DEREGULATION AND INDUSTRIAL CONCENTRATION

IN THE EUROPEAN AIRLINE INDUSTRY

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Abstract

In 1997 a full deregulation process of the European airline industry was completed. This paper focuses on an analysis of that liberalisation on market structure, competition and competitiveness in the European airline industry. Predictions are derived within the theoretical framework of the new theory of industrial structure, most fully developed by Sutton (1991, 1996, 1998), and evidence is provided to support the predictions.

Key words: concentration, endogenous sunk costs, market structure, deregulation, airline industry.

1. Introduction

The new theory of industrial structure most fully developed by Sutton (1991, 1998), has built a new paradigm for empirical research in industrial economics. An important advance of that theory has been to have derived few testable theoretical predictions which are valid over several specifications of the underlying game-theoretic model of firm's behaviour. Robustness of the theoretical results is coupled with the possibility to apply the theory to a very wide range of industries; in contrast, typically previous game-theoretic models depend delicately on assumptions made and, sharper predictions than the lower bound are reached at the cost of applicability of the theory. Examples of very micro studies in the tradition of the New Empirical Industrial Organization (NEIO), which go close in detail of specific markets are M. Slade (1987), T. Bresnahan and Reiss (1991), M. Asplund and R. Sandin (1999, 1999). However, it is well acknowledged as such sorts of work fail to explain statistical regularities widespread across a large number of countries and industries.

This paper applies the Sutton's theory of market structure to the airline industry in order to derive predictions consistent with the theoretical framework, and to support such predictions with data. The goal is to provide a better understanding of the competitive process in the airline industry starting from an investigation of market structure as well as to observe impact of deregulation on concentration. Such analysis of a single industry allow us to pick up specific features of the airline industry which feed into the competitive process. Furthermore, this work complements the relatively small empirical literature in support Sutton's theory for a very wide range of industries in the manufacturing sector, such as Lyons and Matraves (1996), Robinson and Chiang (1996), Symeonidis (2000), Lyons, Matraves and Moffatt (2001); other contributions concentrated within a single industry: A. Dick (2002) for banking in the USA, S. Berry and J. Waldfogel (2003) for newspapers and restaurants in the USA, Marin and Siotis (2004) for the chemical industry, Ellickson (2005) for supermarkets in the USA. In addition, there have been qualitative studies, C. Matraves (1999, 2002) for pharmaceutical and soft drinks industry respectively, which add to theoretical and econometric work done on developing and finding support to the new theory of market structure. Close studies to this paper are C. Matraves (1999, 2002) and A. Dick (2002).

Although studies on concentration and market structure are essentially unexplored topics within studies on air transport industry, we can mention a contribution by G. J. Hurdle, R. L. Johnson, A. S. Joskow, G. J. Werden, and M. A. Williams (1989) which studied the effect of concentration on performance, the effect of potential entry and contestability in the airline industry. However, this work is clearly inserted in the Structure-Conduct-Performance paradigm and Bain's tradition, where the central idea is that structure does matter in determining firm's conduct but it is viewed to be exogenous. Behaviour of firms as a determinant of market structure is not at all taken into account. In this lies the main difference with both this paper and the new market structure theory elaborated by J. Sutton (1991, 1998).

In this paper it is found that the industrial structure of the airline industry is consistent to the Sutton endogenous sunk costs model. More specifically, we have seen that there exists a lower bound to concentration, so market structure does not fragment as market size becomes arbitrary large. Furthermore, the number of leading firms stay loosely constant at various market size of national countries, Europe and USA. Additionally it is found support also to another prediction of Sutton's theory: airline companies tend to *escalate* endogenous sunk cost spending as market size increases; as a consequence, entry is not encouraged and then the structure remains concentrated. Moreover, as a tougher price competition environment is documented as a consequence of both deregulation and development of low-cost sector, as predicted by the theory, this should work as a

concentrating force. Last, it is shown that competition has been taking place at EU level after April 1997.

The rest of the paper is as follows: in section 2 we provide a review of the new theory of market structure; in section 3 it is outlined a historical background of the deregulation process in airline markets in Europe and a treatment of endogenous sunk costs in the industry; section 4 offers empirical results from the application of the new theory of market structure onto the European airline industry; section 5 concludes.

2. Review of Sutton's Theory on Market Structure

J. Sutton with his two books (1991, 1998) has broken down the basic story of industrial structure for which concentration depends on economies of scale, entry barriers and market size. As market size becomes very large, because for example the single European market is created with removal of trade barriers or because of a process of deregulation, liberalisation and privatisation is implemented, the market fragments with an increase of number of firms. Some firms may collapse as a consequence of increased price competition, but the net effect would result in a lower concentration as more firms are put against to each other as a result of the increase in market size. In industries with homogeneous or horizontally differentiated products the presence of fixed sunk costs, which are exogenous in such contexts, do not change substantially the negative relationship between market structure and market size except for the fact to increase the level of concentration. J. Sutton derives a minimal level of concentration, the lower bound, which holds good over a broad class of oligopoly models.

The key findings of the exogenous sunk costs model are: i) a negative relationship market size-concentration[1]; ii) concentration may converge to zero as market size becomes extremely large; iii) tougher price competition causes a more concentrated structure given any market size. As market size grows significantly, firms entry occur until the last firm covers the fixed sunk costs without incurring in losses. In a situation of more intense price competition profits per firm fall; consequently, the number of firms able to survive in the market, ceteris paribus, decreases.

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[1] Sutton (1991) shows that with demand $X=S/p$, where X is quantity sold, S is market size and p market price, supposing N identical firms, constant marginal costs with Cournot competition, the gross profit per each firm is given by $\Pi=S/N^2$. Given fixed sunk costs equal to σ and the free entry equilibrium condition , the optimal number of firms is $N^*= (S/\sigma)^{1/2}$.

For industries where products are vertically differentiated and thus, quality becomes important, Sutton developed the endogenous sunk costs model. Here, the traditional negative relation concentration-market size may break down, since all extra competition emerging from a larger market size is channelled into an escalation process of expenditure in endogenous sunk costs such as advertising and R&D, as pointed out by A. Shaked and J. Sutton (1987). The Sutton (1991) endogenous sunk costs model is based on a series of papers on vertical product differentiation made by A. Shaked and J. Sutton (1982, 1983, 1987).

It is worth noting as Sutton's theory is profoundly different to the Bainian tradition and the Structure-Conduct-Performance paradigm, where market structure is determined by exogenous conditions such as barriers to entry and market size. Whereas, the new theory of industrial structure explicitly takes into account conduct of firms which contribute substantially in determining structure of the market.

In a preliminary paper (1996) and in his second book (1998), Sutton extends and applies the theory of market structure to investigate the relationship between concentration and technology. One of the key points is the distinction among high-alpha industries and low-alpha industries. The author starts from considering why R&D-intensive industries remain fairly fragmented; indeed, in the real world there are examples of industries which show a relatively low degree of concentration though being R&D-intensive such as the pharmaceutical industry. This would be in contrast to the theoretical finding (Sutton 1991) that industries with endogenous fixed sunk costs do not fragment as market size increases, since all extra competition due to a larger demand may be channelled into an escalation process in such endogenous investments. The incentive to gain larger market shares is proportional to market size, so there is further incentive in increasing expenditure in R&D and/or advertising, as such investments boost consumer's willingness to pay. This overhead effect increases economies of scale requiring higher fixed costs to be covered by each firm. Consequently, the traditional negative relationship between concentration and market size may break down in endogenous sunk costs industries. Therefore, why do we observe R&D-intensive industries fairly fragmented? Sutton addresses this question making a distinction inside the category of R&D-intensive industries, between high-alpha and low-alpha industries.

As also noted by C. Matraves (1999), firms can either follow a few or even a single technological path; or can adopt several technologies spreading over them its R&D expenditure. Each technological trajectory may lead to several marketable products, where these products may be

close or distant substitutes for products associated with another technology. Industries where firms choose few technologies are termed high-alpha, and they are associated with the *escalation mechanism* which ends up with high concentration; whereas, those industries where firms adopt many technological trajectories are associated with the phenomenon of *proliferation* of various distinct technologies, are termed low-alpha and concentration will be low. The value of alpha will be higher when quality improvements are cheaper as this encourages escalation in place of entry. Alpha is higher also when only one technology is adopted or all technologies undertaken are close substitutes (and so associated products or product groups). Consequently, under these circumstances of high-alpha, a firm can obtain larger sales and market shares escalating along its chosen technological path respect to the other firms which spend less in other technologies. In low-alpha industries if a firm increase substantially its R&D expenditure will gain only a modest portion of sales, since products or technologies are not close substitutes; as a result, concentration will remain low though we have high expenditure levels in R&D.

Formally Sutton (1996, 1998) used the following example. It is assumed a linear demand model, in which a population of S identical consumers have a utility function defined over n substitute goods, as follows:

$$U(x_1, x_2, ..., x_n) = \sum_k (x_k - x_k^2) - 2\theta \sum_k \sum_{l<k} x_k x_l + M$$

Where M is money spent on outside goods, $M = M_0 - \sum_k p_k x_k$

θ is the degree of substitution between goods, $0 \le \theta \le 1$ where if it is equal to 1 the goods are perfect substitutes. If $\theta = 0$ the goods are independent which means that all cross-elasticities of demand are zero. Now, the above utility function can be extended to allow goods to differ in quality. So, we have

$$U = \sum_k \left[x_k - \frac{x_k^2}{u_k^2} \right] - 2\theta \sum_k \sum_{l<k} \frac{x_k}{u_k} \cdot \frac{x_l}{u_l} + M$$

$u_k \ge 1$ is the quality of good k.

Moreover, Sutton introduced the following relationship between endogenous sunk costs, E, and quality, u:

$E(u) = u^{\gamma}$ where γ is either the cost or alternatively, the effectiveness of R&D in raising product quality.

The equilibrium number of firms (using the zero profits entry condition) is:
$N = 1 + \left[\frac{2}{\theta} - 1\right]\left[\frac{\gamma}{2} - 1\right]$, which clearly says that the minimal level of concentration depends on the degree of substitution of goods, θ, and on effectiveness of endogenous sunk expenditures, γ. Concentration increases as θ increases and γ declines.

Going back to the concept of alpha, now we are in the position to say that it is a function of θ and γ, but both of them are not directly measured. However, the value of alpha can be linked to the R&D to sales ratio and the number of different technologies as pointed out by Matraves (1999).

3. Airline Industry: historic background and endogenous sunk costs

3.1 Historic background of Deregulation process

The airline industry has a history of having been heavily regulated, where market access and fares were determined by international agreements. Indeed, prior to 1984 market access was established by bilateral agreements between two countries. Only specified destinations and routes in both countries were served. In addition, typically a sole airline company of each country was allowed to serve routes specified in the bilateral agreement, and airlines had to be owned and controlled by nationals of designating state. Furthermore, capacity was shared at fifty per cent by each state of the country-pair and fares were subjected to a double approval of the two countries, R. Doganis (2001).

Since 1984 a gradual process of partial liberalisation occurred, with more liberal bilateral agreements. In particular, there has been established open route access allowing airlines to serve any route between two countries participating at the agreement. Moreover, designation of airlines allowed to provide air transport services between each country-pair became multiple. In other words, the rule by which only one airline for each state could operate was removed, introducing the possibility to have access to the market more than one airline. Also capacity restrictions were cancelled, and fares went under double disapproval.

A good example of a more competitive environment, was the bilateral agreement between the UK and the Netherlands negotiated in June 1984. Such agreement, further opened to competition in 1985, was characterised by free-entry of new firms, open route access (designated airlines could operate on any route within the two-state territory), multiple designation, absence of any capacity restrictions and introduction of double disapproval of fares. In 1984, was signed also an agreement UK-Germany and in the subsequent year the United Kingdom concluded agreements with other European countries as Luxembourg, France, Belgium, Switzerland and Ireland. These agreements showed a less degree of liberalisation than the UK-Netherlands; however, multiple designation was adopted by all of them and in some cases capacity restrictions were removed and double disapproval of fares introduced. As we can see such process of gradual liberalisation and creation of a more competitive environment in the air transport service has been introduced all over Europe by airlines practices. The bilateral agreements tailored to remove, at least partly, competition restrictions had the beneficial effect of a substantial reduction of fares and an expansion of service levels, routes served and frequency.

The advent of the Single European Market (SEM) in 1987 which promoted an integration of European economies and markets, fostered a multilateral liberalisation of the European airline industry. In December of 1987 a first liberalisation package was introduced by the Council of Ministers. Such legislative intervention at European level created the condition for a more liberal fare regime and entry of new operators was eased. Additionally, the rule by which each state of the bilateral agreement has the right of fifty per cent of total capacity was removed. Importantly, also the airline industry fell within competition rules of the Treaty of Rome, making many existing bilateral agreements anti-competitive. In June of 1990 a second package was introduced, opening further market access, and making liberalisation of fares and multiple designation. A third step toward full deregulation, occurred on January the 1st of 1993 which guaranteed complete market access allowing airlines of any country within the European Union to serve any route and destination inside the entire EU, with the abolition of capacity restrictions and of bilateral agreements. Moreover, this third package changed the role of the International Airline Tariff Association (IATA) which previously implemented discussions and coordination of air fares. Since then, all airlines can take part to IATA conferences and not only airlines forming part of a bilateral agreement as occurred in the past. However, only since the 1st April of 1997 we can safely assert that the European airline industry is fully liberalised and open to competition as many European countries have chosen to move gradually toward complete liberalisation.

It is worth noting that, in spite of the deregulation and liberalisation process above described, still remains some minor extent of regulation and non-market mechanisms. Airports are often owned and regulated by regional public authorities who determine permissions, so called "slots", to airline companies to take off and land. These slots are typically allocated without following market efficient mechanisms such as bidding schemes.

3.2 Endogenous sunk costs in the Airline industry

The industry seems to be characterised by several quality dimensions such as frequency, punctuality, route density, online facilities, in-vehicle comfort. Regarding frequency it is well worth observing that, though it can be interpreted as a horizontal attribute of air transport service, it could also be seen as a vertical feature of the good, since high frequency increases likelihood of matching preferred users departure and arrival times and overall consumers are better off.

If quality is important in air transport then quality improvements (either real or perceived) may fall, at least partly, on fixed sunk costs. We can therefore identify some sources of endogenous sunk costs which definitely can affect resulting market structure in the airline industry.

Advertising

Although shortage of data on marketing and advertising, there is some evidence that they constitute a good portion of total operator costs. In particular, R. Doganis (2001) mentioned, based on IATA (1996) source, that advertising and promotion expenditure amount to 2.2% of total operating costs. In addition, the increase of using technology for ticketing and reservations (e.g. Internet bookings and sales), which replaced at least in part travel agencies, fostered by the need to contract costs, rises needs to advertise air transport services. Furthermore, Mintel (2003) reported advertising expenses for some low-cost airlines for years 2001 and 2002. These expenditures seem absolutely substantial. Further evidence is provided in website's airlines; for example leading companies such as Air France-KLM, undertake substantial advertising campaigns regarding products and services on offer.

Marketing

Within marketing strategies performed we could mention interventions in improving comfort during air journeys. Again, R. Doganis (2001) offers evidence of airline companies which

have implemented, for example, comfort improvements providing seats convertible in flat beds in first class as British Airways in 1996, and the same company in 2000 introduced sleeper beds in business class. Also Virgin Atlantic made a mid-class cabin for travellers who paid full economy fares forced to share poorly comfortable economy cabin with passengers who had purchased much cheaper tickets. Another key issue is customer care and quality of personal contacts with passengers. For this purpose, frequent and adequate programmes of personnel training are fundamental to maintain existing clientele and acquiring new one. These costs are fixed since seat comfort and personnel training do not vary with output and, at least partly they are sunk as not entirely recoupable. In other words once an airline company has made some comfort improvements regarding cabin seats of its fleet, costs sustained for them do not vary with effective seats used. Similarly although labour costs are related to output, specific personnel training programmes for the labour force in duty to have contacts with passengers (e.g. customer service, cabin crew, check-in personnel) should not vary with variation of number of passengers and in general number of clients.

Branding

Branding is likely to be another source of sunk costs which may enhance (perceived) quality of airline operators. Clearly, branding is related to time for which an airline is present in the market and therefore to the its age. This factor may well affect people's perception on reliability of the company in terms of safety, punctuality and comfort. Under these respects a reputation built by airlines on quality of service provided, in terms for example of frequency and punctuality, may establish somehow a kind of brand loyalty among users.

4. Empirical findings on Market Structure and Market Size in the European Airline Industry

Based on the previous section, the air passenger transport service can be interpreted as an endogenous sunk costs industry or as type 2, following terminology made by Schmalensee (1992) where he split the industry in two types: type 1 are those industries with homogenous and/or horizontal differentiated product; and type 2 are industries with vertical differentiated product. Consequently, given the application of the new theory of market structure, briefly reviewed in section 2, we have few theoretical findings on which evidence is provided.

4.1 Relationship between concentration and market size

We consider C3 as concentration measure (the sum of market shares of the three biggest firms) for European Union, USA and the four largest EU countries in terms of population: Germany, France, Italy and UK. We note that across market size at each geographical market, C3 remains fairly constant. In other words, market structure does not tend to fragment as market size (given by population) increases.

Insert table for C3 and market size in the various countries. Insert eventually a figure about the lower bound.

RESULT 1: concentration appears to remain away from zero as market size increases; as a consequence, there exists a lower bound to concentration.

4.2 Number of leading firms across market size

In this sub-section I provide evidence on what sort of industrial structure the airline industry is likely to be. Specifically, it is investigated the hypothesis whether the airline industry is consistent with the theoretical structure of a natural oligopoly developed by A. Shaked and J. Sutton (1983).

Table 1. Market Size by population in 2005 (million)

Market Size		Number of Leading firms
Germany	82.5	4
France	60.7	4
UK	59.6	5
Italy	57.2	3
EU	458.369	7
USA	298	6

Source: www.bbc.co.uk Population for USA is for 2006 (US census) and,

Datamonitor for number of leading companies in each geographic market.

From table 1 we note that the number of leading companies varies between 3 and 7. In particular, in the biggest four countries in the EU, dominant firms vary only between 3 and 5 although there is a significant difference in population between Germany and the other three national members.

Table 2. Market Size by Market Value ($ billion)

Countries	2000	2001	2002	2003	2004

France	17.1	19.1	20.4	19.7	20.7
Germany	18.5	18.6	19.2	19.2	19.5
Italy	7.2	7.0	6.3	6.3	6.1
UK	21.8	23.1	21.6	23.2	25.0
Europe	90.5	94.3	92.9	94.5	99.1
USA	120.0	111.9	105.0	110.2	116.3

Source: Datamonitor. Europe here is meant to consist of the following countries: Belgium, Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Russia, Spain, Sweden and the UK.

Table 3. Market Size by Volume (passengers million)

Countries	2000	2001	2002	2003	2004
France	101.7	99.4	100.0	99.6	105.9
Germany	142.4	139.4	142.0	149.0	160.3
Italy	88.8	88.4	91.0	99.7	105.7
UK	180.0	181.2	189.8	200.9	216.6
Europe	836.8	834.5	856.4	899.8	964.4
USA	665.2	621.4	613.5	645.1	698.7

Source: Datamonitor. Also here Europe is formed by: Belgium, Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Russia, Spain, Sweden and the UK.

From tables 2 and 3, we learn that there are noticeable differences in market size among geographic markets considered. Although this, table 1 tells us that differences in the number of leading companies among geographic markets are very little. What's more, in section 3 we ascertain that the industry presents some levels of endogenous fixed costs, and quality improvements fall primarily on fixed costs; consequently, under these conditions as found by A. Shaked and J. Sutton (1982, 1983) the market structure will not fragment. More precisely, an arbitrarily large number of firms is still consistent with the theory, but the number of dominant firms once reached an upper bound, do not vary anymore regardless of size of the market.

RESULT 2: The structure of airline industry seems characterised by an asymmetric oligopoly where leading and fringe firms coexist, and the number of dominant airlines do not change substantially at significant increase of market size.

4.3 Structural changes, market structure, price competition and low-cost segment

The most important and relevant structural change occurred in the European airline industry, has certainly been the gradual process of liberalisation and deregulation concisely outlined in

section 3. O. Betancor and J. Campos (2000) analysed econometrically the effect after the first decade of liberal bilateral agreements and of the European deregulation on forty-four international intra-European city-pair round-trip routes. They found that the cheapest economy airfare is 7% lower in routes where liberal bilateral agreements are implemented. For other fare types their results are inconclusive. However, although weak the effect of opening up to competition of the industry has been beneficial, especially in terms of a much wider implementation of tariffs among which users can choose. Further and stronger evidence of an increase of price competition is provided by H. Coles (2004) for the UK and European airline industry . The boost of price competition has been further enhanced by the development of a new (in Europe) entrepreneurial initiative: the low-cost model of airline operation. The development of the low-cost sector primarily in the UK and then fairly spread across Europe, has been clearly due to the liberalisation and deregulation of the industry. Moreover, these two elements (deregulation and low-cost sector) have substantially contributed to make tougher price competition.

Now, we know that the new theory of industrial structure finds that an increase of price competition promote an increase of concentration in exogenous sunk costs industry. J. Sutton (1991) did not develop implications and effects of price competition on endogenous sunk costs industries. As pointed out by G. Symeonidis (2000) the theory appears inconclusive, since if endogenous sunk costs expenditures either remain constant or rise following an increase of price competition then concentration must boost; whereas, in the case of a decrease of endogenous sunk costs expenses as a consequence of an increase in price competition, it is not clear whether concentration rises or declines, as the loss in gross profit, due to tougher price competition, may or may not be offset by the fall in sunk costs, as a consequence concentration may rise or decline. However, the author succeeded in restricting the space of possible outcomes about the pattern of concentration and endogenous sunk costs spending following an intensification of price competition. In particular, a more vigorous cartel policy promotes an increase in concentration in intensive-advertising manufacturing industries and, with less confidence and certainty, a fall in advertising expenditure (Symeonidis 2000). Again Symeonidis (2000) in another paper, offers an econometric analysis of effect of cartel policy measures on price competition and market structure in the UK manufacturing sector over the spell 1958-1977. He finds that an increase in price competition promotes an increase in concentration in both exogenous and endogenous sunk costs industries. Therefore, the inconclusiveness of the theory for type 2 industries is overcome by establishing empirical regularities. Given this reasoning we can end up with the following:

RESULT 3: A tougher price competition pushes forward the minimal level of concentration; as a consequence, for the airline industry we should expect a more concentrated equilibrium number of firms.

I need to find data on merger activity and concentration index.

The deregulation process and the advent of the SEM which involved also the airline industry, discussed in section 3 lead us to the following:

RESULT 4: The main effect of both deregulation and the SEM is to increase the degree of substitutability,θ, which given the Sutton's theoretical framework will boost concentration at European level.

Evidence on the previous finding would be given by an observation on data about concentration measures in the big four, EU and USA. If we had various levels of concentration at national stage, with no systematic pattern of the concentration measure; in contrast, we had an increase of concentration at EU, then we would conclude that concentration would be more closely associated with EU market size than that market size of national countries; as a result, competition has been driven at EU level. Instead, if concentration data is systematically increasing in national countries, then market size linked to concentration will be at national level; as a consequence, competition has been fought at national level in place of EU.

I need data on concentration about national countries and at European and US level, and doing a comparison.

4.4 Endogenous Sunk Costs and Market Size

Evidence of an increase in market size, in addition to tables 2 and 3, is also provided by the increasing practise adopted by international airlines of using Internet booking and ticketing. This phenomenon clearly makes much greater the number of consumers reachable and therefore, it represents a significant boost of market size. As travel agencies have been replacing by that massive use of information technology, we also have been attending an increasing expenditure in advertising and in marketing strategies, with the goal to acquire larger market shares and in finding new profitable market segments. This sheds light more clearly on competitive weapons used by firms, which do not rely prominently and exclusively on price. As a result, the increase in market size

caused by liberalisation, deregulation and SEM, wide and spread use of information technology for reservations, booking and ticketing should not allow us to conclude that the entire extra competition created by these factors is channelled only into price competition. Indeed, as the industry being of type 2, the mechanism at work is that of an escalation process in sunk costs which contribute to increase the quality of air transport services. What's more, it seems from evidence of literature on effect of liberalisation on competition, as for example Coles (2004) and Betancor and Campos (2000), that price competition is fairly the almost only one competitive weapon only in short distance journeys and in the lower end of the market, where low-cost companies compete with traditional carriers on the lowest basic fares.

The previous argument and the anecdotal evidence on endogenous sunk costs spending, such as advertising and personnel training programmes, provided for example by Mintel (2003) and R. Doganis (2001), yield the following finding:

RESULT 5: As market size increases, expenditures in endogenous sunk costs, such as advertising and other marketing strategies like specific personnel training program, increase per surviving firm.

5. Conclusions

This paper proposes an application of the new theory of market structure, most fully developed by J. Sutton (1991, 1998), to the European airline industry. It presents evidence in support findings which are derivable within the theoretical framework. Evidence proposed suggests that mechanism at work in the airline industry is consistent with the Sutton's theory, and then the industry is well characterised to be of endogenous sunk costs type; moreover, such costs do play a role in shaping market structure. Furthermore and importantly, it is shown that competition, after 1997, has been taking at European level instead of at member states.

This is a provisional incomplete draft. Further data is expecting mainly from ICAO (International Civil Aviation Authority) about market shares in EU, USA, France, Germany, Italy and UK. Collecting that data will be possible to find support for results 1, 3 and 4. If data will be enough (as

hopefully it should be) will be possible to do an econometric estimation of the lower bound using Smith's estimation procedure (Richard L. Smith, (1994), Biometrika), the same statistical technique used by Sutton (1991). What's more, with the further data that it is expected, it will be possible to construct Lorenz curves for a further appreciation of the distribution of market shares across dominant and fringe firms; consequently, giving further support to result 2.

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