs. Therefore, returns on employed lobbying resources increase with market concentration for each firm respectively. To put it simply: lobbying efficiency increases with industry concentration. Consequential, the likelihood of industry-preferred policy outcomes will increase simultaneously (e.g. Andres 1985; Esty and Caves 1983; Hansen and Mitchell 2000; Grier et al. 1994).

Salamon and Siegfried (1977: 1032) additionally stress that firms in concentrated industries yield higher profits, which are extracted from their market power before reinvested into political activity. Firms do not only face lower costs in directing their common interests towards legislators, but also have relatively more resources to do so. Salamon and Siegfried (1977) test the influence of several market structure variables on direct policy outcomes in the form of a Tax Avoidance Rate on the basis of the US

Federal Corporate Income Tax Rate across 110 industries. Surprisingly, market concentration negatively affects the Tax Avoidance Rate in the empirical model. While Salamon and Siegfried (1977: 1038) blame their concentration measure for this outcome, other scholars hypothesize a negative relationship right from the start.

As Grier et al. (1991: 729) point out, the argument against a positive relationship between concentration and influence does not deny the validity of the free-rider argument. What is neglected in the above-cited literature is the demand side of favorable policy outcomes. Zardkoohi (1988) stresses that small and competing firms are the ones who need government protection to survive. Large firms have the capabilities for efficient lobbying but no incentives since they already enjoy high profits extracted from their market power. Small firms in large industries need government protection but face free-rider problems, high information costs and lack the necessary resources. Which effect prevails?

Considering previous research, Grier et al. (1991: 730) state that obviously the correct relation between industry structure and its political activity cannot be resolved theoretically. Interestingly, their empirical results show that both sides are right: political activity rises to a concentration ratio threshold of 0.5 and then drops, indicating that firms' incentives to lobby do indeed decrease as soon as they reach a significant market share. Below the 0.5 threshold political activity increases with concentration. In other empirical results a positive relationship prevails (e.g. Pittman 1988; Zardkoohi 1988; Esty and Caves 1983; Andres 1985).

Pittman (1988) offers a fruitful new contribution to the debate by incorporating rent-seeking elements into the market structure approach. In addition to the common structure variables, he includes a measure for available rents in a given industry to explore how sensitive the level of rent-seeking is to the rents available and "*...to the ease of organizing a particular group of potential seekers.*" (Pittman 1988: 174). The argument is simple: a firm will employ resources for lobbying only if anticipated benefits exceed the costs of doing so. The benefits depend on the rents available. Pittman (1988: 176) uses federal government purchases and a dummy variable for regulative environment to estimate the amount of rents available to an industry. In his

model he finds a positive relationship between rent-seeking activities and available rents, but only in concentrated industries.

Criticism of these models deems necessary in general but also in particular when applying them to my framework. First, even if one finds significant results of market structure variables affecting observed political influence, the mechanisms behind it remain blurry, especially when connecting structure variables directly to political outcomes. Other factors must be expected to have even bigger influences, such as political systems and features of individual large corporations. Demsetz (1973) criticizes approaches of industrial organization additionally for being too much concerned with monopolies and market concentration. As he points out, firms in highly concentrated industries do not necessarily have to employ their resources emerging from their dominant market position to lobby governments for further protection. If the “...source of some monopoly power is superior entrepreneurship” (Demsetz 1973: 3), then this monopoly does neither lead to inefficiencies nor does it depend on government protection.

“It is not easy to ascertain why G.M. and I.B.M. perform better than their competitors. The complexity of these organizations defies easy analysis, so that the inputs responsible for success may be undervalued by the market for some time.” (Demsetz 1973: 2)

Following Demsetz (1973), one should not condemn monopolies for causing severe welfare losses *per se*, but instead analyze first how the monopoly emerged: through government protection or superior performance. I will later argue that this question is undisputed in the European airline case: monopoly power of flag carriers originates in the previously heavily regulated environment and is therefore clearly caused by protectionist policies of the past. They do also suffer from inefficiencies as shown in the analyses of Kenneth Button (1996) and Good et al. (1993). So even if some of the industrial organization approaches suffer from over-simplicity, core elements are applicable to my theoretical framework.

Second, scholars of industrial organization as well may face an endogenous problem. Protectionist policies are not formulated exogenous from those trying to affect them to

their own benefit. When not theorizing and testing carefully, the argument is likely to become circular: highly concentrated industries are politically influential and therefore highly concentrated. My model includes a time lag to separate those effects.

Third, why has political activity been estimated by structure variables if these deficiencies exist? Probably because economic data of firms is easily accessible in several databases. Data on political activity within the US is also available in the form of PAC contributions. Demsetz (1973) confirms this suspicion: he scrutinizes the search for monopolies in the tradition of industrial organization and ascribes it to “...*the ease with which industrial concentration data can be secured.*” (Demsetz 1973: 1).

Finally, the reviewed literature considers corporate power in the United States exclusively. Homogeneity of the political system is hence given. The striking difference is that I use elements of the structure-performance approach to analyze one particular industry, i.e. aviation in the European Union. Instead of explaining cross-industry variations of political influence, I try to develop a model of cross-country variations within one industry.

Within the European Union, no homogenous data on observable political activity exists, which is why I go along with the approach of Salamon and Siegfried (1977), linking structure variables to policy outcomes, i.e. the level of protection in the airline industry of the EU. Therefore, it is rather a pragmatic theoretical approach – always keeping in mind that unobservable factors also affect political activity.

Subsequently, I theorize the level of protection and its consequences, building upon the reviewed literature on economic regulation in the airline sector.

4. Theory

The central concern of this thesis is to explain how protectionist measures persist in service sectors that are subject to deregulation. How do corporations of previously heavy regulated markets – as the airline industry – influence national policy makers and European Union institutions to further have their historically given dominant market position protected?

Since 1993, Articles 81 and 82, as well as 85 and 86 of the EC Treaty apply to the airline industry of the European Union. The former address anti-competitive issues, the latter are concerned with abuses of dominant market positions (Abeyratne 2001: 1162). Confronted with the rules of the Single Market, European Union flag carriers face increased competition, especially on domestic and intra-European routes. To sustain their privileged market positions, airline officials press for state aid and market entry barriers, classified as protectionist measures. *The stronger their influence on national and European policy makers, the more protection they will receive.* Their influence depends thereby on macroeconomic and firm-specific structure variables.

This chapter consists of two segments. While the first part addresses the *why* – that is – the utility of protectionist measures, the second focuses on the *how* – the mechanisms of achieving protectionist policies. First I apply theories of economic regulation and competition policy to the airline industry. National flag carriers have enjoyed large-scale economic benefits before 1993. Just because the market is now formally deregulated does not mean that they do not continue to seek economic rents through protectionist policies. Deregulation is therefore a necessary, but not sufficient condition for competitive airline markets. The second part – addressing the *how* – highlights the factors which account for a variation in protectionist policies reached through political activity of companies by applying the structure-performance approach of industrial organization combined with the political role of board directors within a corporation.

4.1. General Assumptions

Before proceeding, a few underlying assumptions must be highlighted. Within the scope of this analysis large European corporations, including airlines, are assumed to be political actors in their own right on the Member State level. Associations support airlines on the European level in mediating their interests. All actors – political and economic – are assumed to be rational and utility maximizing. Economic actors as well as political actors will hence seek rents if possible and if they are to their benefit. I further follow George J. Stigler (1971: 3) in assuming that economic regulation is generally designed and operated solely for a corporation's or industry's benefit.

Airline industry deregulation is a very complex issue. Three operation levels have to be de- or re-regulated: control systems (safety), airports (infrastructure) and airlines (competition) (Knieps 1996). The task of the European Union is therefore a complex mix of deregulating airlines to guarantee competition and low prices, re-regulating control systems to affect safety and efficiency and – last but not least – deregulating airports to ensure competition on the one hand, and public service obligations on the other. Due to this complexity I assume that information asymmetries exist between political and corporate actors. Bargaining for pareto-optimal solutions between corporate and political actors is costly and therefore – following Coase (1937) – transaction costs are high.

The European Commission equally sets the general regulatory framework in a sense that the rules of the common aviation policy as well as of competition law apply to all Member States. Nevertheless rational governments anticipate EU rulings and can therefore circumvent them if necessary, leading to a discrepancy of *de jure* and *de facto* liberalization of the airline market.

Focusing on passenger air transport, I assume that airlines produce homogenous outputs: they transport passengers from point A to B. Additionally, prices for airline services are transparent. These conditions ease market entry for new competitors in a deregulated market since costs for determining entry prices do not apply (Knieps 1996: 71).

4.2. Theory I: Seeking Protection

In this part, the emergence, elements and consequences of protectionism are highlighted within the theory of economic regulation. Second, a rent-seeking approach is used to identify the motives for demand and supply of protection. Third, the two protectionist policy tools – subsidies and control over entry – will be identified and conceptualized before applying them to the airline industry.

4.2.1. Competition and Contestability

The European Airline industry has been heavily regulated until the early 1990s for several reasons: besides the economic reasons, safety issues, environmental protection as well as prestige of the flag carriers accounted for regulation. In a strictly economic perspective, the aviation sector was regarded as a natural monopoly. According to Scherer (1980 in Braeutigam 1989: 482):

“The most traditional economic case for regulation assumes the existence of natural monopoly – that is – where economies of scale are so persistent that a single firm can serve the market at a lower unit cost than two or more firms.”

Following this logic, competition leads to decreasing returns to scale, reduced price-stability and efficiency. If this is true, regulation is needed for efficiency. But as was shown in the deregulation processes of many industries – among them the US airline industry in the 1970s – the inverted logic seems to be more appropriate: free and straight competition causes an efficient allocation of resources (Wenglorz 1992: 7).⁸

Stigler (1968: 16) identifies the unlimited number of actors, perfect knowledge and divisibility, as well as the absence of all barriers to entry as sufficient conditions for perfect competition. These conditions are strong and I will go in line with Stigler who subsequently relaxes the actors' condition to a degree that *“...a large number of rivals is sufficient to achieve competition.”* (Stigler 1968: 17).

⁸ For a detailed discussion of positive and normative regulation theories see Braeutigam (1989) or Noll (1989).

True competition is a perfection that is hard to reach. The relaxation of the conditions for competition leads to the concept of contestable markets, which seems more likely to be the goal of a deregulated market. Here, the actual number of rivals plays a minor role. What accounts for efficiency in an industry is *potential* competition. Under the conditions of free market entry and the absence of sunk costs – that is exit is free – there is a credible threat of potential rivals which leads to quasi-competition with only few actors. A contestable market can fulfill identical functions as a truly competitive market. Two of these functions are important in the scope of this analysis. First, equality of distribution and variations in income is a function of efficiency differentials. Second, the optimal allocation of scarce resources serves to maximize general welfare. Factors of production are employed efficiently and the structure of production is in line with demand (Knieps 2001: 4).

Following this logic, a successful deregulated service sector or industry needs to meet the conditions of contestability. Formally, the airline industry has fulfilled the conditions for a contestable market since 1993. After the elimination of legal market entry barriers potential competitors wait for entering the market. Investments for market entry are reversible and without sunk costs, market exit is possible (Knieps 1996: 70).

Protection occurs when special interests seek monopoly rents and inefficient production leads to a discriminatory allocation of resources, i.e. contestability is purposely hindered. The remainder of this chapter will identify how conditions for contestability are *de facto* fulfilled in the European airline industry.

Postulate I:

In a protected market, conditions for contestability are purposely impeded to supply special groups with rents.

Postulate II:

State aid and control over entry are protectionist policy tools if they hinder contestability.

4.2.2. Rent-Seeking

Profit-seeking under competition is the economic norm with positive rents promoting market-entry and negative rents causing exit. Socially wasteful rent-seeking emerges when economic rents are contrived artificially and redistributed through government action (Tollison 1982: 577). In the traditional view, successful rent-seeking activities supply a corporate actor with monopoly power. In this dominant position the actor increases the price level above the competitive market price. The rent – defined as the price differential – is simply redistributed from consumer to monopolistic producer. But lobbying for rents is costly. Corporate actors have to offer support to public actors for which they will compete: depending on demand and supply of rents, resources must be employed on both sides. These resources are wasted in addition to the loss of consumer surplus (Tullock 1980 in Drazen 2000: 336). The total social loss of rent-seeking activities exceeds the monopoly rent extracted within a protected sector, and in the worst case, lobbying costs absorb the monopoly rent entirely.⁹ Analogous, protectionist policies are socially wasteful by hindering competition and efficient allocation of resources, and they are exceedingly wasteful if lobbying for these policies is costly.

Postulate III:

Subsidies and barriers to entry are socially and economically wasteful protectionist policy tools if they

- (a) lead to privileged market positions vis-à-vis potential competitors – that is – if they distort competition.*
- (b) emerge out of costly rent seeking activities – that is – the producers' surplus of the monopoly rent is partly wasted through costly lobbying.*

Each of these tools is now discussed and applied to the case of the European Airline Industry.

4.2.3. State Aid

“For working purposes, a subsidy might (...) be considered to be any government action which causes a firm's, or a particular industry's, total net private costs of

⁹ However, as Magee, Brock and Young (1989) show, the entire GNP can be used to lobby politicians. In this extreme case, the entire GNP is wasted in this “blackhole”.

production to be below the level of costs that would have been incurred in the course of producing the same level of output in the absence of government action.” (Malmgren 1977: 22).

This definition treats any government action to the financial benefit of an industry as subsidy. To separate subsidies from barriers to entry, we need a clearer definition of the government actions concerned. Therefore I will define a subsidy or state aid¹⁰ as *any financial contribution by governments or public institutions to a firm or an industry that benefits its financial situation and makes it better off vis-à-vis real or potential competitors*. In this connection I assume government action to include direct financial state aid, aid to complementary elements that lower an industry's costs – such as airports, and tax exemptions for a corporation or the entire industry. Theoretical state aid considerations are directly applied to the special airline industry case in the next chapter.

4.2.4. State Aid in the Airline Industry

Article 88(1) of the EC Treaty generally prohibits state aid in whatever form, but the Treaty also provides for both mandatory and discretionary exemptions from the general rule. Here, the latter is of importance: in Article 88(3) of the EC Treaty discretionary exemptions allow the Commission to approve state aid in a variety of cases. The Commission most frequently accepts the exemption contained in Article 88(3c) in the case of the airline industry. This allows “*...aid to facilitate the development of certain economic activities or economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest...*” (Doganis 2001: 203).

Interpretation of Article 88(3) EC Treaty leaves sufficient room for maneuver for the Commission to authorize state aid to airlines. Earlier I have clarified under which conditions state aid is socially wasteful. But does the Commission have all the information needed to ensure that granted subsidies are not misspent and that they do not unnecessarily distort competition within the common market? What principles does the Commission follow in approving subsidies and why should airlines receive subsidies at all, especially after the market has formally been deregulated?

¹⁰ The term “state aid” will be used analogous to “subsidy” throughout this thesis.

Doganis (2001: 203) argues that national airlines deserve compensation for costs and penalties imposed by government action. In this context he especially refers to public service obligations on domestic and international economic unprofitable routes. Additionally he argues that airlines had to give way to governmental pressure in terms of management and staff concerns, which led to inefficiencies and to excess employment. He resumes that *“If ‘state aid’ is used primarily for capital restructuring of an airline and, in particular, for the writing off of accumulated debts, then it appears justifiable. It is correcting an imbalance between state-owned and privatized airlines which have had access to equity capital”* (Doganis 2001: 205).

Past 1993, the justifications for airline subsidies have changed. Government money is now employed for restructuring plans that ought to prepare airlines for the new challenges in a deregulated and more competitive market. Generally, it seems dubious that inefficiencies emerging from state aid will be eliminated by the same means. An efficiency downward spiral is likely to emerge.

This state aid logic also needs to be interpreted within my competition policy framework with the assumption of the ease of market exit. Following this strictly, airlines with an inefficient employment of resources exit the market and are replaced by new competitors. We have to relax this principle slightly when applying it to the mentioned public service obligations. Most routes with public service character are not sufficiently profitable and would not be operated when the inefficient national carrier exits the market.¹¹ In a few cases, state aid is therefore justifiable to guarantee a certain public infrastructure.¹²

But how does the European Commission decide? In its guidelines on state aid in the aviation sector, the Commission (1994) outlines the central “market investor principle”, which is used for assessing whether public funding constitutes state aid: *“...as a general rule the aid will be assessed as the difference between the terms on which the funds were made available by the State to the airline, and the terms which a private investor operating under normal market conditions would find acceptable in providing funds to*

¹¹ Doganis (2001: 190) points out that many governments expected their national carrier to fly scheduled and unprofitable services to certain points to achieve social or economic objectives or *“to show the flag.”*

¹² Take for example routes to islands or laggard regions, which are not profitable. Nevertheless people depend on these routes and airline operations must therefore be supported by the government.

a comparable private undertaking.” (Commission 1994). In other words: if a fictive private investor would have invested the same funds as the government under anticipated market conditions, state aid turns into quasi private investment. Nevertheless, I classify these investments as state aid for two reasons.

First, I agree with John Balfour (1995: 159) concerning the difficulty, “...*if not impossibility...*” of hypothesizing about the frame of mind of a fictive private investor. It is likely that a private investor would want to have some influence over the company after having spent a large amount of money. To ensure high returns on his investment, he has a larger interest in streamlining the company and increasing its efficiency than governments. Considering this, a crucial difference exists between *real* and *hypothesized* private and public investments. The company will be better off with government money in the short term to compensate current losses while a private investor will restructure to ensure high returns in the long run.

Second, it is problematic to assess what constitutes a “normal market condition”. If private and public investors’ utility functions differ in terms of their time horizons, then their judgment of current market conditions will also diverge from national governments or the European Commission.

Third, I assume that national governments realize the above described deficiencies of the blurry legal basis. Governments can therefore disguise subsidies in the form of private investments if they want to do so.¹³ Large-scale, public funding of airlines not classified as state aid by the Commission on the grounds of the market investor principle will hence be identified as state aid within the scope of this analysis.

The approval of aid cases not falling under the market investor principle is due to conditions outlined in the report of the “Comité des Sages” (1994). State aid can legally be granted to airlines if it is used for restructuring programs exclusively and if it is granted on a *one time last time* basis. Further, state aid should not grant airlines competitive advantages, must be transparent and controllable, and the recipients are not

¹³ In 1996, the Spanish flag carrier Iberia has for instance received an investment of ca. 430 million Euro from Teneo – a government-owned holding company. On the grounds of the market investor principle this investment has not been classified as state aid, although Teneo is state-owned. In 1999, Iberia has again received a public funding of 110 million Euros, not classified as state aid (Commission 1997: 227).

allowed to acquire shareholdings in other airlines. These conditions have been violated by Member States in a number of cases.¹⁴

My central argument is that airlines will further demand protectionist policies in the deregulated market, but that the means of receiving protection change. Hidden subsidies and control over entry can be seen as Non Tariff Barriers (NTBs) in analogy to trade policy theories (e.g. Mansfield and Busch 1995): with the liberalization of international trade, tariff protection is likely to be constantly replaced by subliminal but effective NTBs. The result is what Bhagwati (1988: 53) terms the “...*Law of Constant Protection: If you reduce one kind of protection, another variety simply pops up elsewhere*”.

What should have become clear now is that Member States can circumvent European Union rulings to achieve *constant protection*. If Member States wish to grant subsidies to their airlines, they can, for example, do so by disguising them as private investment. Balfour (1995: 159) finds a lack of formal, reasoned decisions in most cases concerned with the market investor principle because the “...*Treaty’s rules only call for formal investigations and decisions in connection with the question whether an aid is compatible with the common market, and not with the preliminary question whether an investment constitutes aid at all.*” The European Commission can therefore not be considered as a serious obstacle to protectionism in the deregulated airline sector.

Having now clarified why and under what conditions subsidies are granted in the airline industry, we need to find out why they are special compared to other industries’ subsidies. In the theory of endogenous protection the level of protection – let’s say reached through an uniform tariff – is explained by self-interested acting individuals and groups, as well as by the political system (Magee 1997: 526). The assumption is thereby that an entire industry is protected. This does not apply to the airline industry for (a) the obvious reason that direct tariffs on foreign air services are legally prohibited, but more important (b) that if protection is reached, it is limited to a small number of actors

¹⁴ An amount of 2.1 billion Euro has, for example, been approved by the Commission for the Greek airline Olympic on a one time last time principle in 1994. This amount has been split and paid in annual installments by the Greek government, although the Commission (1997: 228) has identified serious compliance problems with the restructuring plan. The Commission (1997: 228) further suspects Greece “...*to have granted further aid to Olympic and to have interfered in the management of the airline to an extent which goes beyond its role of shareholder.*” This suspicion remains unconfirmed.

within the industry: the national flag carriers. One can therefore also speak of intra-industry – domestic and international – protection. Next I theorize market entry control before applying barriers to entry to the airline industry.

4.2.5. Control over Market Entry

Within the European single market, market entry barriers have been abolished for most sectors and industries, but the absence of formal market barriers is only a necessary, not a sufficient condition for fair competition, subsequent lower prices and better supply for customers (Gischer 1996: 240). Indirect entry barriers lead to market power of only a few companies in an industry. This market power is often abused to crowd smaller companies out of the market:

“The problem of market power in air transport has emerged primarily in systems where old style regulation has been removed. It derives from the advantages enjoyed by large normally incumbent carriers within a competitive market, and the economies of scale and scope they enjoy.” (McGowan 1994: 4).

Gilbert (1989 in Knieps 2001: 14) defines barriers to entry as a *“...rent that is derived from incumbency. It is the additional profit that a firm can earn as a sole consequence of being established in an industry.”* According to Knieps (2001: 15), this rent must be understood as a monopoly rent. The value for an incumbent company to establish barriers to entry is hence defined by the amount of the rent it receives by doing so. But interpreting that rent in the context of my rent-seeking approach leads to the conclusion that the actual rent will be lower than the monopoly rent as predicted by Knieps (2001), because lobbying costs waste part of the rent.

The problem with Gilbert’s definition is that it is output-biased – that is – it does not tell us how the rent is derived. Demsetz (1968 in Knieps 2001: 19) offers an input-oriented definition where barriers to entry exist when inputs of production are not free to all potential rivals. The airline industry is a network industry depending on a certain network infrastructure to operate. Knieps (1996: 68) differentiates between three operating levels in the aviation sector. Level I constitutes the air transport supply (operating airlines). Levels II and III are the configuration and the operation of air

traffic control systems and airports. Analogous to any producing industry, which needs input resources as factors of production, airlines (level I) depend on access to control systems and airports (level II and III) to operate. While air traffic control systems are an indispensable element to guarantee the safety of air traffic, they have a minor influence on market access of airlines and will therefore be neglected in the scope of this analysis.¹⁵ I will now theorize how disproportionate access to capacity constraint airports will distort competition and foster protectionism in the European airline case.

4.2.6. Barriers to Entry: Discriminatory Slot Allocation

The European aviation market is increasingly characterized through “hub-and-spoke” networks.¹⁶ Depending on the size of a given country, only one or a small number of hub airports account for a large share of airline operations. Most of these hubs are congested, at least at peak times, and are therefore classified as coordinated airports by the International Air Transport Association (IATA). Slots can only constitute a barrier to entry when the condition of scarcity at an airport is given. At congested airports this is the case due to capacity constraints: at peak times, demand for slots exceeds supply. According to the IATA (2002: 11):

“A slot is defined as the scheduled time of arrival or departure available for allocation by, or as allocated by, a coordinator for an aircraft movement on a specific date at a fully coordinated airport.”.

In the EU Member States formally independent airport coordinators manage the slot allocation at the respective airports. At biannual IATA Schedule Conferences the flight schedules of every member airline are coordinated and adopted. The detailed criteria of allocation are subject to Council Regulation No. 95/93 of 18th January 1993. This disputed Regulation grants airlines grandfather rights. That is, airlines can keep their slots from season to season, as long as they use them to an 80 percent minimum (use-it-or-lose-it rule). Newcomers receive 50 percent of the free slots in the slot pool and the gratuitous exchange of slots is allowed. The grandfather principle is of central

¹⁵ The politics of creating, coordinating and operating air traffic control systems in the deregulated European aviation sector would be a topic in its own right.

¹⁶ „In a hub-and-spoke network, traffic is collected from feeder points and consolidated at a hub before being redistributed by further flights to other destinations.“ (Gonenc and Nicoletti 2000).

importance and heavily disputed. According to Gischer (1996: 241) it contradicts every economic rationale: the allocations are historical incidental, sustain biased competition advantages of established airlines and give therefore no incentives for efficiency-oriented behavior. Ewers (2001) goes in line with this by identifying three types of inefficiencies that occur from the current administrative allocation criteria in general and from the grandfather rights in particular:

Allocative inefficiency occurs when “*Slots do not fall to those (airlines) which express the greatest willingness to pay for them and therefore produce the greatest benefit for the overall economy.*” (Ewers 2000: 2)

Competitive inefficiency occurs when “*The system prevents newcomers (airlines) access to the market at attractive airports and thus also reduces the competitive pressure on long-established providers in the long term.*” (Ibid.)

Infrastructural inefficiency occurs when “*The proceeds from the scarcity of slots do not fall to those having the means at their disposal to eliminate it in the short or long term (...), namely the airports.*” (Ibid.)

The first two inefficiencies especially inhibit contestability of the airline market as described in chapter 4.2.1: if these inefficiencies occur, equality of distribution and differentials in income are no longer a function of airline efficiency differentials. They naturally distort competition to the advantage of *long established providers*, which are flag carriers. These considerations already point to the necessary reform of Council Regulation No. 95/93. The reviewed studies on this topic propose a wide range of market oriented slot allocations to eliminate the inefficiencies arising from the current procedure.¹⁷ All of the suggested solutions aim to improve the allocation of scarce takeoff and landing capacity by means of market mechanisms. Even the European Commission (2001b: 3) itself is aware of the current deficiencies of Council Regulation No. 95/93:

¹⁷ For a detailed discussion on reform potential see Borenstein (1989; 1991), Gischer (1996) or Starkie (1998)

“...the current rules have proved to be insufficient to provide for clear definitions and appropriate enforcement mechanisms. Hence, there is a need to clarify the legal nature of slots, ensure the transparent, neutral, and non-discriminatory airport capacity determination and set up slot allocation procedures by legally and factually independent coordinators.”

Therefore the question arises why this regulation has been deferred up to date. The Regulation is designed to the advantage of incumbent flag carriers. But its pure existence does not involve government action, or – vice versa – flag carriers do not have to lobby for this Regulation because it already serves their interests. But more important within the scope of this analysis is my argument that Member States can supply flag carriers with airport access *beyond* the formal Regulation rules because of their shaky legal reasoning.

The most basic legal problem is probably the question of property rights in slots: it is simply not clear who owns the slots. William H. Riker and Itai Sened (1996) develop a political theory of property rights and apply it to airport slots on the U.S. market. They show that, during the phase of deregulation in the United States, scarcity led governments to create slots as common property, before private property in slots was created. Governments have particularly incentives to create and hold slots as private property, because they can exchange these rights for political support.

In the European Union, slots neither belong to airports nor airlines, and EU law does not recognize any ownership position in slots that cannot be revised (Ewers 2001: 9). If, after all, slots are administratively allocated, then airports should at least fulfill this task:

“...from an economic (normative) point of view, slots, which are scarce property rights, should always be allocated to the party that possesses the effective incentives, the best information and the capability to eliminate scarcity. These are in principle the airports, who are uniquely positioned to eliminate scarcities in the long term with a whole set of potential expansion options.” (Ewers 2001: 10).

Slots are not allocated by airports within the EU, but by national coordinators, which are supposed to be neutral. They do not belong to airports and are appointed by national

governments. According to Wenglorz (1992: 123), the Commission lacks regulation on the question who pays the coordinators and the possibility exists that they receive their salaries from national airlines. This would clearly contradict the conditions of neutrality and transparency of the allocation procedure. But these are suspicions which cannot be proofed empirically and remain therefore implicit within this framework. What can be assumed is that relatively high levels of hub dominance result partly from governments exploiting the blurry status of slots and its regulation.

I theorized that national flag carriers have a historically given competitive advantage through the grandfather principle leading to hub dominance of flag carriers. Additionally as long as the legal status of slots and the independence of the coordinators remain vague, Member States can still influence the slot allocation to the advantage of their carriers if necessary. The logic is thereby similar to the one applied to the subsidy case: taking into account the ambiguous regulations, the Commission is not a serious obstacle if Member States want to supply their carriers with control over entry in the form of limited airport access to competitors due to discriminatory slot allocation.¹⁸ And this is especially likely to happen if airports are under governmental control – that is, if the government holds a large equity stake of national airports, which is now illustrated.

4.2.7. Airport Privatization

Airports constitute complementary infrastructure to airline services. They are simply the necessary basis for airlines to operate. In contrast to the subsidy-literature on European airlines, surprisingly few studies exist concerning public funding and ownership structures at European airports and the consequential entanglement between flag carriers and airport operators – probably because of good reason: the topic of increasing airport competition through privatization is a difficult one since airports partly have a public infrastructure character (e.g. Wolf 1996). Private investors are assumed of not being capable to guarantee the necessary investments for public service obligations. Additionally, regional employment policies play a major role. Airports are often large employers and privatization is connected with the fear of losing jobs (Wolf 1996: 191).

¹⁸ Access to airports or ‘hub dominance’ is chosen to illustrate entry barriers for simplicity reasons. Other factors such as ‘code sharing’ – a cooperation agreement between two or more (mostly allied) carriers – are in practice for circumventing grandfather rights through slot takeover in ‘real life’. (e.g. Beyhoff 1995: 128).

Nevertheless, the interaction of flag carriers and government owned airports is a serious obstacle for creating a competitive airline industry. Wolf (1996: 192) illustrates the interactive status with an example. He points out that major European hubs owe their significance to the flag carriers – and not vice versa. This is exemplified with the case of Frankfurt/Main, the home hub of Lufthansa, which has decided to operate from there increasingly over the past 40 years. To support their national flag carrier, the German government favored investments to Frankfurt/Main over competing airports. And further, based on its fleet structure, Lufthansa has only been interested in routes profitable for large planes. Small and potentially competitive carriers lacked the incentive to serve and expand neglected routes simply because they feared to be pushed out of the market by Lufthansa as soon as the routes turned sufficiently profitable.

Additionally, the earlier illustrated logic behind the disproportionate allocation of slots among airlines also applies to airports. Since airport operators have no influence on the allocation process, slots are allocated disproportionate among national airports. Large hubs cannot supply new rival airlines with slots – no matter how much they would pay. New and private airport operators use this slot supply gap by restructuring military or small regional airports for new and profitable low cost carriers (Wolf 1996). Instead, excess demand of slots could be redistributed to already existing and not capacity constraint airports. This rigid system will be difficult to reform under governmental control.

Therefore, I assume governmental control of airports to be an obstacle to deregulation. I consider governmental control as protectionist – that is – if the government holds a large average share in its national airports. Shareholdings in airports by other public institutions or regional governments will not be judged as protectionism, since they might be justified for infrastructure or regional policy reasons.

To sum up, in this first theoretical part the following mechanisms have been identified and applied to the case of the European Airline Industry.

First, protectionist policies emerge from hindering competition for the benefit of an industry or firm. State aid and barriers to entry are tools to distort competition.

Second, resources need to be employed for effective lobbying activities to receive these tools by an industry or firm, and resources have to be employed by policy makers for granting these tools. The privileged market position emerging from effectively employed protectionist policy tools embodies the firm to extract rents above market price, which are in return partly wasted for the lobbying activities to sustain the market position.

That leads to the first conclusion that if protectionism exists, it must be assumed to be economically and socially wasteful. The European flag carriers need to employ resources to ensure their dominant market position in a formally deregulated market. When in need, the carriers will lobby for subsidies and entry barriers. The Commission, as main regulatory body, is no obstacle due to a lack of information and a blurry legal basis. I now focus on the factors accounting for the differing protectionist levels across the European Union corporations' political influence.

4.3. Theory II: Corporations' Political Influence

So far, I discussed the emergence of protectionism in general and in the case of the European airline industry in particular. If corporations have the special interest of being protected, they need political influence to successfully lobby for this interest. This chapter serves to enumerate the factors determining the political influence of industries and firms, and to hypothesize that protectionist policies are, after all, a function of a firm's influence. Although theorizing political influence and activity is possible, it remains problematic to measure it in a quantitative manner since most lobbying processes are informal. In a rather pragmatic fashion I therefore theorize the relation between policy outcomes and *structural characteristics* of interest groups instead of *direct lobbying activities* in line with the structure-performance approach of industrial organization (Potters and Sloof 1996: 415) and Mancur Olson's Theory of Collective Action. Since airlines are assumed to act on their own behalf, it is their corporate and sectoral structure that accounts for protectionist policy outcomes. This approach is now explained.

4.3.1. Economic Structure and Collective Action

Consider a large European economic sector, providing homogenous bids across countries but with cross-country variations concerning its structure. Assume that this sector is highly concentrated within one country, i.e. one corporation produces almost the entire output. On the basis of the Theory of Collective Action and in line with earlier research (Andres 1985; Hansen and Mitchell 2000) I argue that a high level of concentration will positively affect political influence of corporate actors. As Olson (1965: 144) points out, *“The political advantage of the small groups of large units – the business interests – may account for some of the concern about ‘special interest’.”* The argument is straightforward: with increasing concentration, the number of firms drops, which lowers the incentive to free-ride. With a decreasing number of firms in a sector – holding total sector size constant – the return on resources invested for lobbying increases. A highly concentrated sector constitutes a small group of large units representing special and privileged interests.

Additionally the average size of single firms within the sector increases with concentration when holding sector size constant. The larger the firm, the more resources emerging from market power profits can be employed for lobbying activities, which simultaneously increases political influence.

Hansen and Mitchell (2000) argue that the institutional visibility of a firm also increases with its relative size within the sector. They hypothesize a positive effect between institutional visibility and political influence *“...because the corporation is likely to attract the attention of other interests and of policymakers, which could raise (regulatory) costs and negatively affect profits. In order to counter the threat of a public policy backlash, all forms of corporate political activity will increase as visibility increases.”* (Hansen and Mitchell 2000: 893). In this case, firms have caused attraction negatively. They need to counter mobilize competing interests, which increases political activity and political influence.¹⁹

I argue that institutional visibility also increases with prestige of a firm. In this opposite case, firms attract positive attention depending on their size and prestige. Here, a firm’s

¹⁹ Take for instance a corporation causing an affair due to financial statement forgery. Depending on the size, the affair will be more or less severe – which is visibility. According to this theory, to prevent harm from the firm in the long run, it will increase its political activity mounting in more political influence.

political influence increases independently of its activity simply by sympathy of legislators and other interest groups.²⁰ The influence can therefore be expected to maximize with prestige, size and the magnitude of need for help in a given situation. Considering this, institutional visibility will be caused by public attention. If attention is caused by negative events, the firm reacts with political activity to counter mobilize. If attention is caused by sympathy, political influence will increase naturally. Both ways, visibility and consequential influence will increase with firm size, especially in the European airline case. National perceived prestige of flag carriers will not vary substantially across countries, but their relative size does. A relatively large carrier is likely to attract more attention than a small flag carrier – holding prestige constant.

4.3.2. Corporate Structure and Intra-Firm Lobbying

The factors considered so far are problematic in a sense that political influence is only estimated by firm size and market structure. But airlines are large political actors themselves. Therefore this chapter focuses on their legal structure and the government stakes involved. As in many service and network sectors, governments still hold equity stakes of their flag carriers. What role does state ownership play for policy outcomes?

Intuitively, one might judge that state-owned companies are automatically protected by their national governments. However, state ownership does not self-evidently equal protectionism and vice versa. Privatized airlines can as well lobby for government support as state owned airlines. Andrei Shleifer and Robert Vishny (1994: 998) put it simply: *“In principle, there is no magic line that separates firms from politicians once they are privatized.”* Especially not if private as well as state-owned firms face the same conditions and control in line with the European Single Market where state aid is closely monitored.

In the airline case, the Commission has not incorporated any provisions limiting state shares in airlines into any of the three liberalization packages (Travis 2001: 110).

²⁰ The cases of grounded airlines due to financial problems illustrate this effect. The best example is probably the case of Swissair, which has been grounded in autumn 2001. As René Frey (2002) points out, within a few days 4.5 billion Swiss Francs have been granted by the government and private firms to the struck airline. Sympathy for grounded passengers around the world coupled with the fear to lose a national symbol triggered this economic irrational rescue of Swissair (Frey 2002: 31).

Barriers to entry as well as subsidies have been abolished – and these rules affect private and state owned airlines likewise. If subsidies and other government support are formally prohibited, the question arises why governments would not sell their shares and privatize the airlines? Figure 1 illustrates a comparison between state shares in 1995 and 2000. Six out of 16 countries under consideration hold majority shares in their national airline still in the year 2000. Only two have been privatized completely during that period, and one – British Airways – prior to it.

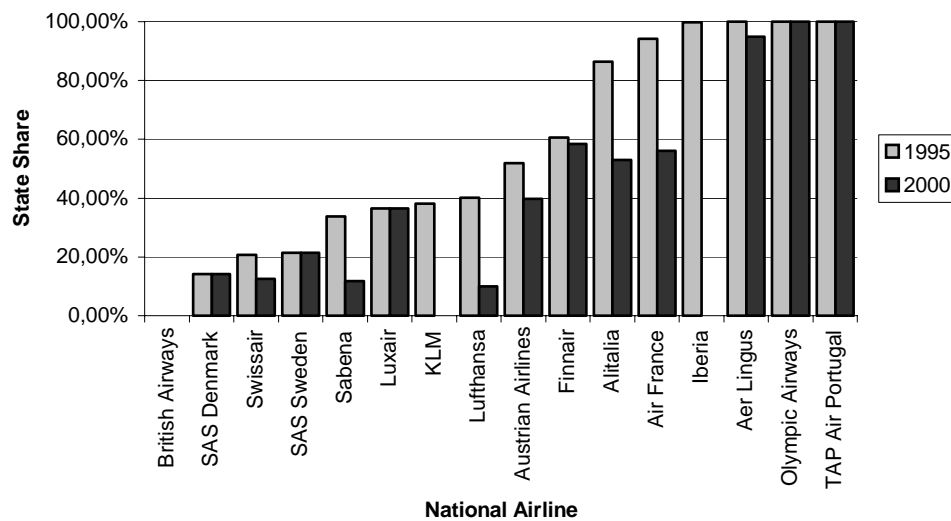


Figure 1 Comparison of government equity stakes in national flag carriers in 1995 and 2000; source: AEA (1996; 2001a)

As Doganis (2001: 198) asks: “...if the government is no longer a majority shareholder, should it create a ‘golden’ share to enable it to take back effective control in the event of some specified crisis such as war or threat of a hostile takeover of the airline?”. I argue that keeping a majority share secures governments’ control in general and in emerging crisis in particular. The remaining majority share leaves the door open for further state interventions if needed, but it also lowers airlines’ lobbying costs permanently due to the closeness to the government.

Depending on their remaining government shares, European airlines are in a better position to express their special interests, causing governments to circumvent EU rules or take advantage of the numerous exemptions to state aid and competition laws. They

are in a better position because the likelihood of public officials fulfilling supervisory functions increases with government shares.

From a principal-agent perspective, members of supervisory boards in European companies are employed to monitor, reward, or punish the management on behalf of the shareholders – the board's principals. Board members thereby interconnect the interests of shareholders and management. Agrawal and Noeblé (2001: 180) classify board members into *inside* and *outside* directors. While the former fulfill regular tasks within the company, the latter have a political background, experience, and contacts. Outside directors are firm of government procedures and are capable of predicting government action. Regarding them as a link between corporate and public actors, I additionally argue that they will not only predict government action, but also affect it by mediating the companies' special interests. It can therefore be hypothesized, that the firm's lobbying success increases with the number of outside directors employed relative to the total board size.

From a shareholder's perspective, influence on the board composition increases with the size of individual shareholders. Here, collective action considerations apply analogous to the market structure argument: the larger the shareholders, the lower are coordination costs and free-rider incentives. That is, shareholders' control of the company increases disproportionately to their equity stake. To maximize control, public shareholders will maximize the number of delegated outside directors. Therefore they fulfill a dual function: government control and corporate lobbying.²¹ Political influence – affecting the level of protection – increases with the number of outside directors, which depends on government shares. Protection will be positively related to government shares.

4.3.3. Available Rents: Benefits of Political Activity

Corporate actors are utility maximizer. Before engaging in costly lobbying activities, they will assess their chances of receiving protection. The simple question for the firm is: is it worthwhile to exercise political influence? It is their perception of the regulatory environment and public resources available that determines their utility function. The idea of available rents goes back to studies by Pittman (1988), Esty and Caves (1983)

²¹ For literature on public officials' conflicting interests see e.g. Norbert Meier (2003).

Grier et al. (1994), as well as Hansen and Mitchell (2000), although operationalizations vary. Important factors for availability of rents are general regulatory frameworks or total sales to the government, as for instance in the defense industry. Within my framework, this general concept applies as well: the general perception of available rents in a sector is likely to affect lobbying activities. The cited scholars focus on US industries exclusively, and that makes a crucial difference: they do not have to account for cross-country variations in regulatory environments.

In a cross-country analysis, governments differ in terms of their attitudes towards regulative policies and state aid practices. Positions concerning liberalization of markets also vary within the EU. In my case, the degree of available rents will positively affect protectionism since airlines assess if it is worth lobbying for available government support. If airlines realize that their national government is and has been very generous in supplying industries with rents, they will lobby for a part of it. Other airlines may wish for protection but do not engage in political activity since they evaluate their governments economic policy attitude as liberal.²²

I argue that airlines can assess their government's attitude by evaluating overall subsidies to other firms and sectors in comparable situations. They evaluate the size and the composition of the state aid cake to predict their chances to receive a piece of it, or as Pittman (1988: 173) puts it "*...ceteris paribus, the greater the value of rents available in a particular situation, the higher the level of rent-seeking that would be observed.*". Actors' perception about their governments' state aid attitudes is incorporated into their utility functions about possible lobbying benefits. For this reason, a positive relationship between available rents and the level of protection can be expected. The more rents available, the stronger will be airlines' lobbying activities to receive a piece of it, ultimately increasing their political influence. I now synthesize the two theoretical strands to derive the individual hypotheses.

²² Explanations for political determinants of privatization attitudes are manifold. Bortolotti and Pinotti (2003) explore the effect of political institutions and governments' partisan orientation on the extent of privatization. They find a positive relationship between likelihood of privatization and majoritarian political systems, while partisanship affects the method of privatization.

4.4. Synthesis and Hypotheses

Chapter 4.2. outlines the mechanisms of protection in formally deregulated EU passenger air transport markets.

Conditions for competition or contestability are purposely impeded in a protected national airline market to supply flag carriers with rents, which enables them to sustain or extend their market position. The national level of protection depends on the extent of policies such as state aid and control over entry. Welfare losses increase if achieved rents are wasted through costly lobbying. Due to a blurry legal basis, complexity and information asymmetries, Member States can circumvent EC Treaty rules on competition. Flag carriers that are threatened by increasing domestic and intra-European competition lobby for protection. This causes a discrepancy in *de jure* and *de facto* deregulation of national air transport markets.

Chapter 4.3. determines factors, which positively affect political influence of airlines.

With increasing market concentration – holding market size constant – free-rider incentives and information costs decrease. Political influence increases with raising lobbying efficiency. Since visible airlines attract public attention, influence also increases with the institutional visibility of airlines. The overall amount of rents available within a country affects the lobbying utility function of airline officials. The more rents available, the stronger the incentives to lobby for them. Finally, intra-firm lobbying in state owned airlines will boost influence. Synthesizing these approaches leads to the subsequent hypotheses:

Main Hypothesis:

The more political influence an airline has on national policymakers, the easier is it to assert its special interest: protection from increasing competition within a formally deregulated market.

H1: *The higher the concentration of the national airline market, the higher the protection level.*

H2: *The stronger the institutional visibility of an airline, the higher the protection level.*

H3: *The higher the state ownership level of an airline, the higher the protection level.*

H4: *The more outside directors employed in an airline, the higher the protection level.*

H5: *The larger the amount of available rents in a country, the higher the protection level.*

These relationships are empirically tested in the next chapter.

5. Empirical Test

This part serves to test the expected relationships deduced from the theories in chapter four. First I describe the sample, observation period and data origins, followed by the operationalization of all relevant variables. I construct an index for the dependent variables, which represents the airline industry protection level of the respective sample countries. The theorized relationships are finally tested by means of the ordered logit regression model.

5.1. Sample and Observation Period

How do corporate special interests affect protection in a service sector that is formally subject to deregulation? To clarify this research question an analysis of the airline industry of the European Union is appropriate for several reasons. First, deregulation of the industry is a recent phenomenon. EU Member States have been reluctant to aviation sector reforms until the late 1980s in general, and to abstain from their flag carriers as national symbols in particular. These carriers vary with respect to their size, market share and level of privatization²³ while facing a singular de jure framework prescribed by EU institutions. The liberalization of the US aviation market sets a good example commonly compared to the lagged EU case. However, the uniqueness of air transport deregulation and its obstacles within the EU lies in the heterogeneity of countries involved. The EU case stands out because of the first *transnational* liberalization of bilateral route agreements, in contrast to the *domestic* opening of the US market.

Second, all countries and airlines within the sample face the same EU common aviation policy. The sample countries face similar conditions concerning competition law with the application of EC Treaty law to the aviation sector.²⁴ Holding legal rules constant across countries allows exploring other factors affecting obstacles to competition. If all countries had applied the EU competition rules to their airline markets in 1994 and if no other factors account for protection, then all countries should have deregulated their

²³ With the exception of SAS Scandinavian Airlines, which is jointly operated by Denmark, Sweden and Norway.

²⁴ Although Switzerland is not a Member of the EU, the common European aviation policy also applies to Switzerland as an EFTA Member. Due to its geographical location in the heart of Western Europe, the Swiss airline industry is well-integrated into the EU system.

markets in every respect by the year 2000. *Ceteris paribus* conditions are homogenous within this sample because of the common aviation policy.

Third, the European Union constitutes an appropriate sample for pragmatic reasons: EU institutions aggregate data on airlines' competitive behavior. State aid reports and surveys on competition policy are as well available as airline financial and traffic data, even if their quality and comparability varies.

The final Liberalization Package has been implemented in 1993. I coded the explanatory factors for the year 1994²⁵, capturing airline and market characteristics shortly after the formal completion of deregulation. The dependent variable represents the level of protection in 2000. This means that influential airlines in 1994 will manage to receive protectionist measures at the end of the 1990s, if the hypothesized effects exist.

The time lag serves to prevent an endogenous problem. The independent variables accounting for the political influence of airlines rest upon economic structure attributes such as market shares. I argue that airlines with high market shares in 1994 are sufficiently influential to receive protection in the period past regulation. But without the time lag the opposite effect might prevail, i.e. the magnitude of market share is caused by the level of protection.

5.2. Data Origins

The dataset originates from a variety of different sources²⁶ and the quality depends on the institutions of origin. Basically, the gathered data can be classified into five categories: airline passenger traffic data, state aid and subsidies, macroeconomic data, airport data (concerning ownership and slot allocation) and airline data (ownership and board composition). Subsequently, the data is described by means of the institutions of origin.

²⁵ With the exception of state ownership. This variable is coded for 1995 due to data availability.

²⁶ See Appendix C for a summary of the sources and institutions and Appendix D and E for the dataset.

AEA: Association of European Airlines

The AEA publishes a Yearbook (1996; 2001a) as well as a database called *STAR* (“Summary of Traffic and Airline Results”, AEA 2002). While the AEA was originally founded as a research institution to provide statistical information for European Airlines, it developed to be a political interest group, representing its member airlines at the European level. Data provided by the AEA is voluminous for its 26 European member airlines. Passengers transported by non-member airlines, regional or low-cost airlines are not included into the statistics. This is especially baffling for computing the market shares of individual airlines since the figures do not mirror total market size. Andreas Arndt (2002: 17) identifies other problems of measuring domestic market shares with AEA data. He reports that the AEA defines for example British Airways flights between London and Hong Kong as domestic flights until 1996, which distorts the domestic market’s true size.

While traffic data is not very reliable, the *AEA Yearbooks* (1996; 2001a) contain detailed information about airline corporate structures including financial and ownership status. All of the flag carriers within my sample are members of the AEA and therefore the Yearbook offers the information needed for firm-specific data.

ICAO: International Civil Aviation Organization

The ICAO publishes comprehensive and disaggregated traffic data material in its annual “Civil Aviation Statistics of the World” (1995). The ICAO is a special agency of the United Nations with its Headquarter in Montreal. ICAO surveys contain data on registered airline in its 187 Member States. In contrast to the AEA, it also includes information about small airlines, which is important for the estimation of market shares and concentration ratios. I use this database for the calculation of the market structure variables. “The Civil Aviation Statistics of the World” further offer the segregation of annual passenger figures into total scheduled traffic and international scheduled traffic. By subtracting the figures one can calculate domestic passenger numbers transported by each airline respectively and can thereby determine international as well as domestic market shares. ICAO data is the most comprehensive source for airline-specific figures within the scope of this analysis.

EUROSTAT

The Eurostat (2002) publication “Transport by Air: national and international, intra and extra-EU” contains in particular aggregated material on European traffic. In contrast to the above-mentioned sources, it does neither include data on individual airlines, nor on individual domestic markets. This is why it is inapplicable for market structure analyses. Instead it contains detailed information on city connections and is therefore convenient for route specific studies. It also summarizes official documents and press releases on special deregulation topics. I use this database for general information on the deregulation process.

The European Commission

“The Eighth Survey on State Aid in the European Union” (Commission 2000a) covers national state aid as defined under article 87 EC Treaty, which has been granted by Member States and approved by the Commission. The surveys are published on annual basis since 1998. The Eighth Survey covers the period of 1994-1998. Publishing these surveys helps the Commission to “...*further enhance transparency, provide more timely information and enable the Commission to detect at an early stage new trends in the award of state aid....*” (Commission 2000a: 7). The survey contains official state aid activities within the EU and across relevant sectors and industries. It is therefore especially valuable to gain an insight into general state aid practices of the Member States. The survey is not sufficient to estimate financial transfers to airlines since it excludes general measures and public subsidies that constitute exemptions from article 87 EC Treaty, i.e. subsidies *not* classified as state aid by the Commission. To capture these financial transactions I use the annually published “Report on Competition Policy” (Commission, several volumes). These reports contain detailed discussions on state aid cases and the assessment of compatibility of aid with the common market. It is particularly essential to evaluate cases that constitute exemptions to state aid rules.

Two further studies deserve attention for the analysis of airport owner-structures and hub dominance. “Updating and development of economic and fares data regarding the European Air Travel Industry” (Commission 2001a) is an annual review of economic aspects of the aviation market. Among others, it contains data on slot distributions at several European hubs based on an analysis of airline schedules. My data on slot distribution is complemented by these elements. The second study is the “Study on

Competition between Airports and the Application of State Aid Rules” (Commission 2002b), which includes the information needed on airport ownership status.

The OECD

In 1998, the OECD has set up an “International Regulation Database” (OECD 1998b) on the basis of country replies to an ad hoc questionnaire, comparing regulations and market structures across OECD countries, including a wide range of aviation policy topics but with numerous missing values. This data has been used in the air transport market structure study by Gonenc and Nicoletti (2000) and forms the basis for my slot share data. Since this data originates from an ad hoc questionnaire, it remains unclear if the information given on airport slots are simply estimates from officials, or if they stem from valid statistical material.²⁷ As I have mentioned before, the hub dominance indicator is weak due to these data limitations.

National Airport Coordinators and Airlines

National Airport Coordinators of Germany, Portugal and Switzerland supplied me with statistical material about the true slot allocation at their hubs. Especially the material from the German coordinator is very comprehensive, including slot figures for three German hubs and every airline that has applied for slots in the summer travel season 2000. Additionally, it contains the numbers of slots that airlines actually have received.²⁸ This data allows for computing slot shares of every airline, distinguishing between slots applied for and slots received. This permits the identification of discriminatory allocation procedure diverging from the current rules. Unfortunately, the majority of the coordinators stated that they either do not possess any statistics, or that they have been lost in the restructuring process.²⁹ This leaves us with poor data derived from a diversity of secondary sources for this indicator. I am nevertheless convinced that the data will reflect a tendency of the flag carriers’ hub dominance magnitude.

²⁷ The following two questions are used in the database to identify the slot share status of flag carriers: „What is the share of slots (in total available slots) held by the incumbent carrier in the first largest airport hub?“

„What is the share of slots (in total available slots) held by the incumbent carrier in the second largest airport hub?“ (OECD International Regulation Database 1998).

²⁸ Lufthansa received 57% of total slots among roughly 200 airlines. The next is Condor with only 2,5% and British Airway with 2,3%. All other European and major international carriers remain under 2% followed by more than 100 airlines with less than 0,1% share in total slots!

²⁹ Slot allocation has increasingly become a political sensitive topic. Public officials are apparently cautious in publishing information on national slot allocation procedures. That flag carriers dominate their national hubs is presented as a common wisdom in the literature, but it is rather illustrated in an anecdotic manner than proofed by quantitative material.

The majority of the European Airlines has also been very helpful in supplying me with their annual reports (several volumes), from which *outside directors* could be identified among the board members. Unfortunately, only half of the sample airlines offered transparent documentation on public functions of members besides their board activities.

5.3. The Variables

The variables included in the model will now be operationalized. First I specify the control variables³⁰ before determining the explanatory factors and individual dependent variables, which form the airline market protection index.

5.3.1. Controlling for Macro Conditions

EU Member States face similar economic policies within the common market, but they differ substantially in size and still in economic well-being. It is likely that flag carriers in small and poor EU countries demand relatively more protection when potential competition increases.

First, profitability of a domestic market simply depends on the geographical size of a country. One will for example not find a domestic airline market within Luxembourg. Consequential, Lux Air will need government support to compete on the European and international market and to keep up the routes to and from Luxembourg.

Second, small states depend in particular on international airline markets as well as they depend on international trade. In analogy to the volatility theory of Rodrik (1997), external shocks in the form of international airline crisis as we have experienced after September 11th 2001 will affect flag carriers of small states disproportionate hard since they lack domestic markets. Therefore, a larger government role in the form of protective policies “...as shelter from the vicissitudes of global markets” (Rodrik 1997: 53) can be expected for small states’ airline industries.

³⁰ Control variables are based on own reasoning. Previous research of the structure-performance approach is not concerned with cross-country analysis and does therefore not offer macro control variables.

Relative Market Size (remsi94)

In order to measure dependency on international markets I develop a ratio of annual total country passenger volume to total population. The larger this ratio – labeled as *relative market size (remsi94)*, the stronger is the dependence on international markets. Annual passenger volume exceeds total population when the ratio exceeds a value of one, which is a sign for high activity in international markets. Protection is expected to increase with *relative market size*. Passenger traffic data for this control variable originates from the “Civil Aviation Statistics of the World” (ICAO 1999), data on population from “The World Development Indicators 2000” (World Bank 2000). The variable is coded for 1994.

GDP per capita (gdp)

Controlling for variations in populations’ wealth focuses on the demand side of passenger transport, expecting that inhabitants of poorer European regions simply cannot afford to travel. Demand for air transport might be relatively lower than in wealthy regions. Airlines of Mediterranean laggard countries do nevertheless face the same increasing intra-European competition. My expectation is therefore that flag carriers of relatively poorer countries try to balance out their competitive disadvantage by seeking protectionist policies. This variable is coded as *GDP per capita (gdp)* in 1994.

Budget deficit as percentage of gdp (bd94)

On the other hand one should control for the ability of governments to supply their airlines with protectionist policies. The *budget deficit as percentage of gdp (bd94)* in 1994 (World Bank 2000) accounts for the financial possibilities of governments to further subsidize the air transport sector after the last step of liberalization. Governments have to decide if they can afford further public funding, or if they sell their shares and restructure the airline as quick as possible. Considering this, I expect a negative relationship between the budget deficit and the level of protection.

5.3.2. The Independent Variables

The main hypothesis of the analysis is *the more political influence airlines have, the higher the level of protection in the air transport sector*. The independent variables determine the magnitude of airlines' political influence and are therefore expected to affect the level of protection. While the theoretical mechanisms have been outlined earlier, I now first operationalize the intra-firm lobbying variables *outside directors* and *state ownership* before focusing on the market structure variables, which form the basis for the Herfindahl index of concentration.

Outside Directors

For nine out of 16 flag carriers I collected annual reports of the years 94-96 to identify board members. The boards under consideration are either the board of directors or the supervisory board, depending on the legal form of the respective company. I define directors who have practiced a political mandate in 1994 or prior as *outside directors*. The variable reflects the share of *outside directors* (od) in total board members employed by the airline. Under consideration of the principal-agent approach I assume that airline shareholders are represented by the composition of the board. If this is true, government equity stakes in an airline reflect the number of outside directors employed since governments want to maximize control over the firm.³¹

State Ownership

This variable captures the government equity stakes in the respective airlines. Since equity stake data was unavailable for 1994, I code the variable for the year 1995. It originates from the AEA (1996) Yearbook, which contains detailed documentation on ownership status of all its member airlines. *State ownership* includes government shares as well as shares held by public institutions and state-owned banks. I keep track of the expected correlation between *outside directors* and *state ownership* in the upcoming analysis.

³¹ While Moser (1991: 101) confirms this procedure for the Swissair in 1990 where 22% of federal shares corresponded to a 27% share of 'outside directors' in the supervisory board, KLM (1995: 5) does the same in its 1994/95 annual report, stating that "*Pursuant to Article 20, paragraph 13, of the Articles of Association, the State of The Netherlands appoints the smallest possible majority of the members of the Supervisory Board.*"

Available Rents

This is the first variable in line with the structure-performance approach of industrial organization. A common operationalization of *available rents* is the regulative environment of firms or government purchases.³²

It is difficult to determine government purchases in the airline industry and the regulative environment is formally the same within the European common market. While these specific operationalizations are therefore not applicable to the airline case, the underlying logic remains valid: airline officials assess their chances of receiving protection before engaging in political activity.

The overall level of state aid spent in all sectors is used to identify a certain attitude the governments has concerning support of their industries. When facing a crisis, airline officials assess the benefits of engaging in rent-seeking activities by comparing the situation to other industries that have been supported. The pooled overall national state aid from 1994-1996 as percentage of GDP accounts for *available rents*. It stems from the “Eighth Survey on State Aid in the European Union” (Commission 2000a).

Free Rider Problem: Market Concentration

Corporations are political influential if they overcome a free-rider problem of lobbying activities. The free-rider incentives are lowest for individual airlines in highly concentrated markets, i.e. when one airline accounts for most of the output. The market share is defined as the relative share in total market output. Salamon and Siegfried (1977) and Grier et al. (1991) determine the level of concentration by means of the four-firm concentration ratio – that is – only market shares of the four largest firms are included. Pittman (1988: 176) recodes the concentration index to a dummy variable with industries labeled “concentrated” above the median value of 40 percent. Esty and Caves (1983: 30) use the squared value of the four-firm concentration ratio.

While all of these measures use firms’ output or sales to determine market shares and concentration levels, the question arises what constitutes “output” in the airline industry. I decided to use annually scheduled passengers as output and market size measure. First,

³² As for instance the US defense industry. See for e.g. Andres (1985), Grier, Munger, and Roberts (1994) or Hansen and Mitchell (2000)

general traffic data is available for every airline by region and country (ICAO 1995). Second, the object of investigation is passenger traffic exclusively. Using passenger figures excludes other airline branches such as air cargo. Although this measure neglects different route structures and pricing methods of the airlines³³, passenger data is widely available and comparable across countries and airlines.

The present operationalization of *concentration* further deviates from prior industrial organization approaches with respect to the concentration ratio. I compute the Herfindahlindex of concentration by summed squares of individual airline market shares. This includes all airlines listed in the “Civil Aviation Statistics of the World” 1994 (ICAO 1995) with more than 20.000 scheduled passengers in 1994 and provides for possible effects by small and potential competitors to national airlines.³⁴

The domestic market share is computed by dividing domestic scheduled passengers of an airline by the total domestic scheduled passengers. The problem is thereby, that small countries are excluded from the sample because they simply do not have a domestic market. To solve that problem, I use the airlines’ share in total scheduled passengers of nationally registered airlines. The formulas for market shares and the resulting concentration ratio are shown below:

$$\text{Market Share in 1994: } ms94 = \frac{P_{airline}}{P_{country}}$$

$$\text{Herfindahlindex 1994: } hi94 = \sum_{i=1}^n \left(\frac{P_{airline}}{P_{country}} \right)^2$$

Whereas $P_{airline}$ is the number of annually scheduled passengers of an airline and $P_{country}$ the total number of annual scheduled passengers transported by nationally registered airlines. The resulting Herfindahlindex ranges from 0 to 1, with 1 = *one airline transports all passengers*, and 0 = *all passengers are equally distributed between airlines*, meaning that the level of concentration increases from zero to one.

³³ Fares differ significantly between low-cost and prestigious airlines. The number of passengers transported can therefore not account for differences in quality.

³⁴ The Herfindahlindex of the British airline market decreases from 0,33 to 0,29 when considering all 21 registered airlines instead of only the four largest ones, indicating more precision when considering all airlines.

Firm Size

Public attention focused on airlines increases with airline size – holding its prestige constant. In industrial organization approaches, *firm size* is determined by output or sales.³⁵ Again, I use annually scheduled passengers to measure *firm size* and thereby institutional visibility. An alternative operationalization is the number of employees to determine airline size. I abstain from this operationalization for two reasons. First, it is input oriented and biased by efficiency differentials. Highly subsidized airlines commonly suffer from excess employment (Doganis 2001) and therefore the number of employees does not account for its size compared to less subsidized airlines. Second, the object of research is air *passenger* transportation. Measuring *firm size* with numbers of scheduled passengers excludes other branches of the airline, while differentiation of personnel employed for passenger transport and other sectors is problematic. The data originates from the “Civil Aviation Statistics of the World” (ICAO 1995).

So far I specified factors that are hypothesized to affect the political influence of airlines. I assume that influence is directly transferred into policy outcomes in the form of protection: The explanatory factors affect therefore the level of protection via the intervening and implicit variable of political influence. Before testing this relationship, the dependent variables need to be operationalized.

5.3.3. The Dependent Variables

Within the scope of this analysis I focus on two possible protectionist policies: state aid and control over market entry. Airlines and governments exercise control over entry at capacity constraint national airports through discriminatory slot allocation (*hub dominance*) and *code share agreements*. *State aid* is granted directly to the airline or governments provide airlines with cost advantages at *state owned airports*. The combination of these four indicators accounts for the level of protection from domestic, intra-European and international competition. Each of these indicators is subsequently specified before constructing the protection index on the basis of the single indicators’ summed values.

³⁵ E.g. Hansen and Mitchell (2000: 893) measure size by log dollar sales of a firm.

Hub Dominance

A proxy for flag carriers' slot shares accounts for their *hub dominance* at their two largest home hubs. As Gonenc and Nicoletti (2000: 9) state, "*Anticompetitive business practices often involve the use of 'slot dominance' in an airport to foreclose competitors or raise rival costs on certain routes.*" Their OECD study is exceptional in a sense that they try to demonstrate slot dominance in a quantitative manner. They use data from the "International Regulation Database" (OECD 1998b), including replies to questionnaires concerning the slot distribution at main European hubs in the travel season 1997 in their analysis. Slot share data for my analysis originates from this database, but it contains numerous missing values. I therefore complement slot share figures by other material originating from a report by the OECD (1998a), a report by the Commission (2001a) and from statistical material provided by the national airport coordinators for the 2000 travel season.

The data quality of the *hub dominance* indicator is limited by two factors: time inconsistencies and heterogeneity of sources.³⁶ However, this is not as challenging as it might first appear: *hub dominance* values vary minimal over time because of the grandfather principle. Airlines inherit their slots from year to year. But what does account for the variance in slots are *code share agreements*. Airlines can shift their slots within alliance partners, without losing them to new competitors. The more *code share agreements* an airline practices, the less it has to be concerned with losing slots when not using them. Alliances are not a necessary, but a sufficient condition for these agreements – that is – while airlines possibly practice code sharing with any airline, they will definitely do so with their aligned partners.³⁷ For the given reasons I create a *code share* dummy variable coded 0 for independent airlines and 1 for allied airlines in addition to the *hub dominance* proxy, assuming that code sharing magnifies the slot share problem.

State Aid

As discussed in Chapter 4.2, subsidies distort competition. Within the rational choice approach I argue that the Commission lacks the capabilities to judge if granted *state aid*

³⁶ see Appendix C for details

³⁷ Swiss recently joined the One World alliance around British Airways. One part of the deal was that Swiss clears a majority of its peak time slots at the congested airport London Heathrow for British Airways (Enz 2003).

complies with the rules of the common market. For this reason, public funding under the market investor principle is also classified as *state aid*.³⁸ The data originates from the “Eighth Survey on State Aid in the European Union” (Commission 2000a). This survey contains a statistical overview of subsidies across sectors and industries, but neglects borderline cases that are not clear-cut in terms of compatibility with EC Treaty Law. The detailed decisions and cases on state aid are instead described in the “Commission Reports on Competition Policy” (Commission, several volumes). The Commission data on state aid is consistent with the numbers reported by Doganis (2001: 202).

The modes of payment vary substantially. Some are paid en bloc; others receive their subsidies in annual installments that are connected to restructuring programs. I calculate the annual mean of subsidies received by the airlines between 1994 and 2000 in Euros to balance the different modes of financial transactions. To account for differences in airline size, a ratio of the mean subsidies to mean annual scheduled passengers over the same period is created. The state aid indicator has therefore the formula:

$$sa = \frac{\overline{sub}_{94-00}}{\overline{P}_{94-00}}$$

With *sub* as the amount of subsidies and *P* the annually scheduled passengers. I include airline size because a large airline should be entitled to receive relatively more subsidies than smaller ones. A few airlines score tremendously high values on this ratio: Olympic Airways – the Greek flag carrier – has for instance been subsidized with an average amount of 47 Euros per scheduled passenger between 1994 and 2000 by the Greek government. Figure 2 illustrates the state aid index for the eight countries, which have subsidized their national airline direct or indirect at some point between 1994 and 2000.

³⁸ One example for a government contribution not considered as state aid is an amount of € 800 million transferred to the Lufthansa pension fund from the German government in 1995: “*The Commission considered that a private investor in the same position as the German State, obliged to relinquish the control of Lufthansa, would have acted in the same way in order to maximise the final value of its stake.*” (Commission 1996: 81).

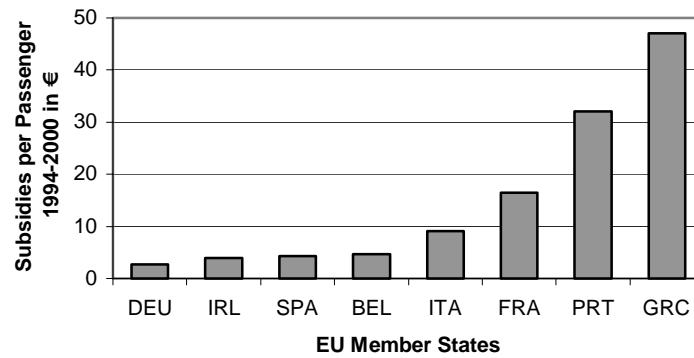


Figure 2 Average annual amount of subsidies per scheduled passenger granted to national airlines between 1994 and 2000 in Euro.

Unfortunately the variable *state aid* does not include cross-subsidies that remain unidentified by the Commission. Even more challenging than identifying cross-subsidies is their quantification. Tax- and cost advantages in the form of tax-free kerosene or low landing fees for incumbent carriers are apparent but not measurable. However, I argue that the likelihood of flag carriers' advantages increases with *state control of airports*, which is specified next.

State Ownership of Airports

In 2002 the European Commission (2002b) published a study conducted by the University of Cranfield, which analyzes competition between airports and the application of state aid rules. This survey includes information on European Airports' ownership structure. These structures are classified by airports' shareholders, which are national governments, regional governments and other state sector institutions, chambers of commerce or private investors.³⁹ As I argue in Chapter 4.2.7, airports partly constitute public infrastructure obligations, guaranteed by regional governments or public sector institutions. Public control of airports is therefore partly justified. For this reason large scale national government equity stakes in airports are likely to distort competition between airlines because they empower governments to support their carriers indirectly. Data for the largest European hubs is available in the above mentioned Cranfield Study. I compute the mean value of national government shares in the largest hubs that are simultaneously capacity constraint and affected by the hub dominance problem.

³⁹ See Appendix F for details on ownership structure.

5.3.4. Creating a Protection Index

The indicators *state ownership of airports* and *state aid* are continuous and interval scaled variables. *Hub dominance* is expressed in percent as well and can formally be interpreted as interval level. However, it was demonstrated that its measurement is imprecise. Therefore it seems appropriate to replace the exact *hub dominance* values by simple ordinal scale. Even if the data is imprecise, an ordinal scale still reflects the levels of *hub dominance* by the respective flag carriers. The *code share* indicator is coded as a dummy variable.

The differing scales of measurement cause a methodological problem in a sense that different statistical methods are required to test the hypothesized relationships, which limits comparability of the results. But more important – none of the indicators forms protectionism by itself. Instead, the *combination* of the single indicators' values determines the level of protection.⁴⁰ Although it poses some problems to transfer the observed empirical relatives into a numerical, ordinal scaled index, I proceed by first scaling each of the indicators individually according to conditions shown in Table 1.

Table 1 Construction of the Protection Index

Indicator / Operationalization	Condition	Label	Value
State Aid (sa) Ratio of received state aid and passengers transported 1994-2000 annual mean in €; value doubled weighted.	if state aid (sa) = 0, then	no subsidies received	0
	$0 < sa \leq 5$	low level of subsidization	2
	$5 < sa \leq 20$	intermediate level of subsidization	4
	$20 < sa \leq 50$	highly subsidized	6
Hub Dominance Estimate (hd) Average slot share of largest national carrier at home hubs between 1997 and 2000 in %.	if $0 < hd \leq 35$, then	no slot dominance, low barrier to entry	1
	$35 < hd \leq 50$	weak slot dominance, moderate barrier to entry	2
	$50 < hd \leq 65$	moderate slot dominance, high barrier to entry	3
	$65 < hd < 80$	strong slot dominance, very high barrier to entry	4
Code Share Agreements (cs) Number of significant European alliance partners of national flag carrier, 2000; dummy variable.	if not aligned, then	occasional practice of code share & slot exchange	0
	if aligned, then	regular practice of code share & slot exchange	1
State Ownership of National Airports (soap) Mean percentage of government shares at largest airports 2000.	if soap = 0, then	sample airports privatized	0
	$0 < soap \leq 50$	government is minor shareholder	1
	$50 < soap \leq 80$	government is major shareholder	2
	$80 < soap \leq 100$	sample airports state-owned	3
Protection Index ; added values; scale 1-14 points	if index value = 1, then	liberal market	
	if index value = 14, then	highly protected market	

⁴⁰ The absence of *hub dominance* is for example a necessary, but not a sufficient conditions for a liberal airline market if the flag carrier is highly subsidized.

The values for *state aid* are double weighted. As I argued, subsidies directly distort competition and are likely to increase the level of protection relatively more than e.g. the airport ownership status. The single indicators' values are added up to the protection index, which ranges from a value of one for liberal airline markets and 14 for highly protectionist airline markets. Protectionism must thereby be understood as a continuous latent variable that is mapped onto the observed, categorized and summed values of the single indicators (Long 1997: 116). Figure 3 illustrates the results.

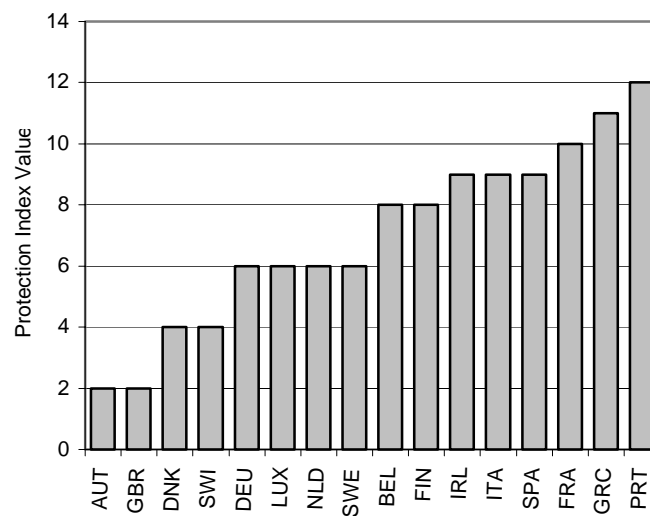


Figure 3 Airline market protection index 2000: summed values of single dependent variables; *state aid* double weighted.

No country reaches the highest possible score of 14 points. Portugal scores highest with 12 points, leading to the conclusion that its airline market is still well protected by the end of the 1990s. Austria's and Great Britain's air transport markets are de facto deregulated, but their flag carriers cooperate with other large carriers in alliances, which accounts for the score of two points. Air France is for example not allied but relatively high subsidized in combination with state owned French airports and hub dominance. Next, I assess the impact of the explanatory factors on the protection index as described above by means of an ordered logit regression model.

5.4. Maximum Likelihood Estimation by Ordered Logit Regression

The dependent variable is an ordinal-scaled index of protectionism in the airline industry of European Union Member States and Switzerland. Ordered categorical dependent variables violate the linearity assumption of linear regression models (Carey 2002: 393). I therefore apply an ordered logit model based on maximum likelihood (ML) estimation. To do so, the dependent variable must be recoded and categorized according to the protection level.

Before proceeding, a difficulty with this method shall be highlighted: as Long (1997: 54) points out “*While ML [Maximum Likelihood] estimates are not necessarily bad estimates in small samples, the small sample behavior of ML estimates (...) is largely unknown*”. In this analysis the sample consists of only 16 observations. Long (1997: 54) proposes a rough estimate of ten observations per variable as a sufficient sample size to obtain robust results for ordered logit models. More observations are needed with collinearity among the independent factors or when the variance of the dependent variable is low (King et al. 1994: 215). No doubt: the small sample is a serious weakness of the model, which should be kept in mind when interpreting the results. To mitigate the problem, the absence of collinearity is ensured and the number of categories of the dependent variable is kept to a maximum to increase variance.

5.4.1. Recoding the Index

The mean value of the index with its 16 observations is 7 with a standard deviation of 3,01 and a range from 2 to 12.⁴¹ The index variable is recoded by creating 6 categories according to the countries’ protection-level *P*. The new variable *cat* (see below) is included in the model as the dependent variable. Category one (*liberalism*) contains cases with widely deregulated airline markets, while category six (*highly protectionist*) includes observations with highly protected markets. The other categories contain the appropriate intermediate stages.⁴²

⁴¹ For illustration see Figure 3 and Table 2.

⁴² cat 2 = *low protectionism*; cat 3 = *moderate protectionism*; cat 4 = *intermediate protectionism*; cat 5 = *protectionism*

$$cat = \begin{cases} 1 & \text{if } 0 \leq P \leq 2 \\ 2 & \text{if } 2 < P \leq 4 \\ 3 & \text{if } 4 < P \leq 6 \\ 4 & \text{if } 6 < P \leq 8 \\ 5 & \text{if } 8 < P \leq 10 \\ 6 & \text{if } 10 < P \leq 12 \end{cases}$$

Although less than six categories would be sufficient to express a certain protectionist level, the six categories guarantee the variance required by the statistical model to reach maximum likelihood convergence. Fewer categories in combination with the small sample limit the explanatory power of the results.

5.4.2. Descriptive Statistics

The summed statistics in Table 2 include the four single protection policy indicators, the index and the recoded index with six categories for the maximum likelihood estimation. Data on *hub dominance* is unavailable for Ireland and Luxembourg. Since the sample is small, I replace the two missing values by the sample mean of 51.6 percent to obtain results for all cases. This approach is justifiable for two reasons. First, the low standard deviation of .148 reported for *hub dominance* illustrates that the majority of the cases is close to the sample mean. Second, this indicator is only assumed to be a rough estimate for the true slot allocation since data quality is poor. It is likely that the two missing values do indeed approximate close to 50 percent.

Table 2 Summed Statistics of Dependent Variables

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Hub Dominance (%)	16	.516	.148	.13	.8
State Ownership Airports (%)	16	.594	.432	0	1
Code Share (dummy)	16	.813	.403	0	1
State Aid (€/Passenger)	16	7.508	13.543	0	47.05
Index	16	7	3.012	2	12
Index Category	16	3.625	1.628	1	6

The important indicator *state aid*, measured in Euro per passenger transported in the annual mean of 1994-2000 includes one outlier, which is Greece with an average amount of 47 Euros subsidized on every transported passenger. For eight observations no subsidies could be identified leading to a value of zero. Therefore, the relatively high mean value and the standard deviation are based on the highly subsidized countries Greece and Portugal.

Table 3 reports the summed statistics for the explanatory variables. The mean value of the Herfindahl index of *concentration* (.71) shows that on average the European national airline markets are densely concentrated, not leaving much room for competition. The UK accounts for the minimum of .29 with 21 registered airlines sharing total traffic. The maximum of 1 is reported for Luxembourg, which indicates that Lux Air is the only registered domestic airline. Only 9 observations can be made for *outside directors* due to data limitations. Among these 9 cases, an average of 34 percent of total directors of European flag carriers are public officials. To curb the effects of the large figures of *GDP* and *firm size* I use the natural logarithm for these two variables. One missing value of the *available rents* variable is replaced by the sample mean (1.082) for Switzerland, for which general state aid figures are not included in the Commission (2000b) state aid report.

Table 3 Summed Statistics of Independent Variables

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Concentration (Herfindahl Index)	16	.710	.215	.290	1
State Ownership (%)	16	.567	.352	0	1
Outside Directors (% of total directors)	9	.336	.175	.09	.56
ln of Firm Size (total annual passengers)	16	15.734	1.031	13.186	17.215
Available Rents (total state aid as % of GDP)	16	1.082	.418	.5	1.97
Budget Deficit (% of GDP)	16	-5.472	4.295	-13.708	.533
Relative Market Size (Size/Population)	16	.804	.363	.398	1.352
ln of GDP/Capita	16	9.844	.231	9.440	10.322

Table 4 shows the correlation matrix with Pearson's *r* coefficients for the independent variables. According to Agresti and Finlay (1997: 542), identifying and removing "...those variables that explain a small portion of the remaining unexplained

variation in Y...” is a remedial action for collinearity. That is, removing highly correlated variables reduces the risk of collinearity. With a small sample size one should try to avoid collinearity since it weakens the explanatory power of the results.

Table 4 Correlation Matrix for Independent Factors

	Concen- -tration	State Owner- -ship	Outside Directors	Log of Firm Size	Available Rents	Budget Deficit	Relative Market Size	Log of GDP/ Capita
Concen- -tration	1.000							
State Ownership	-0.006	1.000						
Outside Directors	0.369	0.796	1.000					
Log of Firm Size	-0.077	-0.180	-0.133	1.000				
Available Rents	0.457	0.093	-0.013	0.487	1.000			
Budget Deficit	0.335	-0.206	0.051	0.258	0.336	1.000		
Relative Market Size	0.119	-0.549	-0.461	-0.130	-0.306	-0.189	1.000	
Log of GDP/Capita	0.510	-0.632	-0.389	-0.205	0.138	0.531	0.354	1.000

As expected the correlation coefficient of *state ownership* and *outside directors* is high (.8). Obviously, the more shares a government holds in its airline, the more public officials are employed, or vice versa. *State ownership* will therefore account for both variables in the model.

Further, *relative market size* and *GDP* correlate negatively with *state ownership*, and *GDP* positively with *budget deficit* and *concentration*. These coefficients oscillate between values of .5 and .64. According to Schnell et al. (1999: 154) variables with a Pearson's *r* of at least .8 indicate a high correlation. Values above .5 indicate a tendency towards correlations and must therefore be kept in mind for later analyses.

5.4.3. Ordered Logit Regression Results

Table 5 displays the regression results of the ordered logit regression. The dependent variable of all three models is the protection index with its six categories ranging from liberal to highly protectionist markets.

Table 5 Ologit Regression Results

Explanatory Variables	Dependent Variable: Protection Index Categories (cat)					
	Model 1		Model 2		Model 3	
	ML Estimates	\sqrt{VIF}	ML Estimates	\sqrt{VIF}	ML Estimates	\sqrt{VIF}
Concentration (hi94)	12.986 (1.77)*	1.509	12.533 (1.76)*	1.508	9.096 (1.49)	1.496
State Ownership (so95)	21.137 (2.09)**	1.642	17.895 (2.33)**	1.640	13.140 (2.39)**	1.635
Log of Firm Size (lnfsi94)	-2.976 (1.34)	1.579	-1.684 (1.24)	1.577	-0.906 (0.82)	1.575
Available Rents (sa9496)	10.154 (1.76)*	1.705	7.503 (1.75)*	1.703	3.479 (1.27)	1.587
Log of GDP/Capita (lngdp)	-40.590 (1.82)*	1.657	-25.261 (2.04)**	1.567	-13.973 (1.91)*	1.545
Relative Market Size (remsi94)	8.111 (1.60)	1.276	5.241 (1.49)	1.272		
Budget Deficit (bd94)	0.327 (0.90)	1.155				
N	16		16		16	
Maximum Likelihood Iterations	9		8		7	
LR χ^2	38.20		37.36		34.78	
prob > χ^2	0.000		0.000		0.000	
McFadden's Pseudo R ²	0.689		0.674		0.627	
McKelvey and Zavoina's R ²	0.987		0.977		0.951	

Figures are maximum likelihood estimates with absolute value of z statistics in parentheses and the square roots of the variance inflation factors.
* significant at 10%; ** significant at 5%; ***significant at 1%

The coefficients in Table 5 are maximum likelihood (ML) estimates complemented by the square roots of the variance inflation factors (VIF), estimated by regressing each of the independent variables by linear OLS regressions.⁴³ The *VIF* serves to ensure the absence of collinearity among the independent variables, which would weaken the

⁴³ Fox (1991: 11) recommends using the square root of the VIF in preference to the VIF itself "...because the precision of estimation of β_j is most naturally expressed as the width of the confidence interval for this parameter, and because the width of the confidence interval is proportional to the standard error of b_j ...".

explanatory power of the results. Fox (1991: 13) states that square root values of the *VIF* below a threshold of two⁴⁴ are acceptable to assume absence of collinearity.⁴⁵

Model 1

The first Model contains all explanatory variables and control variables. The variables show the expected signs except for *firm size*, which is also statistically insignificant along with *budget deficit* and *relative market size*. *State ownership* is statistically significant at the 5 percent level, the remaining factors reflect tendencies because of the 10 percent level. Nine iterations are needed to reach ML convergence, which indicates that the search space is problematic (Kohler and Kreuter 2001: 271). Besides a lack of variance on the dependent variable, a second reason for convergence problems is the number of independent variables in relation to a small sample. Deleting irrelevant variables from a model and reducing thereby the number of variables can be a solution to this problem.

To evaluate the model fit, I follow Long and Freese (2001: 148) using McKelvey and Zavoina's R^2 since it is comparable to the R^2 obtained in linear regression models and a superior measure to the standard McFadden's Pseudo R^2 . Interpreting the R^2 of Model 1 analogous to linear regressions would lead to the conclusion that the explanatory factors do indeed explain 99 percent of the protection variance – but I would like to refer back to my earlier warning: while it is tempting to claim a good fit of the model, there is no guarantee for it because of the small N.

The values of the square root *VIF*, which remain below 2, demonstrate the absence of collinearity. Since *budget deficit* does not seem to affect the dependent variable at all, and since a reduction of variables might improve ML convergence, *budget deficit* is excluded from Model 2.

Model 2 and Model 3

Dropping *budget deficit* does neither change signs nor significance of the coefficients except for *GDP*, for which significance increases to the 5 percent level. McKelvey and Zavoina's R^2 decreases slightly, but remains at a high level. ML convergence improves

⁴⁴ Which corresponds roughly to a R^2 value of .7 in the linear regression.

⁴⁵ According to Fox (1991: 11), imprecise estimates are more frequently the product of small samples and a lack of variance than of serious collinearity.

to 8 iterations when dropping one variable. I repeat the procedure of dropping one control variable to improve ML convergence. *Relative market size* is statistically insignificant and shows the smallest ML estimate. It is therefore excluded from Model 3. But although *relative market size* is statistically not significant in Model 2, two variables lose significance when dropping it in Model 3. It therefore seems to impact Model 2 despite its insignificant results. For further analysis I focus on Model 2 since it appears to have the most explanatory power.

The tests of the ML coefficients are evaluated with the z-statistics in parentheses (Table 5). Kohler and Kreuter (2001: 286) emphasize that Likelihood Ratio (LR) tests are more reliable than the standard z-statistics for the single coefficients. I evaluate each of the coefficients in Model 2 with LR tests respectively. As a result, significance increases to the 5 percent level for *concentration* and *available rents*, and to the 1 percent level for *state ownership* and *GDP*.

So far, the results can be summarized as follows:

The main variables *concentration*, *state ownership* and *available rents* affect the level of protection positively as hypothesized. *Firm size* affects the dependent variable negatively and falls therefore short of my expectations. The control variable *GDP* has a negative impact on the level of protection in line with the theoretical considerations and *relative market size* has no effect.

Unfortunately, it poses a problem to infer the magnitude of the variables' impact from the coefficients because they are maximum likelihood estimates. Concluding that the log likelihood for protection increases by 17.895 with a 1 percent increase in state ownership is not quite satisfying. I hence compute and graphically present predicted probabilities for the dependent variable with changing values of the three main and significant variables *concentration*, *state ownership* and *available rents* respectively. For illustration purposes, I choose three exemplary categories from the dependent variable. The subsequent figures therefore represent changing probabilities for *liberalism (cat 1)*, *moderate protectionism (cat 3)* and *protectionism (cat 5)*, caused by changing values of the independent variables, holding the other factors constant.⁴⁶

⁴⁶ Graphing all six categories would offer the full picture at the expense of clarity. I prefer the exemplary chosen categories for simplicity reasons instead of including six confusing curves into the graph.

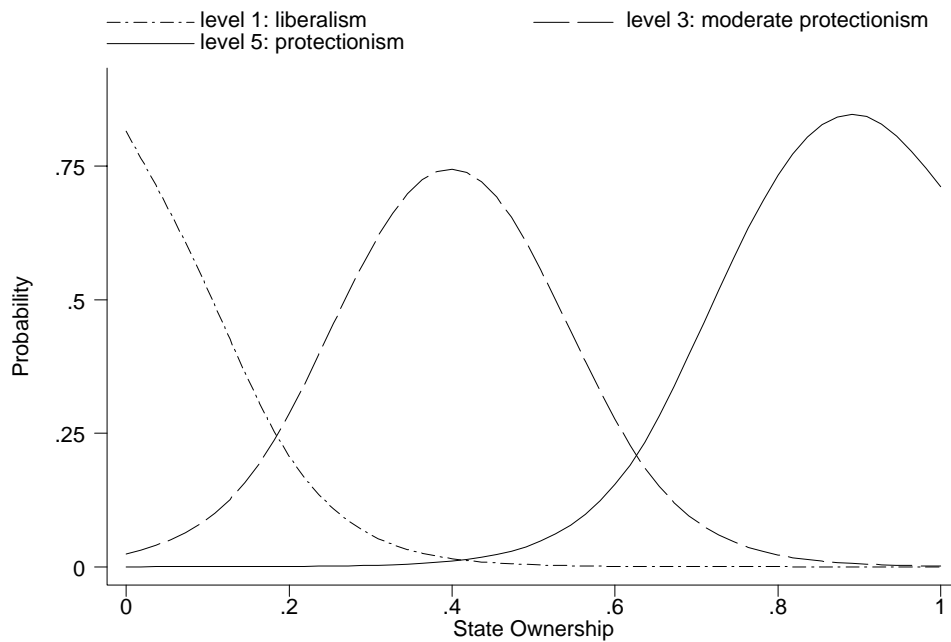


Figure 4 Predicted probabilities of protection levels for changing values of governmental equity stakes in national flag carriers (state ownership) in % (from Model 2), holding all other factors constant.

Figure 4 illustrates how the probability for *protectionism* increases with rising government shares from 40 percent to 90 percent. The probability increases particularly steep when government shares exceed the majority threshold of 50 percent, but drops back from 90 to 100 percent. The inverted relationship applies to the probability for a liberal airline market (*liberalism*). It is highest for privatized airlines and drops with an increase in shares up to approximately 50 percent. Therefore, the likelihood to obtain a liberal airline market remains zero in sample countries where governments hold a majority share in its flag carrier, whereas the probability for protectionism increases above a *state ownership* level of 50 percent.

The value for the probability of *moderate protectionism* is highest when the other categories reach a likelihood value of zero, which corresponds to *state ownership* of 40 percent. The likelihood for *moderate protectionism* increases when *liberalism* decreases and drops when *protectionism* increases.

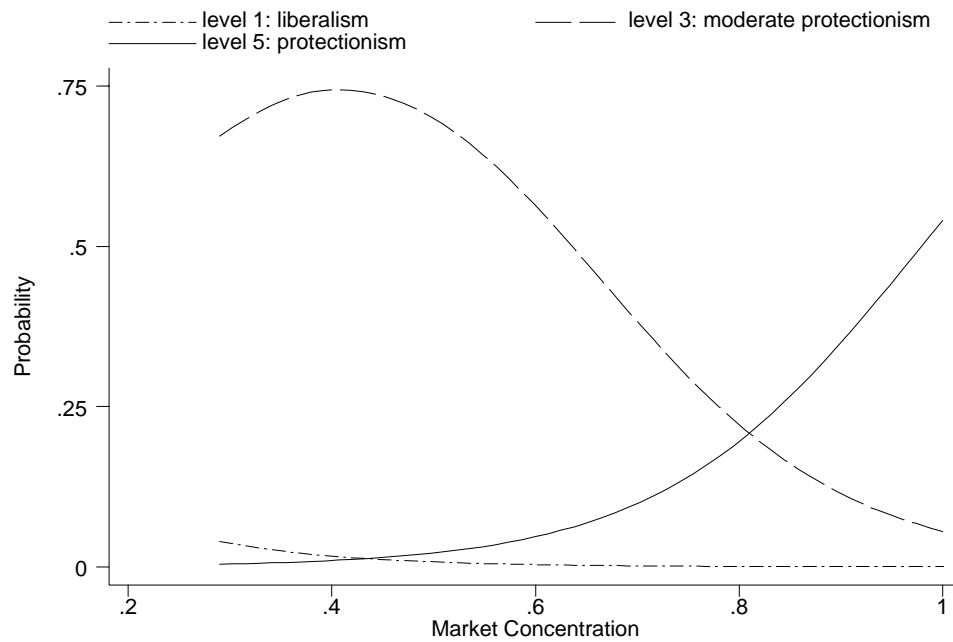


Figure 5 Predicted probabilities of protection levels for changing values of national airline market concentration ratios (from Model 2), holding all other factors constant.

Figure 5 displays the predicted probabilities for changing values of *concentration*. The visible result concerning *protectionism* probabilities are analogous to Figure 4 with a disproportionate rising likelihood for protected markets with increasing values of the concentration ratio, particularly when exceeding a concentration threshold of roughly 0.7. This implicates that the probability for protected markets of the sample countries in the past-deregulation period is indeed affected by high concentration ratios of their airline markets in the early 1990s. While the likelihood for *moderate protectionism* decreases with rising concentration values, the probability for liberal markets decreases minimal but basically remains zero and unaffected, which renders inference from this category impossible.

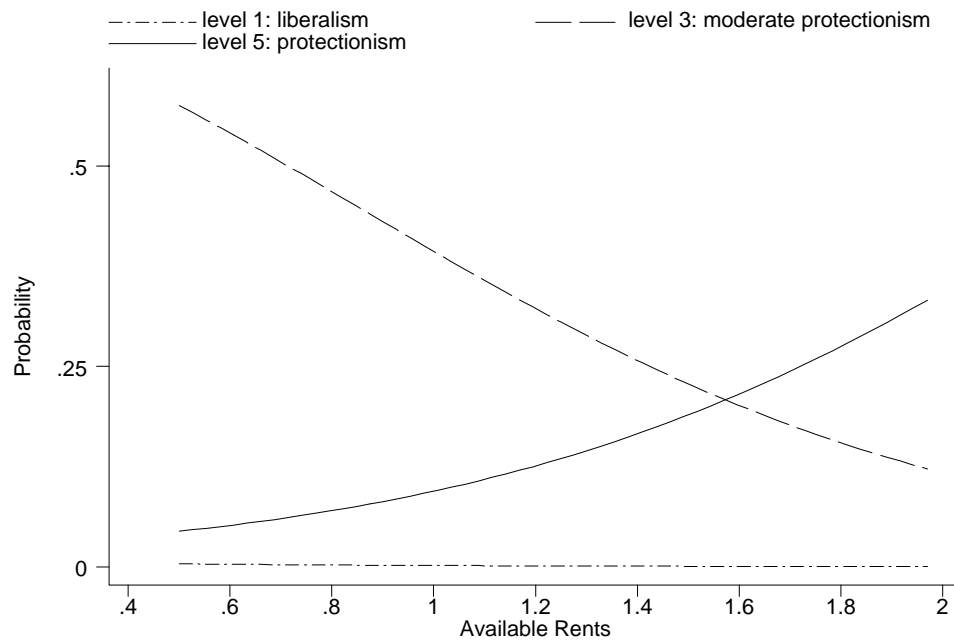


Figure 6 Predicted probabilities of protection levels for changing values of national available rents (from Model 2), holding all other factors constant.

Figure 6 depicts probabilities for changing values of the last variable taken into closer consideration: *available rents*. The pattern is similar to changing probabilities for market concentration. However, in contrast to the curve-linear developments of the earlier variables the relationship is here almost linear. The protection level does indeed depend on general national state habits: the more rents available in a market economy in the form of subsidies, the higher is the level of flag carrier protection. Analogous to *concentration*, the variable *available rents* does not have any impact on probabilities for *liberalism*, which remain at a constant level of zero.

For all three variables, the hypothesized effects are visible for the fifth category of the dependent variable, which is labeled *protectionism*. I summarize the three effects for a better comparison in Figure 7.

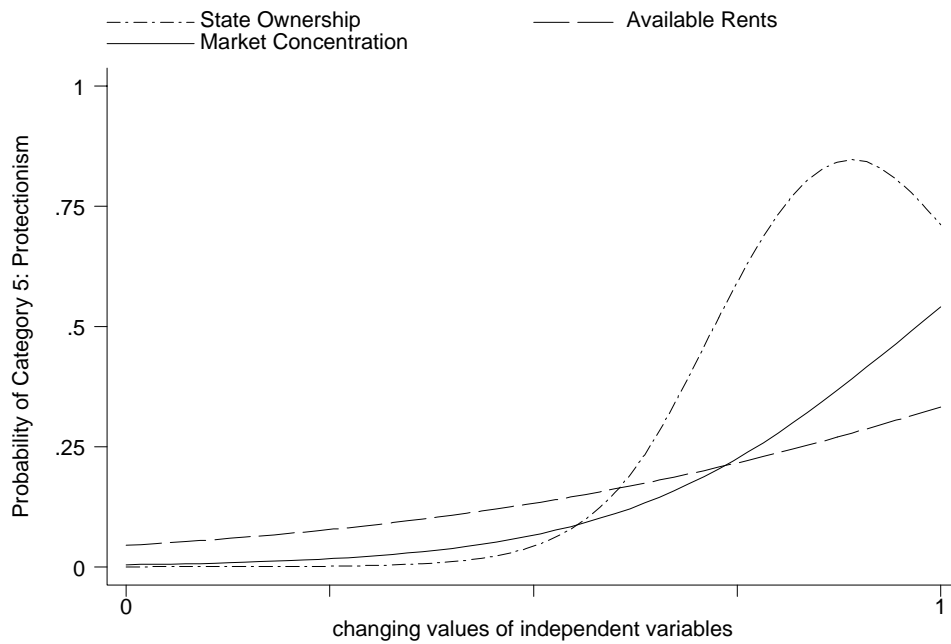


Figure 7 Predicted probabilities of category 5 of the protection index for changing values of main independent variables (from Model 2), holding all other factors constant.

Figure 7 displays the curves for the fifth index category (*protectionism*) exclusively. The curves represent the three independent variables.⁴⁷ *State ownership* and *concentration* have a stronger impact than *available rents*, but only from a threshold of roughly 50 percent, while the *available rents* curve is almost linear. These results are now discussed against the theoretical background.

5.4.4. Discussion of the Results

Before proceeding in discussing each of the hypotheses respectively, some thoughts concerning the control variables seem to be necessary. *GDP* was shown to have a large impact on the dependent variable. *GDP per Capita* was included in the analysis to account for differences in wealth among the EU countries, assuming that poorer regions lack air transport demand but face public service obligations and depend therefore on government support. The comparatively large impact is caused by the Mediterranean EU countries in the sample, which are relatively poor in terms of *GDP per Capita* and score high on the dependent variable. The laggard European countries face a

⁴⁷ Note that the x-scale does not represent true values of the variables in Figure 6. I fitted the curves to a common scale for a better comparison of the effects.

competitive disadvantage within the EU common aviation policy compared to the large markets in western and northern Europe. Previous analyses of EU deregulation have not accounted for such a north-south cleavage (e.g. Button 1996; Marín 1995).

The ML coefficient for *relative market size* is not significant and considerably small. Nevertheless it is positive, suggesting that there is a tendency that countries that depend on international airline markets receive more protection than countries with a small passenger – population ratio. This relationship remains speculative and renders further inference impossible. I proceed with focusing on the individual hypotheses of the main variables.

H1: The higher the concentration of the national airline market, the higher the protection level.

As was shown, *concentration* has indeed a positive and statistically significant impact on the index categories of the dependent variable. This result is not comparable to earlier approaches of industrial organization since I use a different operationalization. My analysis focuses on one service sector across 16 countries in contrast to the US studies across industries as conducted by Andres (1985), Esty and Caves (1983), Grier et al. (1991) or Zardkoohi (1988). Second, I link political outcome in the form of protectionism directly to the structure variable, skipping the intervening variable of political activity due to data unavailability. This is in line with Salamon and Siegfried (1977), who conduct a test of the impact of concentration on a “Tax Avoidance Rate” across 110 industries in the US and find a negative relationship between *concentration* and *protection* in contrast to my result. The implication for the airline industry is that dominant flag carriers in highly concentrated airline markets in 1994 were sufficiently influential to receive further protection in the formally deregulated aviation sector at the end of the 1990s.

H2: The stronger the institutional visibility of an airline, the higher the protection level.

Institutional visibility is determined by *firm size*. The ML coefficient of the natural logarithm of *firm size* is negative, relatively small and statistically not significant. The hypothesis must therefore be rejected on the ground of the result. Surprisingly this result contradicts the findings for the market concentration ratio. A higher *concentration* value also expresses average firm size within a market, holding the size of the market

constant. High levels of market concentration do thereby always indicate large average size of the firms within the market. This hinders towards an operationalization problem of the *firm size* variable, rather than to a theoretical misconception. The variable reflects the total number of scheduled passengers per airline, which accounts for an absolute *European* value of institutional visibility. Alternatively, one could put firm size in relation to country size, which would then account for the *national* level of institutional visibility.

H3: *The higher the state ownership level of an airline, the higher the protection level.*

State ownership is the most influential variable within Model 2. The relationship between government equity stakes and protectionism is confirmed by the relatively large, positive and statistically significant ML coefficient. The predicted probabilities for protectionism further demonstrate that especially majority shares explain high protection levels.⁴⁸ This confirms the assumptions that a “*golden share*” (Doganis 2001: 198) enables governments to intervene into the airline. Majority shares in airlines are what foster protectionism – at least within the scope of this analysis. This relationship is closely connected to the fourth hypothesis.

H4: *The more outside directors employed in an airline, the higher the protection level.*

While majority shares guarantee governments control over the airline as described above, they decrease flag carriers’ lobbying costs simultaneously through the possibility of intra-firm lobbying. On the basis of principal-agent considerations, the number of *outside directors* increases with *state ownership*. Besides the theoretical derivation, this relationship has been confirmed with a high correlation coefficient. Political influence increases disproportionate with the number of outside directors: the more outside directors employed, the more homogenous are the interests represented at the firm’s board of directors, the lower are information costs and free-rider incentives, the cheaper is intra-firm lobbying and the higher is the level of protection.⁴⁹ On these grounds, both

⁴⁸ The question remains why the probability for protection drops above a state ownership level of 90%? This is probably caused by the cases contained in category 5: Flag carriers in Italy, Ireland and Spain are state owned, but do not score the highest values on the protection index.

⁴⁹ Results of OLS regressions of the single protection indicators *hub dominance*, *state aid* and *ownership of airports* on the main explanatory variables confirm that *concentration* and *state ownership* are influential. While *state ownership* has a positive and significant impact on *state aid* and *airport ownership*, *concentration* positively affects *hub dominance* at airports. Both are plausible results: the former independent variable explains financial relations between governments and airlines, the latter

hypotheses are confirmed by the results of the *state ownership*, which substantially reflects a certain closeness of government and airline.

H5: *The larger the amount of available rents in a country, the higher the protection level.*

The ML coefficient for *available rents* is positive and statistically significant at the 5 percent level according to the Likelihood Ratio Test for single coefficients, which confirms the hypothesis. This result is not surprising, since there is no reason to expect that general state aid attitudes of European governments should not apply to the airline industry. The importance lies in the mechanism within my framework: corporate airline actors consider general governmental state aid habits in their cost benefit analyses before engaging in costly lobbying activities. If subsidies to other industry sectors are high, they will lobby for a part of it. I offer an improvement to earlier operationalizations in industrial organizations, where this variable was coded as a simple dummy variable for an industries regulative environment (e.g. Pittman 1988, or Hansen and Mitchell 2000).

5.4.5. Generalizability

Last but not least a few general notes on limited generalizations of the results seem necessary. First, it is generally difficult to test lobbying activities in a quantitative manner since homogenous data is rare. Results of my analysis suffer particularly from heterogeneous data quality and small sample size. Due to these methodological problems the results are sample specific.

Second, generalizations are naturally limited by the sample. One of my *ceteris paribus* assumptions is that all countries face the same conditions within the European common market and the common aviation policy. Such a (de-) regulative framework within the EU is unique and hence the findings are not applicable to other countries where these conditions are not given.

explains the structural relation between market concentration and concentration at airports. For regression coefficients see Appendix G.

Besides these deficiencies, important implications can be derived from my analysis concerning previously monopolistic network or transport sectors, which are now subject to deregulation. Before concluding, I exemplarily illustrate the major results and their implications for the liberalization of the EU airline industry.

6. Illustration and Implication of Results

The protection index reveals severe obstacles to a liberal airline market within the European Union, although it excludes numerous competition distorting mechanisms such as tax advantages, hidden subsidies and pricing policies of national flag carriers. Protection of flag carriers' dominant market positions hampers conditions for contestable airline markets. The disadvantaged consumer bears the higher prices caused by airlines' inefficiencies, which in turn result partly from government intervention. *State aid* and *hub dominance* remain obstacles to deregulation, particularly when they are influenced by *state ownership*. The interconnectivity of these factors remains relevant to date.

6.1. State Ownership and State Aid

In Chapter 4.2.4. I outlined the Commission's lack of information and authority to identify and sanction state aid measures, which is confirmed by Rogalla and Schweren (1994: 42). They point out that state aid rules can easily be circumvented. State ownership is neither a necessary, nor a sufficient condition for the subsidization of carriers, but the likelihood for airlines to receive protectionist measures – and thereby state aid – increases drastically when governments are the majority shareholders. State aid is the result of state owned and politically influential airlines. Monitoring state aid is hence a second-best solution to increase competition among European airlines. Instead, competition distorting subsidies become very unlikely with the privatization of airlines. It seems that the privatization of airlines is the only means to achieve a competitive European airline market on the long run.

In 1993, Air France had for instance announced that it aims at privatization by 1995 (Rogalla and Schweren 1994: 34). My data reveals that the French government still holds 56 percent shares in Air France in 2000.⁵⁰ This illustrates my assumption that airlines need the political influence connected to state ownership to survive with increasing potential competition. Concerning the most protected airlines, the obstacle to competition is therefore not solely the high amount of subsidies, which have been

⁵⁰ See Figure 1, page 34 for details.

granted. The obstacle is the government as majority shareholder, which enables the airlines to easily lobby for state aid at any time.

State aid as well as state ownership figures are biased towards the Mediterranean countries. Within the scope of the analysis, I argue that those flag carriers lack the necessary demand for scheduled domestic and intra-European routes because people cannot afford to fly, which results in strong political activity and influence. The *GDP per Capita* variable confirms this. Additionally, these airlines need support because they face geographical competitive disadvantages compared to northern Europe. Great Britain, Germany and the Scandinavian countries have for instance access to profitable international transatlantic gateway traffic to the US (Doganis 2001). Mediterranean flag carriers do not only lack this market capacity, but additionally they have to compete with non-scheduled charter airlines on the intra-European north-south axis (Lopez Sanz 1994: 16). While this is not a justification for state ownership, it explains the north-south cleavage of the liberalization progress.

6.2. Hub Dominance: Delaying the Reform of Grandfather Rights

The discriminatory slot allocation at major European hubs (*hub dominance*) was identified as significant barrier to entry. Council Regulation 95/93 contains the rules for the slot allocation process, among which the grandfather rights are heavily disputed. Scholars commonly agree that this regulation needs to be reformed (e.g. Ewers 2001; Gischer 1996; Starkie 1998) by replacing grandfather rights partly through pricing mechanisms, e.g. in the form of slot auctions. The Commission (2001b: 3) is aware of the discriminatory nature of the current procedure as well as of its blurry legal foundation. The pure numbers of the hub dominance indicator are self-evident: within the sample of 16 European countries, flag carriers dominate their national hubs with an average 52 percent share in total available slots.⁵¹ If the need for reform is so prevalent, why has it been delayed for such a long time?

Grandfather rights mainly exist to the advantage of national airlines because they guarantee airlines continuity of historically given dominant positions. European national

⁵¹ See summed statistics in Table 2, page 56.

flag carriers are represented by the Association of European Airlines (AEA) at the European level. In 2001, the Commission (2001b) proposed technical as well as political changes concerning market access of Council Regulation 95/93. The reaction of the AEA to this proposal indicates that national flag carriers – represented by the AEA – lobby for the delay of substantial reforms:

“The problem with the Commission’s proposal is that it contains, in addition to these practical elements, a number of important policy measures that would bring about major changes in the existing slot allocation system with significant implications for the airline industry. These measures include, contrary to the Commission’s explanatory statement, also certain market access related measures.(...) For the AEA airlines, which operate the major part of the Community’s air transport system and depend entirely on slots at their increasingly congested hub airports, unduly burdensome slot rules affecting their operations are a matter of very serious concern.” (AEA 2001b: 1).

Market access related measures aim thereby at a revision and enforcement of the *new entrant rule*, which is ought to supply new competitors with slots from the pool of unoccupied slot at airport hubs.

Airport operators are represented by the Airport Council International EUROPE (ACI EUROPE), which also reacted to the above-mentioned Commission proposal as well as to its amended version (COM(2002) 623). The ACI points out that *“...the priority given to new entrants in the existing Regulation has brought only very limited benefit to consumers”* (ACI 2003: 1). ACI hence proposes that the new entrants rule should be completely replaced in a new Regulation by an *“effective competition rule, which would also serve to maximize the use of scarce airport capacity.”* (Ibid). On these grounds, *“ACI EUROPE is committed to fully co-operating with the European Commission as it undertakes its work on these aspects of slot allocation”* (Ibid).

These exemplary chosen positions demonstrate that the reform is in progress, but decelerated by powerful European interests. While flag carriers do not want to abstain from their flag privileges offered by the current Regulation, airports – represented by the ACI – aim at a more efficient use of scarce airport capacities. In addition to the interests, one further aspect slows down the reform process: the ACI highlights that

substantial changes of the system should be retained, until “...*the implications of market mechanisms for slot allocation are fully understood*” (ACI 2003: 1). This hints to the complexity of the regulation involved and to further research which is needed to find a pareto-optimal solution for all parties involved: Member States, their flag carriers, regional and low-cost airlines as well as airport operators.

7. Conclusion

This thesis analyzed the gap between de jure and de facto deregulation of the European Union airline industry. I hypothesized that this gap depends upon the political influence of individual airlines, which lobby for protectionist policies regardless of the legal framework of the EU common aviation and competition policy.

Previous research *focused* on economic consequences of monopolistic airline markets (e.g. Doganis 2001; Button 1996; Good et al. 1993), on welfare aspects (e.g. Marín 1995; Graham et al. 1983) and political emergence of deregulation (e.g. Travis 2001; O'Reilly and Stone Sweet 1997), or on specific remaining obstacles to competitive markets (e.g. Ewers 2001; Starkie 1998; Gischer 1996).

Previous research *neglected* why special interest groups – identified as national flag carriers – still favor these remaining obstacles, and how they manage to ensure the persistence of reform obstacles. I bridge this gap on the grounds of the structure-performance approach of industrial organization, which identifies market and firm attributes as indirect estimates for an airline's political influence. It was hypothesized that the protection level of national airline industries depends on the political influence of national carriers.

The results suggest, first, that state owned airlines, in which governments hold majority equity stakes, as well as airlines from previously concentrated markets are sufficiently influential to obtain further protection from domestic and intra-European competition. The liberalization of the European airline industry is – 10 years after the implementation of the “Third Liberalization Package” – still in its infancy. As long as governments hold majority shares in national airlines, no one can guarantee the absence of subsidies and market entry barriers, even with close monitoring by the European Commission. The only possibility of interrupting constant protection seems to be the privatization of state owned airlines.

Second, the overall amount of available rents within an economy positively affects the level of protection in the national airline industry. The demand for protection is thereby simply determined by its supply in the form of subsidies. Airlines, which realize that

other national sectors and industries are highly subsidized, increase their lobbying activities to get a piece of the cake.

Third, the data presented reveals a north-south protection cleavage among EU Member States. The Mediterranean flag carriers depend on relatively more government protection because they relatively lack demand for scheduled flights. Additionally, they have to compete with charter airlines on the European north-south axis and are geographically disadvantaged in terms of access to profitable transatlantic services to North America.

The analysis is limited by data unavailability concerning lobbying activity and political influence. Lobbying processes in the European Union and its Member States are widely informal and difficult to measure. Even if one succeeds to prove some form of lobbying, it remains uncertain if this activity mounts into increased political influence. I circumvented this problem by indirectly measuring political influence with structural attributes of airlines.

The results cannot be generalized beyond the European Union because of the unique legal framework conditions of the common aviation policy. To shed light on the question if special interests generally hamper liberalization processes in service sectors, further research can identify if other previously regulated sectors follow similar protection patterns. This could especially be promising in combination with better measurements of corporate political influence. My indirect measurement remains a second-best solution to capture corporations' and interest groups' political influence. Further research needs do be done in this field to understand and explain lobbying processes and their impact.

Last but not least, international air transport liberalization is hindered by bilateral route and service agreements. The sector has been – and still is – widely excluded from negotiations under the General Agreement on Trade in Services (GATS) of the WTO. Currently, the Air Transport Annex of the GATS includes aircraft repair and maintenance; the selling and marketing of air services and computer reservations systems (WTO n.d.). It excludes traffic rights, which could account for the liberalization of bilateral agreements. As Abeyratne (2001: 1143) points out “*There has been*

sustained interest in the world of commerce aimed at bringing international air services within GATS under the umbrella of the GATT.” Further research should monitor these developments and investigate if national special interests foster or impede the implementation of a GATS-governed market access system in international air transport.

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Appendix

Appendix A: Country Codes and National Airlines

Country Code	Country	National Flag Carrier
AUT	Austria	Austrian Airlines
BEL	Belgium	Sabena (until 2001)
DEU	Germany	Lufthansa
DNK	Denmark	SAS Denmark
FIN	Finland	Finnair
FRA	France	Air France
GBR	The United Kingdom	British Airways
GRC	Greece	Olympic Airways
IRL	Ireland	Aer Lingus
ITA	Italy	Alitalia
LUX	Luxembourg	Lux Air
NLD	The Netherlands	KLM
PRT	Portugal	TAP Air Portugal
SPA	Spain	Iberia
SWE	Sweden	SAS Sweden
SWI	Switzerland	Swissair (until 2001)

Appendix B: Operating Rights of Freedom

Regulation of international air transport is based on these operating rights of freedom:

1. Innocent passage: the right to fly over another state.
2. Technical stop: the right to stop for repairs or refueling.
3. The right to take passengers and cargo from the airline's country of origin to another state.
4. The right to pick up passengers and cargo in another state and bring them to the airline's country of origin.
5. The right to pick up passengers and cargo in another country and carry them to destinations other than the airline's country of origin.
6. The right to pick up passengers and cargo in one state, bring them to the airline's country of origin and transfer them to flights for foreign destinations (gateway traffic).
7. The right to carry passengers and cargo between two states, neither of which is the airline's country of origin.
8. Cabotage: The right to carry passengers and cargo between two points within a state, other than the airline's country of origin.

Source: Dobson (1995)

Appendix C: Data Sources

Institution	Year / Publication	Data	Variable
European Commission	2000. Eighth Survey on State Aid in the European Union	National state aid officially granted by Member States to all sectors approved by Commission 1994-1998	Available Rents
	Report on Competition Policy, several volumes	State Aid decisions, including subsidies to airlines not classified as state aid by the Commission	State Aid to Airlines
	2001. Updating and development of economic and fares data regarding the European Air Travel Industry	Slot shares of flag carriers at two largest hubs in France and Spain 2000	Hub Dominance
	2002. Study on Competition between Airports and the Application of State Aid Rules. Final Report Volume 1 by the Air Transport Group, School of Engineering, Cranfield University.	Ownership status of largest European hubs, classified by federal, local government, public institution and/ or private ownership	State Ownership Airports
OECD	1998. Competition Policy and International Airport Services	Slot shares of flag carriers at two largest hubs in Italy 1998	Hub Dominance
	1998. The International Regulation Database	Slot shares of flag carriers at two largest hubs (if existent) in Austria, Belgium, Denmark, Finland, Greece, The Netherlands, Sweden and the UK.	Hub Dominance
National Airport Coordinators of Germany, Portugal, Switzerland	Statistical Material	Slot shares of flag carriers at largest hubs in Germany, Portugal and Switzerland 1999.	Hub Dominance
National Airlines	Annual Reports, several volumes	Information on political background of outside directors	Outside Directors
Association of European Airlines (AEA)	Summary of Traffic and Airline Results - STAR	Traffic Data	Relative State Aid Ratio
	AEA Yearbook, several volumes	Government equity stakes	State Ownership
International Civil Aviation Organization (ICAO)	Civil Aviation Statistics of the World, several volumes	Traffic Data	Market Structure Variables
Eurostat	2002. Transport by Air: national and international, intra and extra-EU.	Traffic Data, Press Releases, Official Documents	
World Bank	2000. World Development Indicators 2000.	Macro Data	Control Variables

Appendix D: Data Summary – the Dependent Variables

country	slot share of flag carrier at home hubs 1998-2000 (hd)	state aid / scheduled passenger 1994-2000 (psa)	mean state share in national hubs 2000 (soap)	code share agreements (yes/no) (cs)	protection index	protection index categories (cat)
AUT	13,00%	0,00 €	0,00%	1	2	1
BEL	60,00%	4,73 €	64,00%	1	8	4
DEU	46,50%	2,70 €	22,00%	1	6	3
DNK	50,00%	0,00 €	33,80%	1	4	2
FIN	80,00%	0,00 €	100,00%	1	8	4
FRA	55,00%	16,41 €	100,00%	0	10	5
GBR	33,00%	0,00 €	0,00%	1	2	1
GRC	50,00%	47,05 €	55,00%	0	11	6
IRL	52,00%	3,87 €	100,00%	1	9	5
ITA	67,50%	9,04 €	0,00%	1	9	5
LUX	52,00%	0,00 €	100,00%	0	6	3
NLD	60,00%	0,00 €	76,00%	1	6	3
PRT	43,00%	32,02 €	100,00%	1	12	6
SPA	55,00%	4,31 €	100,00%	1	9	5
SWE	48,00%	0,00 €	100,00%	1	6	3
SWI	61,00%	0,00 €	0,00%	1	4	2

Appendix E: Data Summary – the Independent Variables

country	herfindahlindex of national market concentration 1994 (hi94)	state ownership of flag carrier 1995 (so95)	share of outside directors in board composition of flag carriers 1994/95 (odir)	firm size 1994: total annual scheduled passengers (fsi94)	available rents: total national subsidies as % of GDP; mean 1994-96 (sa9496)	budget deficit 1994 as % of GDP (bd94)	relative market size: total scheduled passengers of national airlines / population (remsi94)	GDP per Capita 1994 (gdp)
AUT	0,525	51,90%	33,00%	2.540.900	0,65	-6	0,47	21.201,57
BEL	1,000	33,80%	.	4.192.900	1,26	-4	0,41	21.293,57
DEU	0,854	41,00%	38,00%	29.955.600	1,97	-1	0,40	20.693,89
DNK	0,649	14,20%	17,00%	4.321.300	0,99	-2	1,05	21.742,91
FIN	0,696	67,00%	56,00%	3.701.300	0,50	-12	0,88	17.465,71
FRA	0,376	94,20%	.	15.587.000	1,11	-6	0,65	19.614,35
GBR	0,290	0,00%	9,00%	27.537.700	0,54	-6	0,95	18.511,20
GRC	1,000	100,00%	.	5.812.900	1,36	-10,82	0,56	12.576,87
IRL	0,738	100,00%	.	3.736.286	0,88	-2	1,35	15.124,41
ITA	0,798	86,40%	.	20.339.100	1,83	-11	0,40	19.429,01
LUX	1,000	36,50%	.	533.000	0,99	0,533	1,32	30.383,18
NLD	0,806	38,20%	55,00%	11.515.400	0,65	-0,492	0,84	19.917,81
PRT	0,714	100,00%	.	3.648.800	1,37	-4,84	0,44	12.922,79
SPA	0,449	99,80%	50,00%	13.754.200	1,14	-7	0,57	14.394,23
SWE	0,667	21,40%	17,00%	8.716.700	0,99	-14	1,23	18.877,42
SWI	0,805	27,00%	27,00%	8.317.600	1,08	-2	1,34	24.819,21

Appendix F: State Ownership of European Airports

State	Airport	National Government Share	Mean
Austria	Vienna	0%	0%
Belgium	Brussels	64%	64%
Denmark	Copenhagen	33,8%	33,8%
Finland	Helsinki Vantaa	100%	100%
France	Paris Charles de Gaulle	100%	100%
	Paris Orly	100%	
Germany	Frankfurt/Main	18%	22%
	Munich	26%	
Greece	Athens	55%	55%
Ireland	Dublin	100%	100%
Italy	Milan Bergamo	0%	0%
	Milan Linate	0%	
	Milan Malpensa	0%	
	Rome Fiumicino	0%	
Luxembourg	Luxembourg	100%	100%
The Netherlands	Amsterdam	76%	76%
Portugal	Lisbon	100%	100%
Spain	Madrid Barajas	100%	100%
	Girona	100%	
Sweden	Stockholm Arlanda	100%	100%
	Stockholm Bromma	100%	
Switzerland	Zürich	0%	0%
	Basle / Mulhouse	0%	
United Kingdom	London Gatwick	0%	0%
	London Heathrow	0%	
	London Stansted	0%	

Source: Commission 2002: Table 3.1.

Appendix G: OLS Regression of Individual Dependent Variables

	Model 1	Model 2	Model 3
	Protection State Aid (psa)	State Ownership Airports (soap)	Hub Dominance Estimate (hd)
Concentration (hi94)	12.239 (0.59)	0.191 (0.27)	0.526* (2.07)
State Ownership (so95)	22.848** (2.42)	0.629* (1.92)	0.137 (1.19)
Log of Firm Size (lnfsi94)	0.734 (0.18)	-0.090 (0.62)	0.078 (1.53)
Available Rents (sa9496)	3.270 (0.30)	-0.319 (0.85)	-0.158 (1.19)
Constant	-29.293 (0.41)	1.859 (0.76)	-0.990 (1.15)
Observations	16	16	16
R ²	0.45	0.36	0.31

Absolute value of t statistics in parentheses

* significant at 10%; ** significant at 5%; ***significant at 1%