International Comparison of Privatization and Deregulation among the USA, the UK and Japan - Volume III : Airline and Trucking -

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THE ECONOMIC ANALYSIS
No. 143
December 1995
Economic Research Institute
Economic Planning Agency
Tokyo, Japan

International Comparison of Privatization and Deregulation among the USA, the UK and Japan
- Volume III: Airline and Trucking (航空業及びトラック輸送業) -

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Hirotaka YAMAUCHI

This is one of the four volumes from the research project on “International Comparison of Privatization and Deregulation”. Others are as follows.

Volume I: Telecommunications (電気通信業)
Volume II: Electricity (電力業)
Volume IV: Country and General Overview (国別及び全体評価)
International Comparison of Privatization and Deregulation among the USA, the UK and Japan
- Volume III : A. Airline -

USA paper: Steven A. MORRISON
UK paper: George YARROW
Japan paper: Hirotaka YAMAUCHI
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*) Early version of the papers were presented at the sub-conference on “International Comparison of Privatization and Deregulation” at the Economic Research Institute, Economic Planning Agency on March 23-24 1995.

We are grateful to all the committee members of this project. We especially thank Miles O. BIDWELL JR, Martin CAVE, Helen LAWTON-SMITH, Colin ROBINSON, Tsuruhiko NAMBU, Hisao KIBUNE, Isoroku SAWADA, Masaru ETO, Akira FURUKAWA, Hiroshi TSUBOUCHI, Masahiko TSUTSUMI, Hiroshi YAMAOKA, Yoshiki YAMAGUCHI, Osamu ICHINOSE and other participants at the sub-conference for their helpful comments, suggestions and arrangements. All remaining errors are, of course, our own.
要約表（規制及び規制緩和の性質についての日米英国際比較）

この比較表は経済研究所の事務局が共同研究者の提出した産業別論文に基づいてとりまとめたものである。内容について不十分な点や誤解があればそれらは事務局に敬意を表す。引用する際には元の産業別論文を用いていただきたい。

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<tr>
<td>A. 小史</td>
<td>JAL（日本航空）は1952年に設立され、その後半官半民の企業に再編され、ANA（全日空）は1957年に誕生した。1970年で主要政策変更が行われてTDA（東京国内航空）が設立され、三大企業によって国内線・国際線市場が分割された。いわゆる70-72年体制である。幹線ルートの市場は急速に発展し、航空会社内での内部補助が必要になった。</td>
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「旧体制」は国際環境に変わらせる事をえないかった。即ち、国際貨物輸送市場へのNCAの参入はJALによる独占の崩壊をもたらした。また1985年以降、日本航空は相互に3社の新規参入を認めることで妥結した。

1986年の新政策は「ダブルトラッキング」（1路線で2社運航）と「トリプルトラッキング」路線の導入によって競争の促進を図った。しかしながら規制の変更は、民間航空法による規制の枠組みを変えることなしに行われた |

1938年の民間航空法は基本的に変更なく1978年まで続いた。民間航空局（CAB）は既存の16社に既得権（grandfather rights）を与え、それにまで運航していた路線の免許を交付した。CABは幹線への新規参入を決して許可しなかったが、支線・コミュニティ・チャーター便は徐々に許可された。料金は報酬規制で、また長距離路線はコストより高く、短距離はその逆という内部補助が見られた。航空会社は設備や運行頻度などのサービスの質で競争した。

規制は1950年代から批判され始めた。CAB規制のスタンスも1975年に幾分緩和されたが、アルフレッド・カーがCAB委員長に任命されてから、規制緩和のプロセスが加速した。最終的に1978年に航空規制緩和法が成立し、段階的に参入（1982年）退出、料金（1983年）規制が撤廃された。1985年にはCABが廃止された。

英国航空（BA）は1972年に誕生した。また競争を導入するという1969年の政策変更の結果として、ブリティッシュ・エアロニール航空（BA）の組織が見られた。民間航空局（CAB）はB calに相当する企業ができた。普通航空局（CAB）はB calに相当する企業ができた。1981年までBAは公企業であった。合理化を進めるためにはかわらず、その財務状況は比較的貧弱であった。

1979年からBAの営業化準備が始まった。1984年にBAは公有の株式会社となり、1987年には政府はすべての株式を売却した。

1980年民間航空法は規制緩和を求めた。しかし1986年にはB calは経営困難に陥ったためBAはB calを合併し、その支配的地位をさらに強めた。

1980年代には国内運賃や路線免許の規制撤廃の新たな重要性が見られた。国内航空への多くの参入機会が取り除かれた。
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<td>B. 総括的評価</td>
<td></td>
<td></td>
<td>外はヒースロー空港へのアクセスで、混雑とスロット割当システムのため、1977年以前にヒースロー空港に就航していなかった航空会社はアクセスを認められなかった。この禁止措置は1991年に撤廃されたが、現在も割当手続きは既存の運航会社にかなり有利に行われている。</td>
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<td></td>
<td>政府はアメリカ式の規制緩和を拒否しており、その論拠となっている。かくして参入・価格規制は手つかずであった。複数規制は行政の裁量権の範囲をかえて広げてしまった、との批判もある。</td>
<td>規制緩和の効果を調べるには規制緩和が行われていなかった場合と比較して分析すること（counterfactual analyses）が重要である。</td>
<td>英国政府の「複数航空会社」政策はうまくいかなかった。BAの国内での競争相手を育成しつつ、他方でBAの競争力を高めるというあい対する目標を追わなければならなかった。このため競争の範囲は限られ、Bcal及び他の幾つかの参入者は破綻し、規制当局には大きな打撃となった。</td>
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<td></td>
<td>競争促進といってもかなり限られたものであったから、米国でみられたような大幅な消費者余剰の増加は日本では生じていない。1994年の法改正後でさえキロ当たり平均運賃は米国よりはるかに高い。</td>
<td>座席数や距離を生産することには規模の有利性はないが、マーケティングにおいては顕著に規模の経済性がある。しかしながら、これは規制緩和が失敗だったということを意味するのではない。航空市場を規制緩和することは、たとえそれが不完全であったとしても、規制された航空市場よりは良いというのが支配的な見解である。</td>
<td>しかしながら、BAのパフォーマンスを改善する方策、すなわちまず財政再建を行ない後に民営化するという措置ははるかに成功した。価格と単位費用の下落、事業や投資の拡大、収益</td>
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<td></td>
<td>規制の変更は路線の再配分、言い換えれば既</td>
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<td>得権益の再配分にすぎないとしばしば指摘されている。</td>
<td></td>
<td>性の維持などにみられるように、BAのパフォーマンスの記録は良好だった。</td>
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<td>E Cの共同運輸政策には初め航空産業は含まれていなかった。いくつかの加盟国の規制政策スタンスの変化と米国からの圧力により、欧州航空輸送市場は緩やかながら明確に自由化されていった。ECの競争政策と国庫補助の一般原則適用の増大に加えて、ECの航空政策は3次元のパッケージによって行われた。そのうちのものは、運賃の自由設定、若干の制約付きながら・不定期便に関する同一規制などが含まれる。</td>
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<td>C.</td>
<td>項目別評価</td>
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| a. 参入・退出 | 運航社数は1978年43社から1984年のピーク時に87社まで増加したが、合併等を通じて1991年末には60社まで減少した。 |                                                                        | 羅ンドン-欧州各都市間の主要路線では、運航社数はどの路線でもほとんど2社であったのが1990年には平均4社に増加したが、その後3社まで減少した。新規参入は英国の「複数航空会政策」と、BAとB calの合併時に新規参入
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<tr>
<td><strong>b. 價格・運賃</strong></td>
<td>米国と日本の単位当たりの料金を比較すると、正規運賃では日本は米国よりも割安であるが割引運賃では数倍高い。米国では乗客の90%が割引チケットを使用している。1994年の法改正後でさえ、キロ当たり平均運賃は米国よりもはるかに高い。</td>
<td>実質運賃は下落傾向を描いてきた。1993年には1976年の2/3となった。counterfactualな分析によれば、運賃は規制があった場合に比べ1976-93年の年平均で22%低いとの結論が得られた。実質料金下落の58%は規制緩和によるものである。乗客の70%は規制があった場合に比べて少ない支払いで済んでいる一方、14%は2倍以上払っていた。</td>
<td>B Aは1981年の財政危機によって運賃を上げた。1985年から自由化の影響で確実に低下してきている。生産性はB Aの合理化により1980年代前半に向上した。その後停滞したが最近ではおそらく全州の航空各社の競争圧力を反映して再び上昇傾向に転じている。</td>
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<td><strong>c. 雇用・賃金・倒産</strong></td>
<td>雇用は、景気循環によって左右されはしたが1976-93年に80%増加した。しかしコンチネンタル航空とTWAは倒産時に数千人を解雇したが、イースタンとバンナムはピーク時で約8万人あった従業員とともに消滅したことも事実である</td>
<td></td>
<td>B Aは民営化以前大規模なリストラを行い、雇用を1/3削減した。民営化後、雇用は増加したが、つい最近では競争圧力により再び減少傾向にある。賃金水準は他の全州各社に比べて低い。</td>
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<td>d. 企業収益</td>
<td>総コストは、主に販売・管理費や旅行代理店への手数料によって、1986年の親制変更後上昇はじめた。平均負荷率は1986年の前と後で目立った変化はない。これは親制の変更が航空会社の生産性にほとんど影響を与えていないという事を示唆している。規制変更後、コストの上昇とイールドの減少によって利益率は全く不安定で経済循環の影響を受け続けている。また、コスト構造も規制変更の影響も各社間で異なっている。</td>
<td>収益は経済状態に大幅に影響されている。規制緩和の影響は不明確であり、航空会社間で大きく異なっている。</td>
<td>ＢＡの実質単位コストは1975-85年の間、年0.4%のゆるやかな低下傾向にあった。1985年以降はこの傾向は年4.4%の急激なものとなった。この急激なコストの低下は、部分的には1980年代前半の大きなリスクラが原因であると言えるが、規模の経済の達成及び親御援助と民営化もまた貢献している。ＢＡの収益性は1980年代前半に改善された。1990年代には世界の主要な航空会社が損失を計上するなか、利益を維持していた。</td>
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<td>f. 投資</td>
<td>物的資産への投資は規制緩和以降急速に拡大している。</td>
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<td>1980年代前半、B Aはリストラを反映して投資は減少したが、民営化後は増加した。</td>
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<td>g. 消費者余剰・生産者余剰</td>
<td>現実の路線ごとの運賃は平均コストに基づく価格とは一致しない傾向にある。もし運賃設定が平均コストに基づくようになれば、長距離・幹線乗客が大きな利益を得、逆の場合は損失を被る。これらを合わせた消費者余剰の名目純増は約70億円となる。</td>
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<td>ある推計によれば、B AがB calよりも運賃を引き上げたため、B Aの民営化消費者余剰を低下させたとされる。しかしながら、この引き上げは国営企業への財政負担を減らそうとする政府の政策であったのであり、民営化の結果とは言えない。結果は恐らく誇張されている。</td>
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<td>h. 市場構造</td>
<td>「トリブル・トラッキング」（「ダブル・トラッキング」）路線は路線数で全体の6%（13%）、乗客数で43%（23%）を占めている。</td>
<td>規制緩和の第一段階では市場集中度が低下したが、その後1980年代半ばには大規模な合併により一気に上昇した。 しかしながら、一線当たり平均運航数は1980年代半ばまで増加し、その後は横ばいで、現在は競争がより活発であることを示している。したがって、大規模な航空会社が「全国」市場の大半を支配するようになったが、都市間 の英国の航空産業はB Aがドミナントな地位を占めている。自由化の時点での輸送能カシェアで60%を越えており、多くのニッチ業者がチャーター市場で営業していたとは言えも主要な競争相手はB calしかなかった。当初はB Aがシェアはチャーター事業の急速な成長とヴォージン・アトランティックの参入により低下した。しかし、1987年のB calの買収後はB Aの</td>
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<td>j. 外部不経済</td>
<td>安全規制は変わっていない。乗客の死亡率は規制緩和後の期間にもさらに改善されている。</td>
<td></td>
<td>規制緩和によって安全性に関するデータが悪化したとは認められない。</td>
</tr>
<tr>
<td>D. 教訓・政策含意・将来見通し</td>
<td>実施された競争促進策は他の先進国で採られた規制緩和政策とはかけ離れている。日本の消費者はほとんど利益を受けていない。政府は早急により効果的な競争促進政策を採るべきである。価格競争が認められてなかったので、航空会社は便数や航空機サイズのようなサービス競争に明け暮れてきたようだ。この種の競争は過剰能力をもたらす可能性があるが、日本では空港容量の制約からそのような影響は認められない。</td>
<td>フリークエント・フライヤー（ＦＦＰ）、コンピューター予約システム（ＣＲＳ）、代理店手数料に関して問題が発生しうるが、消費者への影響はまだ明らかでない。ＦＦＰは大航空会社に有利に働き小規模会社に不利に働きうるが、必ずそうなるとも言えない。ＣＲＳのディスプレイ・バイアスは1984年に違法とされたが、設計バイアスのハロー効果（halo effect）は残っている。旅行代理店へのインセンティブは規制時代には固定されていたが、その後自由化された。19</td>
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<td>93年には実質手数料は航空会社の運賃収入の平均12%になっている。非線形の手数料体系は旅行代理店の行動に影響を与え、より大きな航空会社に有利になっている様相である。</td>
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Summary Table

COMPARISON OF CHARACTERISTICS OF REGULATION/DEREGULATION AMONG THE USA, THE UK AND JAPAN

This comparison table was compiled by the ERI staff members, based on the eleven industry papers presented by the co-study participants. The staffs are responsible to any inadequateness of the references and misunderstandings. For quotations, please use the original industry papers.

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<td>A. BRIEF</td>
<td>The JAL was established in 1952, then reorganized as a half-public corporation. The ANA was born in 1957. In 1970 and 1972 a major policy change was conducted, which established the TDA, and which segmented domestic and int’l markets with the big three, the so-called 1970-1972 airline regulation regime. The trunk route market grew much faster, allowing airlines to cross-subsidize. The “old regime” had to be altered because of int’l environment. The NCA’s entry in int’l cargo transport brought about a collapse of the JAL’s monopoly. The Japan-US negotiation that started in 1985 concluded that three new entry each be allowed. The new policy in 1986 allowed promotion of competition by introducing “double-tracking” (2-carriers in one route) and “triple-tracking” routes. However, the regulatory change was rather limited because it was implemented without modifying the regulatory framework of the Civil Aeronautics Law. In 1994 the Law was amended, allowing flexible discount rate setting.</td>
<td>The Civil Aeronautics Act of 1938 remained until 1978 basically unchanged. The CAB gave 16 carriers which had operated then the “grandfather” rights and granted certificates for the route they served. The CAB never granted trunk route award for new entrants, though new entry into feeder service, commuter, and charter were gradually allowed. Fares were subject to rate-of-return regulation, and cross-subsidization was seen with fares higher-than-cost long routes and vice versa. Airlines competed with service quality, such as equipment and flight frequency. The regulation began to be criticized since the 1950s. The CAB regulatory stance was somewhat relaxed in 1975. Alfred Kahn was appointed chairman of the CAB, accelerating the process for deregulation. Finally in 1978 the Airline Deregulation Act passed, phasing out entry (1982), exit, and fare (1983) regulations. In 1985 the CAB was abolished.</td>
<td>British Airways was formed in 1972. Also existed was British Caledonian Airways (Bcal) as a result of the 1969 UK policy change to introduce competition. The Civil Aviation Authority (CAA) gave some preference on licensing policy to BCal. Until 1981 BA was operated as a public corporation. In spite of rationalization efforts, its financial performance was relatively poor. Since 1979 preparation for privatization of BA started. In 1984 BA became a public limited company. In 1987 the Gov’t sold the entire stake. The Civil Aviation Act of 1980 required more liberal policy. But in 1986 BCal ran into financial difficulties, and BA acquired BCal and thereby enhanced its leading position further. In the 1980s major deregulation measures were also taken, such as domestic fare and route licensing deregulation. Many entry barriers into domestic services were dismantled. The exception was access to Heathrow airport because of congestion and the slot allocation system, so that no airline that had not been operating from Heathrow before 1977 would be granted access. This ban was lifted in 1991, but the allocation procedures continue to afford considerable advantage to incumbent operators.</td>
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<td>B. GENERAL ASSESSMENT</td>
<td>The government rejected an American-style deregulation, stressing capacity limitation of major airports. Thus the entry and price regulations remained intact. Critics say the multi-airline scheme even widened the range of administrative discretion. Due to the rather limited nature of the promotion of competition, substantial consumer surplus gain which was seen in the US was not the case in Japan. Even after the 1994 amendment, the average fare per kilometer is much higher than in the US. It is often pointed out that the regulatory change was just reallocation of routes or reallocation of vested rights.</td>
<td>Counterfactual analyses are important to assess the effects of deregulation. Though there are no advantages of large scale in producing seat miles, there are significant economies of scale in marketing. However, it does not mean that deregulation was a mistake. The majority view is that deregulating airline markets, with their imperfectness, are better than regulated airline markets.</td>
<td>The UK Gov't “multi-airline” policy has been a relative failure. It always faced a tension between promoting domestic rivals to BA and enhancing BA's competitiveness. So the scope of competition was limited and BCal and some other entrants failed, a major blow to the regulators. However, measures to improve BA's performance, first to conduct financial restructuring and later to privatize it, have been much more successful. The performance record of BA has been good, such as price and unit cost fall, expansion of business and investment, and maintenance of profitability. EC's common transport policy initially did not include the airline industry. Due to changes in regulatory stance of some Member countries and pressure from the US, European air transport markets have slowly but definitely liberalized. In addition to increasing application of EC general rules of competition and state aids, the EC airline policy has occurred through three packages adopted. The most recent one includes: free pricing regime for fares; open market access with some restrictions; common airline operators license regulations; and same regulation on scheduled and non-scheduled services.</td>
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<td>C. ASSESSMENT OF SELECTED ITEMS</td>
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<td>a. ENTRY AND EXIT</td>
<td>Number of airlines increased from 43 at end-1978 to the peak of 87 during 1984, then decreased to 60 at end 1991, through such activities as merger.</td>
<td>Among busiest routes between London and European cities, number of carriers in each route first increased from mostly 2 to average 4 in 1990, then decreased to 3. The new entry reflected the UK's &quot;multi-airline&quot; policy and EC's requirement to surrender landing slots to new entrants at the time of the BA-BCal merger. The following decrease reflected the reversal of UK stance after the BA privatization.</td>
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<td>b. PRICE AND FARE</td>
<td>Compared with the unit fares between the US and Japan, though normal fares in Japan tended to be lower than the US, discount fares were several times higher. In the US 90% of passengers use discount tickets. Even after the 1994 amendment, the average fare per kilometer is much higher than in the US.</td>
<td>Real fare has been on the downward trend; in 1993 2/3 of 1976. According to a counterfactual analysis, the rate has been 22% lower than the case of regulation at an annual average bet. 1976–93. 58% of total decline in real fare is attributed to deregulation. 70% of passengers pay lower than regulated case, while 14% more than twice.</td>
<td>BA raised its fare following the financial crisis of 1981. Since 1985 fares are on a firmly declining trend, reflecting increasing liberalization. Productivity increased in the early 1980s due to BA rationalization, then stagnated afterward, but recently regaining the upward trend, arguably in response to greater competitive pressure on European airlines.</td>
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<td>c. EMPLOYMENT, WAGE, BANKRUPTCY</td>
<td>Employment increased by 80% bet. 1976–93, though fluctuated according to business cycles. Continental Airlines and TWA shed several thousand at the time of bankruptcy, and Eastern and Pan Am disappeared with 80 thousand employees at peak time. Airline workers' general earning averaged $52,188, compared to $34,536 for all workers. The earning gap has been closing; since 1980 airline workers' total nominal compensation increased by 3.9% a year, while total workers 5.2%.</td>
<td>Before the privatization BA conducted a major restructuring, cutting its employment by 1/3; after the privatization its employment increased, but more recently it is on the declining trend due to competitive pressure. Wage level is lower than carriers of other European countries.</td>
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<td>d. CORPORATE PROFIT</td>
<td>The total cost began to increase after 1986 regulatory change, mainly due to sales and administration costs and travel agent commissions. The average load factor did not change significantly between before and after 1986, suggesting the regulatory change hardly contributed to airlines’ productivity. After the regulatory change, due to cost increase and yield decreasing, the profit rate has been quite unstable and subject to economic cycles. Not only the cost structure but the effect of regulatory change are different from one airline to another.</td>
<td>Heavily affected by economic conditions; Effect of deregulation is unclear; substantial difference between carriers.</td>
<td>BA’s real unit costs were declining at a gentle trend rate of 0.4% annually bet. 1975-85, then after 1985 this trend increased sharply to 4.4% per annum. The sharp cost decline can be partly ascribed to the enterprise’s major restructuring in the early 1980s, but deregulation and privatization, as well as achievement of the economies of scale, can also contribute to the trend. BA’s profitability improved in the early 1980s. In the 1990s its profit remained positive, during years major airlines made losses.</td>
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<td>f. INVESTMENT</td>
<td>Physical asset investment expanded rapidly since deregulation.</td>
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<td>In the early 1980s BA’s fixed investment declined, reflecting its restructuring, then increased after the post divestiture period.</td>
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<td>g. CONSUMERS’ AND PRODUCERS’ SURPLUS</td>
<td>Actual route-by-route fares tend to deviate from average cost-based prices. If pricing were based on average cost, long-haul, large market-size passengers would benefit largely, and vice versa. The net nominal total gain of consumer surplus would be about 7 billion yen.</td>
<td></td>
<td>According to an estimation, the privatization of BA led to lower consumer surplus, because of BA’s price hike compared to BCal. However, as the price hike was a Gov’t policy to reduce the burden of state-owned sector, the result was probably an exaggeration.</td>
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<td>h. MARKET STRUCTURE</td>
<td>The “triple-tracking” (“double-tracking”) routes account for 6% (13%) of the total number of routes, and occupy 43% (23%) of the total number of passengers.</td>
<td>Market concentration declined at the first stage of the deregulation, then jumped up in mid-1980s with big mergers. However, the average numbers of carrier in one route rose until mid-1980s and steady since then, indicating the competition now is stronger. So, though larger airlines control more of the “national” market, at the city pair level airlines compete more.</td>
<td>The UK airline industry is dominated by BA, with over 60% capacity share at the time of liberalization, with only one major rival BCal, though many niche operators served the charter market. Initially BA’s share fell due to rapid growth of charter business and the entry of Virgin Atlantic, but after the takeover of BCal in 1987, BA’s share rose again to more than 60%.</td>
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<td>j. EXTERNAL DISECONOMIES</td>
<td>Safety regulation was unchanged. The probability of an airline passenger dying has improved during the deregulated era.</td>
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<td>Deregulation does not appear to have led to any significant deterioration in the safety record.</td>
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The competition policy implemented was far from the deregulation policies adopted in other industrialized countries. Japanese consumers hardly benefited. The government should urgently adopt a more effective competition policy. As price competition has been ruled out, airlines seem to have engaged in service competition such as frequency and aircraft size. This type of competition could cause over-capacity, but in Japan, due to airport capacity limits, such effect has not been recognized.

Potential problems related the FFP, CRS, and agent commission, though their impact on consumers is yet to be known. FFP can, but need not, advantage large carriers and disadvantage small ones. CRS display bias was outlawed in 1984, but “halo effect” of architecture bias remains. Travel agent incentives had been fixed under airline regulation, then liberalized. Real commissions averaged 12% of fare revenue in 1993. Non-linear commission seems to affect travel agent behavior and to give an advantage to larger carriers.
1. United States

THE EFFECTS OF AIRLINE DEREGULATION
IN THE UNITED STATES

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1. Introduction

After forty years of tight regulation by the federal government, the airline industry was deregulated in 1978. Such a dramatic change in an industry's economic environment is bound to have significant effects and the airline industry is no exception. Airlines provide an interesting example of how an industry evolves when freed from government regulation. After more than a decade and a half of deregulation, this evolution is still not complete, although the form to which the industry is evolving is becoming clear.

This evolution has not been without controversy. Each zig and zag of the industry renews the debate about the wisdom of deregulation and the future of the industry. The industry has this high profile because many people are fascinated with aviation. Others devote attention to airlines because airline deregulation was the first of many regulatory reforms (e.g., railroads, trucking, telecommunications, banking) in the late 1970s and 1980s. As the oldest deregulated industry, analysts look to airlines for insight into other industries. Although the airline industry is a complex one, it is amenable to study because of the wealth of data—a legacy of regulation—the government continues to collect.

This paper chronicles and explains the evolution of the domestic passenger airline industry since it was deregulated in 1978. The second section presents a brief history of the industry. Following that are the two sections that constitute the core of the paper: an examination of evolution of the industry in terms of concentration, fares, etc., and an analysis of some possible trouble spots in the industry. A summary concludes the paper.

2. History

The aviation age began in 1903 at Kitty Hawk, North Carolina when Wilbur and Orville Wright performed the first power-driven, heavier-than-air, controlled flight. It was just eleven years later, in 1914, that scheduled commercial passenger service began. For $5 the St. Petersburg-Tampa Airboat Line carried passengers 18 miles between Tampa and St. Petersburg, Florida. Significant growth in the industry would wait until after World War I, and then it was mail rather than passenger transportation that developed.

Carriers were paid for carrying mail based on the weight of the mail and the distance traveled (pound-miles). At one point, after several changes in postage rates and in payments to carriers, carriers received more for carrying mail than the cost of the postage. This posed financial problems for the Post Office, which were exacerbated by the incentives carriers had to mail heavy packages to themselves! Aviation continued to develop during the early 1930s, despite the Depression, because of significant technical advances in aircraft design and manufacturing. Finally, in 1938 Congress passed the Civil Aeronautics Act, which remained basically unchanged until deregulation in 1978. The Act subjected the industry to public utility-type rate-of-return regulation. To implement the regulations, the Act created what was to become the Civil
Aeronautics Board (CAB). This legislation, enacted during the Great Depression, reflected the widespread distrust of market forces that prevailed then and the belief that government regulation could improve the market outcome.

The Civil Aeronautics Act required carriers to have a certificate of public convenience and necessity issued by the Board. The sixteen carriers operating when the Act was passed received “grandfather” rights and were granted certificates for the routes they served. Other applicants had to show that they were “fit, willing, and able” to perform the proposed service and that the service was “required by the public convenience and necessity.”

The Act allowed the entry of new carriers, but the CAB never granted a major (trunk) route award to a new entrant. However, the Board did allow entry into other categories: “local service” carriers providing feeder service for the trunks (1943); air taxi and commuter airlines operating small aircraft (usually less than 20 seats) (1952); and supplemental (charter) carriers (1962). Nonetheless, from the beginning of CAB regulation in 1938 until one year before deregulation in 1978, the Board did not permit entry on any route that already had two or more carriers.¹

Initially the CAB set air fares equal to prevailing first-class rail fares. Ultimately the Board set fares as a function of distance so the industry would earn a 12 percent return on its rate base, assuming a 55 percent load factor (percentage of seats filled). Because the Board felt that cross-subsidization of short-haul routes by long-haul routes would foster the development of aviation, a fare formula was designed so fares for long routes were greater than costs and fares for short routes were less than cost.

Although airlines effectively were prohibited from engaging in price competition, they were allowed to compete with service quality, especially equipment and flight frequency, which were explicitly not under the Board’s control. Carriers added equipment and flights in the lucrative long-haul markets and reduced flights (to the extent allowed) in unprofitable short-haul markets.

Besides regulating entry, the Board also regulated exit. To exit a route, a carrier had to obtain CAB approval. Because the Board’s restrictive entry policy gave value to a carrier’s right to serve a route, firms did not exit the industry through bankruptcy. Instead, they “exited” through mergers, which provided a convenient way for a healthy carrier to acquire route authority.

2.1. The Deregulation Movement

Economists began criticizing CAB regulation as early as the 1950s. Gradually, more and more analysts accepted the position that the airline industry did not have characteristics that made economic regulation necessary. The critics argued that airline regulation had led to higher fares than would prevail in an unregulated market, yet the industry was not earning excess profits.

Since the Civil Aeronautics Act regulated “interstate air transportation,” airlines operating

¹ Bailey (1980).
only within one state were not subject to federal regulation. This aspect of the law set up an interesting “controlled” experiment of sorts: by comparing unregulated intrastate fares with fares on similar interstate routes, a measure of the effects of regulation could be obtained. One particularly influential study pointed out that in 1965 the fare charged by the intrastate carrier Pacific Southwest Airlines (PSA) between San Francisco and Los Angeles (338 miles) was $11.43, while the fare charged by CAB certificated carriers between Boston and Washington, D.C. (400 miles) was $24.65.2

In 1975 the Ford administration sought deregulation of the airlines. Shortly thereafter, during 1976-1977, the CAB began to loosen regulatory control by interpreting the existing statute more liberally, a trend that increased dramatically when economist Alfred Kahn was appointed Chairman of the CAB in 1977. The resulting liberalizations, such as the Board approval of American Airlines’ proposed “Supersaver” fares in 1977, gave legislators a inkling of how a deregulated marketplace would function. Although the Congress was won over, airlines themselves (and airline labor groups) remained largely unconvinced of the wisdom of deregulation: most airlines and unions opposed deregulation.

Finally, in 1978, Congress passed and President Carter signed the Airline Deregulation Act. The overriding objective of the Act was reliance on competition. Entry regulations were phased out; since 1982 carriers have been free to enter any route they desire, as long as they are fit, willing, and able. Exit regulations were eliminated; carriers can now exit at will. Fare regulation was also phased out. In 1983, the CAB’s authority over fares was eliminated. Carriers can charge whatever fares they desire. Finally, in 1985 the CAB ceased to exist; its remaining functions (e.g., review of mergers, international aviation, consumer protection) were transferred to the Department of Transportation.

3. The Effects of Airline Deregulation

Before describing the changes deregulation has brought to the airline industry, we must address two methodological points. First, when did airline deregulation begin? The simple answer—although too simple—is October 28, 1978 when President Carter signed the Airline Deregulation Act. But, as mentioned above, the CAB began loosening the constraints of regulation as early as 1976. So comparisons that use 1978 as the starting point probably understate the effect of airline deregulation.

The second point is more subtle. Most evaluations of airline deregulation simply compare the industry’s performance “before” with its performance “after” and ascribe the difference to deregulation. In other words, such “factual” comparisons simply compare what was to what is. But, a hidden assumption is the only changes in the industry were those induced by deregulation. There is no question that factual comparisons can be illuminating; most of the comparisons in this

2 Levine (1965).
paper are factual. But one must always ask if something other than deregulation could have contributed to the observed changes.

The way around this problem is a counterfactual analysis, in which what is is compared with what might have been. For example, to see what effect deregulation had on fares, we will compare actual deregulated fares with (an estimate of) what regulated air fares would have been if regulation continued. Since regulated fares never existed in the deregulated era this is counterfactual.

3.1. Market Structure

Contrary to what many people may think, there are more airlines in the industry today than in 1978 when airlines were deregulated. From 1979 to 1991 153 carriers entered the industry and started service. The largest number of new carriers entered in 1979, immediately after the passage of the Airline Deregulation Act in October 1978. However, during the same time, 136 carriers ceased service, either by going out of business or by merging with another carrier. The net effect of entry and exit was that the number of airlines increased from 43 at the end of 1978 to 60 at the end of 1991, with a peak of 87 during 1984. So, a simple count of airlines shows that the deregulated industry has more players than under regulation.

Although a simple count of airlines provides interesting information, counting a large airline as equivalent to a small airline masks the changes that have occurred in the size distribution of firms. This is rectified in Figure 1, which plots the domestic airline industry's four- and eight-firm concentration ratios, frequently used measures of industry concentration. At the time of deregulation, the four largest airlines controlled about 60 percent of total domestic revenue passenger miles with eight largest airlines accounting for about 82 percent. By 1994 this had risen to about 62 percent and 90 percent, respectively. In the intervening years, until early 1985, the industry became less concentrated. But during the second half of 1986 the industry became much more concentrated because of the mergers that took place during that period. There has been a slight downward trend in concentration since mid-1992.

The use of concentration ratios, however, gives a distorted impression of the degree of competition in the airline industry. The output of airlines isn't really revenue passenger miles, that is merely a simple way of aggregating the output of the industry into a single number. Instead of looking at what has happened to competition in the "national market" for revenue passenger miles, we should look at what has happened to competition at the route level. It is at the route level, after all, that airlines actually compete with one another. Measures of the extent of competition at

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3 The "n" firm concentration ratio is the percent of the market controlled by the largest "n" firms. In this case, the market is defined in terms of domestic revenue passenger miles.

4 Although it took less than a year after deregulation for the first two carriers to merge, the great merger wave occurred between June 1985 and October 1987 when fourteen mergers were consummated.
the route level tell a strikingly different story than the other more aggregate measures. In Figure 2 we see that at the time of deregulation in the fourth quarter of 1978 the average domestic airline route had about 1.7-1.8 effective competitors, depending on whether passengers or passenger miles is used to aggregate across routes.\(^5\) These measures of competition rose steadily until mid-1986 when, due to mergers, the number of effective competitors per route declined. Competition at the route level has remained more-or-less steady since about 1991. Using these route level measures, airline competition is now nearly as strong as it has ever been. The divergence of the two measures over time reflects the greater entry that has occurred on long-haul routes relative to short-haul routes.

Another, perhaps more intuitive, way to look at the extent of route-level competition is to see what has happened to the percentage of passengers who travel on “monopoly” carriers (i.e., those with a route market share greater than 90 percent) and those who fly on “competitive” carriers (i.e., those with a route market share less than 20 percent). These measures are reported in Figures 3 and 4. The percentage of passengers captive to monopoly carriers has fallen sharply—from about 28 percent in late 1978 to about 18 percent in early 1994. During that time the percentage of passengers flying on competitive carriers more than doubled, from 7 percent to 15 percent.\(^6\)

Thus, under deregulation there are more airlines, the larger ones control more of the “national” market than before, but they airlines compete against each other at the city pair level more often than nearly ever before.

3.2. Fares

Although it should be noted that there are other aspects of the industry that are also important—service quality, for example—fares occupy center stage in any discussion of the airline industry and deregulation’s effect on it.

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\(^5\) The number of “effective competitors” is the inverse of the Herfindahl index. The Herfindahl index, rather than simply counting the number of carriers in a market, adjusts for unequal market shares by summing the square of each airline’s market share. The Herfindahl index approaches zero in the competitive case with a large number of small firms, and equals one in the monopoly case. If two airlines each had a fifty percent market share on a route, the Herfindahl index would equal \((1/2)^2 + (1/2)^2 = 1/2\). Inverting this gives 2 (effective competitors). Similarly, if there were three unequal-sized competitors, with the largest serving 2/3 of the market and the other two each serving 1/6 of the market, the Herfindahl index would be 1/2, which also translates into 2 effective competitors. Thus, “effective competitors” has a more intuitive interpretation than the Herfindahl index.

\(^6\) Further evidence indicates that 722 of the top 1,000 markets saw an increase in competition (as measured by a decrease in the Herfindahl index) between 1979 and 1988. See Office of the Secretary, U.S. Department of Transportation (1990).
A simple way to look at the effect of deregulation on air fares is to see how air fares have changed relative to the overall price level. This is shown in Figure 5, which plots real airline yield from 1970 through 1993.\(^7\) Real air fares have fallen under deregulation, regardless of when you consider deregulation to have started. As of 1993, air fares were about two-thirds of their level in 1976. Figure 6 takes a disaggregate look at real yields and shows how they have changed by distance from 1978:4 to 1993:4. Fares on routes less than about 800 miles have risen, in a few cases by 30 percent. However, long-haul routes have had decreases of up to 40 percent. These changes in fares were to be expected given the CAB’s attempt to cross-subsidize short-haul fares with long-haul fares.

But can the overall decline in yields shown in Figure 5 be attributed to deregulation? As the figure shows, yields had a downward trend even before the beginning of the deregulation movement. Here a counterfactual comparison would help. The results of such an analysis are shown in Figure 7, which compares the actual (nominal) yield from 1978:4 until 1993:4 with what yield would have been if fares continued to be regulated by the CAB.\(^8\) This curve shows that actual yields have consistently been lower than regulated yields, although the amount has varied greatly over the course of deregulation. The biggest percentage gap occurred during the 1981-82 and 1990-91 recessions. Because airline costs were increasing (due to rising fuel costs), regulated fares (would have) increased. Faced with recession, however, carriers actually lowered fares to attract what business was available. Averaged over the fifteen years in the figure, deregulation has led to fares about 22 percent lower than they would have been if regulation continued. This amounts to annual savings averaging about $12.4 billion (1993 dollars).\(^9\) During 1993 fares were 19 percent lower than they would have been under regulation. Real fares (Figure 5) have declined by about 33 percent since 1976. Thus deregulation has accounted for about 58 percent (19/33) of the observed decline in fares.

Another feature of fares under deregulation that is lost when looking at yields is the change in the distribution of fares charged on any given route. Even occasional air travelers are aware of the array of fares available, ranging from expensive unrestricted coach fares to deeply discounted fares with a host of restrictions. The effect of this variation in pricing is shown in

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\(^7\) Yield is revenue per revenue passenger mile and is the standard measure of average air fares. Nominal yield was converted to real yield using the Consumer Price Index.

\(^8\) Of course, one has no way of knowing for sure what regulated fares would be today. However a good guess can be made with an updated version of the fare formula that the CAB used during the last few years of regulation. See Morrison and Winston (forthcoming).

\(^9\) It should be noted that this figure does not take into account that the lower fares that most travelers enjoy today come at the expense of restrictions (e.g., minimum stay of a Saturday night) that are much more prevalent than during regulation. Morrison and Winston (forthcoming) estimate a fare-class choice model to estimate the cost that restrictions place on travelers. The aggregate annual effect is to reduce the fare benefits noted above by $1.1 billion.
Figure 8, which plots the percentage of air travelers as a function of how the fare they paid compares with the average fare on the route they traveled. As is readily apparent in the figure, fares have become more dispersed since deregulation. In 1978:4 fares on each route were relatively tightly distributed. Fare dispersion increased in both 1985 and 1993.10

In any discussion of post-deregulation air fares, the subject of fares at hub airports always comes up. The nature of a hub necessitates that the hubbing carrier has a large share of airport operations. But will the hubbing carrier also be able to charge higher fares? The answer appears to be yes, although recent research suggests that the hub premium is not as large as previous research indicated.

The U.S. General Accounting Office examined yields at 15 airports where one or two carriers had a large share of total enplaned passengers. They compared the average yield at the 15 concentrated airports in 1988 with the average yield at 38 unconcentrated airports and found concentrated airports had yields 27 percent higher.11 This figure has been widely cited and was partly the basis for legislation to increase competition at concentrated hub airports. However, such a comparison assumes that concentration caused the higher yields and not some other factors. In particular, to zero in on the effect of concentration on price, we must make sure that differences in flight distances, number of connections, and use of frequent flier tickets are taken into account. Further, we must make sure that the comparison airports have the same mix of business and pleasure traffic as the concentrated airports. Finally, we must make sure that any hub premium is, in fact, that: an additional amount a carrier is able to charge at hubs it dominates. Alternatively, the hub premium could be a carrier premium that the carrier is able to charge at all the airports it serves.

Figure 9 shows the results of a study that measured the hub “premium” when these factors were and were not accounted for. After adjustment, the hub premium has been in the 5-10 percent range for several years, much lower than the 27 percent found by the GAO.12

10 It is important to point out that not all this dispersion is due to price discrimination. Some of the dispersion reflects cost-based price differences, for example, peak vs. off-peak fares. Also, business travelers, who pay high fares, have an easier time booking a seat at the last minute than pleasure travelers because the airlines carry a larger “inventory” of seats for business travelers relative to their expected demand than they do for pleasure travelers. The cost of these “extra” seats is reflected in the fares business travelers pay.


12 See Morrison and Winston (forthcoming). Hubs, by their nature, have shorter average flight distances than non-hubs. Thus, all else equal, yields at hubs would be higher than at non-hubs. Passengers flying from hubs require fewer connections than passengers traveling from non-hubs. Since fares for connecting flights are lower than fares for direct flights, all else equal, yields at hubs would be higher than yields at non-hubs. More passengers at hubs fly free using their frequent flier points. Failure to count free tickets makes hub yields appear higher. Eleven of the GAO's
The material presented above indicates that fares have fallen on average but that some fares have risen. Using the methodology used in Figure 7, Figure 10 shows how fares actually paid in 1993:4 compare with an estimate of what regulated fares would have been for the same trips if the CAB continued to apply the fare formula that they used under regulation. Seventy percent of passengers, accounting for 78 percent of all passenger miles, paid fares less than or equal to what they would have paid had regulation continued. However, some passengers (14 percent of passengers, 10 percent of passenger miles) paid fares more than twice what they would have under regulation. This perceived inequity of fares is undoubtedly partly responsible for instances of public dissatisfaction with deregulation.

3.3. Service Quality and Network Structure

Fares have declined, on average, but what has happened to service quality? One aspect of service quality is how easy it is for a traveler to get a seat on the flight of his or her choice. This is (inversely) related to the load factor, the percentage of seats filled. A low load factor means that, on average, travelers will have a relatively easy time getting a seat on their preferred flight. As load factors increase, travelers face an increasing probability that the flight of their choice will be sold out, necessitating taking a flight with a less preferred departure time. As shown in Figure 11, load factors have increased under deregulation, although there was a trend in that direction in the early 1970s.

Although average load factors have increased, this has not been uniform across routes. In particular, Figure 12 shows average load factor as a function of distance for 1978 and 1993. Load factors have decreased for flights less than 900 miles and have increased for flights greater than about 1200 miles. This was expected. Under regulation, because fares were set below cost for short routes and above cost for long routes, airlines responded by reducing flight frequency on short routes and increasing flight frequency on long routes. With the lifting of pricing regulation, airlines responded by raising fares for short routes and (relative to the lower demand) increasing the frequency of service, resulting in a lower load factor. On long routes, airlines lowered fares and reduced frequency (relative to the higher demand), resulting in increased load factors.

Another change that is receiving a lot of attention is the increased reliance on hub-and-spoke route structures under deregulation. Although, as shown in Figure 13, the percentage of passengers who take connecting flights has only increased from about 28 percent in 1978 to about 32 percent in 1994, a dramatic change has occurred in the nature of those connections. In 1978 slightly less than half of all connections were interline connections, where passengers change airlines as well as planes. Today, interline connections have all but

38 comparison airports are in California, Nevada, Arizona, and Florida, which are likely to have a higher percentage of pleasure travelers than the 15 concentrated airports. Finally, some of what appears to be a hub premium is, in fact, a carrier premium, charged by the hubbing carriers at all airports they serve.
disappeared and have been replaced by online connections, which passengers prefer, where passengers change planes but not airlines. Only about two percent of travelers now make interline connections. But most important of all, the hub-and-spoke route structure gives passengers—from spokes and from the hub—more frequent service than would be possible with single plane service. Because passengers bound for many destinations are flown in the same plane, more frequent service is possible than with single plane service. In fact, one study of deregulation found that about two-thirds of the benefits to passengers from deregulation were from increased frequency of service made possible by the hub-and-spoke route structure.\textsuperscript{13}

Figure 14 shows the change in average aircraft size that has accompanied the evolution of the hub-and-spoke system. On average, smaller aircraft were used on short routes (less than 300 miles) in 1993 than in 1978. With one exception, larger aircraft were used on routes from 300 miles to 2200 miles. Again, with one exception, smaller aircraft were used on long routes (more than 2200 miles). Finally Figure 15 shows how actual flight time (for non-stop flights) has changed since 1978. Both ground and air time have increased so that in 1993 the average flight segment took nine minutes longer than in 1978. This is presumably due to airport and airway congestion, although slower cruising speeds might also contribute to the greater air time.

3.4. Employment

Figure 16 shows the trend in airline industry employment from 1970 to 1993. Employment was steady from 1970 to 1976 when it began to increase. After a dip caused by the recession in the early 1980s employment increased dramatically and has leveled off since 1990. Employment in 1993 was about 80 percent larger than in 1976. However, these changes at the aggregate level mask what happened at the individual carrier level as employees were hired during expansions and laid off during downturns. For example, Continental Airlines' employment fell by more that 5 thousand workers during its first bankruptcy (although employment was greater when it emerged from bankruptcy in 1986 than when it entered in 1983). Trans World Airlines shed about 6 thousand workers during its time in bankruptcy. Of course, when an airline goes out of business, all employees lose their jobs. The most significant cases of this type are Eastern and Pan American Airlines. At their peak, Eastern had about 44 thousand employees (1987) and Pan American had about 32 thousand workers (1981). They now have none. Of course, it is difficult to say if deregulation caused this. Both these airlines had financial problems before deregulation in 1978.

Airline workers are well paid relative to U.S. workers in general earning an average (total compensation) of $52,188 in 1992 compared with $34,536 for all workers. However, the earnings gap has been closing. Since 1980 (nominal) total compensation of airline workers has increased at 3.9% per year while total compensation for workers in general has risen 5.2% per year.

\textsuperscript{13} Morrison and Winston (1986).
3.5. Investment
Airline investment in physical assets (largely flight equipment) has expanded rapidly since deregulation. From 1977 to 1994 airline physical assets (in constant 1994 dollars) more than doubled from $24.5 billion in 1977 to $55.8 billion in 1994.

3.6. Profitability
Figure 17 shows the operating profit margin for U.S. scheduled airlines. Operating profit margin expresses operating profits (operating revenue minus operating cost, which excludes interest and taxes) as a percentage of operating revenue. As the figure makes clear, the industry is a cyclical one. During the recession of the early 1980s industry operating profits were negative. They recovered in 1983 and 1984 and then hovered in the 3-5 percent range. The years 1990-92 saw negative operating margins. Improved, but poor, performance occurred in 1993. However, these industry averages hide wide variations in profitability among firms. In 1989 operating profit margins ranged from -56 percent at Eastern Airlines (which went out of business in early 1991) to 10 percent for Southwest Airlines.

3.7. Safety
The subject of airline safety invariably comes up in any discussion of airline deregulation. But safety was not deregulated. Safety standards continue to be enforced by the Federal Aviation Administration. However, some people believe that increased competition in a deregulated marketplace will cause airlines to be less safe by skimping on maintenance or by hiring less experienced pilots. Others counter that without the protection from competition afforded by regulation, a carrier that was unsafe (or even perceived to be unsafe) would not survive in a regime of free entry by other carriers. Both views make sense. Ultimately, it is an empirical question. What has happened to the safety record of airlines since deregulation? Figure 18 shows the probability of an airline passenger dying in an airline accident from 1975 to 1993. The safety record of airlines continues to improve in the deregulated era.  

4. Possible Trouble Spots
This section examines several areas that have been identified by some observers as possible areas where deregulated competition has led to (potential) problems that might warrant increased scrutiny by the government.

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14 It cannot be ruled out that the accident record would have improved even more if airlines were still regulated. This question could, in principle, be answered using a counterfactual model of airline safety. However, developing such a model would be extremely difficult. Nonetheless, it is true that air travel is safer than it used to be.
4.1. Frequent Flier Programs

Frequent flier programs began in May 1981 when American Airlines began its Advantage program. It was 1986, however, before all major airlines had one. In such programs, airlines award points for each mile a person travels. Once a specified number of miles have been accumulated, a member of a frequent flier program can redeem his miles for free travel or an upgrade to another class of service.\(^\text{15}\) According to Stephenson and Fox (1987) in 1985 approximately 10 million people—accounting for 70-75 percent of business travelers—belonged to at least one frequent flier program. Bryant (1994) reports data from Inside Flyer magazine that by 1993 membership in frequent flier programs totaled 30 million people with 1.7 trillion accumulated miles in their accounts. Figure 19 shows how the use of frequent flier tickets has grown over the years. The figure shows the percentage of U.S. domestic air travelers flying on zero fare tickets.\(^\text{16}\) If we consider the level of zero tickets during 1978-86 to reflect free travel by airline employees and coding errors and not frequent flier travel, since 1989 about 4 percent of travelers and 6 percent of passenger miles were free frequent flier trips. This understates the importance of frequent flier programs because it excludes those travelers who use their miles for free upgrades rather than for free travel.

It appears that by any number of measures frequent flier programs have assumed a large importance in deregulated airline competition in the United States. The policy question, however, is whether these programs are a benign marketing device or whether they distort competition. At first blush, frequent flier programs may appear to be a form of quantity discount—airlines reward their good customers with free travel. However, as Levine (1987, p. 452) points out, although this characterization may be accurate for pleasure travelers it is not for business travelers because pleasure travelers pay for their own tickets but business travelers do not. Frequent flier programs for business travelers are an attempt to exploit the “principal-agent” problem: the agent (the business traveler) makes travel decisions that are not in the best interest of the principal (his or her employer). Even so, does this distort competition? The answer appears to be yes for two reasons. First, large airlines, with their large route systems, give travelers a greater opportunity to earn miles and also have a more diverse set of destinations to offer when the traveler accumulates enough miles to earn an award. Consider, at one extreme, the disadvantage faced by an airline that serves only one destination. Having accumulated enough miles for a free trip the traveler is rewarded with another trip to the same place! Small carriers could join forces with other small carriers or

\(^{15}\) As the programs have evolved, non-airline companies have become affiliated with frequent flier programs. Today, frequent flier miles can be earned at hotels, rental car agencies, and long distance telephone companies, to name but a few. Likewise, frequent fliers can redeem their mileage for awards other than air travel: merchandise, donations to charity, and ocean cruises are examples. See Bryant (1994).

\(^{16}\) Because zero fare tickets include free travel by airline employees and (airline) coding errors, not all of these travelers are frequent fliers.
larger carriers to offer a more attractive package, but this involves transactions costs that may still
place them at a disadvantage. The second feature of frequent flier programs that gives an
advantage to large carriers is the non-linear award structure. By concentrating one’s flying on one
(large) airline, a traveler becomes eligible for more attractive awards as his mileage accumulates.
(Recently, carriers have placed expiration dates on earned mileage, making it more important to
stick with one airline and also limiting the value of programs to non-frequent travelers.)

The arguments above are fine, as far as they go, but ultimately it is an empirical question
as to whether frequent flier programs influence traveler choice and, if they do, to what extent do
they distort competition by giving an artificial advantage to larger carriers. The first question is
addressed in Table 1, which shows the results of a survey of travel agents conducted by the U.S.
General Accounting Office. The results indicate that 81 percent business travelers choose flights to
build frequent flier miles more than half the time.

Morrison and Winston (forthcoming) attempt to answer the second question by quantifying
the effect that frequent flier programs have on airline competition among U.S. airlines. Many
people’s presumption is that large carriers would lose from eliminating frequent flier programs and
small carriers would gain. The results in Table 2 show that this is only partly true. If frequent flier
programs were eliminated, American Airlines, the largest carrier, would lose the most, amounting
to nearly 18 percent of its passengers. Midway and Alaska, the two smallest carriers that were
included in the study, would gain the most, 23 and 32 percent, respectively. Other results, however,
are not consistent with conventional wisdom. United Airlines, the second largest carrier, would
actually experience a modest gain in market share. This is because, although United is a large
airline, it competes against American Airlines—also a large airline—on many of its routes. On the
other hand, TWA, a relatively small airline, would lose 15 percent of its market. A general
conclusion from this exercise is that large carriers benefit from frequent flier programs other things
equal, but other things are often not equal. Small carriers can be helped or hurt by frequent flier
programs, as can large carriers.

Other work has reached conclusions in basic agreement with the premise that large
airlines are advantaged by frequent flier programs. In a paper focusing on (large) airlines that
dominate certain hub airports, Borenstein (1991, p. 1260) found that the advantage a dominant
carrier at airport has on the routes it serves from that airport seems to be greatest among business
travelers, which he believes comes from frequent flier programs (which should have a greater effect
on business travelers). In its report on the effect of marketing devices on airline competition, the U.S.

\[17\] Their study was based on a survey they commissioned of airline passengers that collected
information about air travel choices made by 169 travelers during three months in 1990. The
authors then estimated a multinomial logit model of airline (and routing) choice based on travelers’
membership and accumulated miles in frequent flier programs, along with fare, travel time,
frequency of departures, and other control variables. The estimated choice model was then used to
simulate how the elimination of frequent flier programs would affect airline market shares.
Department of Transportation (1990, p. 41) concluded that frequent flier programs influence choice and give an advantage to large carriers. Levine (1987, p. 454) summarizes the importance frequent flier programs by concluding that for a new entrant operating on a small scale frequent flier programs are “a major obstacle rather than a mere marketing detail.”

It seems clear that frequent flier programs represent an artificial economy of scale that can, but need not, advantage large carriers and disadvantage small ones.

4.2. Computer Reservation Systems

The first commercially successful airline computer reservation system (CRS) was American Airlines’ Sabre system introduced in 1976. United’s Apollo system was introduced later that year. The rapid development of computer technology combined with the proliferation of fares under deregulation has led to the increased importance of CRSs and travel agents. The U.S. Department of Transportation (1990, pp. 1, 12) reports that the percentage of tickets sold by travel agents increased to about 80 percent in 1988 from 38 percent in 1977. Today there are four CRS systems in the United States, the two largest being Sabre and Apollo, which in 1988 had a combined 66 percent (revenue) market share (U.S. Department of Transportation, 1990, p. 51).

Because of the importance of CRSs in airline bookings, virtually all airlines (the notable exception being Southwest Airlines) list their flights on all four CRSs. Although CRSs allow small carriers to have their flight offerings displayed throughout the world, they also appear to give an advantage to the carriers that “host” them (U.S. National Research Council, 1991). Three issues relating to airline competition emerge from the current (and past) functioning of the CRS market: display bias, incremental revenue, and booking fees.

CRS systems initially were programmed to display the flights of their host carrier more prominently than for other carriers by, for example, placing them on the first screen of flights. Since a large fraction of flights are booked from the first screen, this gave an apparent advantage to the host airlines. In the U.S. screen bias was outlawed by the Civil Aeronautics Board in 1984. However, airlines hosting CRSs still appear to have an advantage over non-host carriers in that they receive “incremental revenue,” i.e., revenue greater than one would predict if the carrier did not host a CRS. Incremental revenue is attributed to the “halo effect,” which may be due to several factors. One is so-called “architectural” bias in the computer reservation systems. According to the U.S. Department of Transportation (1990, p. 46) architectural bias (may) arise because travel agents have greater confidence in the accuracy of the host airline’s information and because it (may) take less time for the agent to book a traveler on the host carrier’s flights. Also, CRS vendors offer (software) enhancements that favor the host airline. Another explanation for incremental revenue is the ongoing business relationship between the CRS host and travel agents may make the agents more likely to book on the host airline (U.S. National Research Council, 1991, p. 148). Whatever the cause of the halo effect, the U.S. Department of Transportation (1988)

18 The host of a CRS is the airline whose internal reservations computer is the one used for the CRS.
concludes that the halo effect “exerts a large influence on travel agency booking patterns.” The DOT concludes that CRS owners earn between 12 and 40 percent more revenue (from travel agent bookings) than they would if they were non-owners. The DOT (p. 64) estimates that incremental revenues for all vendor airlines amounts to roughly $2-3 billion dollars.\textsuperscript{19}

Morrison and Winston (forthcoming) used a multinomial logit model of airline (and routing) choice to simulate the effects of architectural “bias” on travelers’ choices. They modeled architectural bias as (effectively) eliminating from consideration air carrier choices that travelers would face in the absence of bias. In their simulation, Morrison and Winston randomly eliminated one carrier from each traveler’s choice set under three different scenarios. Since the choice sets in the model contained three or four randomly selected alternatives that travelers faced, their procedure amounts to eliminating from consideration 25 to 33 percent of travelers’ choices. Having eliminated a carrier from the choice set, Morrison and Winston calculated the loss in passenger welfare (for pleasure and business travelers), the gain in revenue to carriers, and the deadweight loss—the difference between the losses to travelers and the gains to carriers. These results are shown in Table 3. In the base case, which Morrison and Winston consider the most reasonable of the three, travelers lose $434 million annually (split 32 percent for business travelers and 68 percent for pleasure travelers). Carriers gain $88.5 million for a deadweight loss of $345 million. To put these figures in perspective, U.S. domestic passenger revenue in 1990 was $46 billion. Table 4 shows the base case’s $88.5 million revenue change by carrier. At the extremes, American, whose holding company owns Sabre, gains nearly $200 million, while USAir loses nearly $50 million. Although Morrison and Winston consider their base case to be the most reasonable of the three presented, they argue that it most likely overstates the magnitude of the welfare loss and transfer for two reasons. First, corporations increasingly hire firms to “audit” their travel agents to make sure that employees’ travel choices are consistent with corporate travel policy. Second, they point out that according to the Air Transport Association, in 1993, 8 percent of air travelers accounted for 44 percent of all air trips. It seems unlikely that such experienced air travelers would not be aware of all the options they had for a given trip.

Whatever the size of the halo effect, rapid change in computer technology and the increasing extent of multiple airline ownership of CRSs, seem likely to work to reduce its importance. The U.S. Department of Transportation (1990, p. 70) concludes the extent of advantages to host airlines due to architectural bias appears to be diminishing.

Another issue of concern is the booking fees that CRSs vendors charge airlines for each of their flight segments booked. The U.S. Department of Transportation (1990, p. 56) reports that

\textsuperscript{19} Borenstein (1992, p. 64) argues that the size of incremental revenue is probably overstated because studies do not control for related factors like frequent flier programs, commission incentives, an airline’s reputation in the local area, etc. In a related study, Borenstein (1991, p. 1260) found only a small effect (that is difficult to distinguish from the effect of other variables) of CRS dominance in a city on the route share of the hosting carrier (other things equal).
booking fees are about $2.00 per trip segment, which is about twice the cost of providing the service. Smaller carriers (non-owners) complain that this puts them at a disadvantage. Since booking fees are about two percent of airline costs, a 100 percent markup on booking fees puts non-owner airlines at a one percent cost disadvantage. This is not much, but the airline industry is a low margin industry so even one percent could mean the difference between success and failure for some airlines.  

On the other hand, Kleit (1992) argues that "biased" displays and (high) booking fees are not symptoms of market power on the part of CRS vendors. He argues that "display" preference is common in other part of the economy (e.g., newspaper ads, grocery stores) and allows airlines to buy the kind of position on the CRS display that best suits their marketing strategy. He also argues that comparing booking fees to costs is inappropriate because CRSs provide benefits to both travel agents and airlines. Kleit argues that the system of charging airlines high fees and travel agents low fees is simply a way to allocate the joint costs involved in a way that minimizes transactions costs.

4.3. Travel Agent Incentives

When airlines were regulated in the United States, travel agent commissions were also regulated at a fixed percentage of the fare charged. Rebates were prohibited so competition among airlines for travel agents was suppressed. Deregulation changed that. Carriers are now free to negotiate their own commission schedules with travel agents. Figures 20 and 21 document the increased importance of travel agent commissions in airline competition since deregulation in 1978. Figure 20 shows the (real) commission paid per revenue passenger mile from 1970 through 1993. Real commissions have doubled since 1978 from about 0.8 cents per RPM to about 1.6 cents. As is apparent from the figure, there was an upward trend even before deregulation so it is no doubt the case that all of the increase cannot be attributed to deregulation. Figure 21 shows commissions as a percentage of fare revenue. This has risen steadily, once again, beginning before deregulation. In 1993 commission payments averaged 12 percent of fare revenue, up from 4-5 percent in 1978. By way of comparison, advertising and promotion expenses for U.S. airlines were 4.32, 2.72, and 1.91 cents per revenue ton mile in 1970, 1978, and 1993 respectively (all figures in 1993 dollars). During that same period advertising and promotion expenses as a percent of cash operating expenses fell from 2.7 percent to 1.6 percent. Once again, it is difficult to tell how much of this is due to deregulation and how much would have happened

20 However, it must be considered that the booking fees may themselves be a response by CRSs to government regulation banning display bias. Before 1984 when Civil Aeronautics Board rules against display bias went into effect, the CAB found that booking fees and travel agent equipment rentals were not covering CRS costs. Yet the larger systems were profitable because of incremental revenue that the airlines received (DOT, 1990, p. 78).

21 These figures are calculated from data in Air Transport Association, Airline Cost Index.
It is nonetheless true that today traffic commissions are more important and advertising less important than they were in the past.

However, rather than simply raising the rate of commission paid on each ticket, airlines have begun paying a base commission rate augmented by override commissions if certain goals are met. Override commissions can be as high as ten percent but usually the maximum rate is around 5 percent (U.S. Department of Transportation, 1990, p. 26).

Once again, the question is whether override commissions are merely a new way to compensate travel agents or do they influence agent behavior and thus a client’s choice of airline? If so, do they create an artificial economy of scale that puts small airlines at a disadvantage in competition with large airlines?

The question of whether override commissions affect consumer choice was addressed by the U.S. General Accounting Office (1990, p. 65) which found that 51 percent of travel agents surveyed choose the airline for their clients at least half the time. At least two thirds of agents choose the airline on at least one fourth of the flights they book. The GAO also reports the results of a Louis Harris survey that found that agents choose carriers 41 percent of the time for business travelers and 55 percent of the time for pleasure travelers. The survey also found that 51 percent of travel agents choose a specific airline because of commission incentives at least some of the time. As far as their effectiveness is concerned, one carrier reported to the U.S. Department of Transportation (1990, p. 29) that it receives $12 in additional revenue for each $1 in override commissions.

Thus, it appears that commission overrides are an effective way for airlines to influence travel agent behavior. It also appears that large airlines have structured their overrides to give them an advantage. Levine (1987, p. 433) points out that travel agent incentives are typically non-linear, paying increasing rewards as bookings increase, giving an advantage to large carriers. Likewise, because carriers tend to base overrides on total sales or market share, large carriers are able to offer a more attractive override package than small carriers. On the other hand, corporations have been bypassing traditional agents and setting up in-house travel departments or negotiating directly with airlines. Also, corporations hire auditing firms to make sure that the tickets booked by agents are consistent with corporate travel policy.

5. Summary and Conclusions

The deregulated airline industry continues to evolve, apparently toward a system with a handful of large U.S. airlines serving domestic and international routes, with several smaller specialty carriers that serve particular market niches. The airline industry, like many others, is becoming increasingly global, and a similar evolution of other countries’ carriers is also taking place.

Although most analysts still agree there are no advantages of large scale in producing available seat miles, it has become apparent there are significant economies of scale in marketing
air transportation, i.e., producing and distributing information.

It is true that deregulated airline markets have not evolved in ways that analysts had predicted. However, this by itself does not mean that deregulation was a mistake. The studies of regulated and deregulated markets that have been done in the wake industry deregulations of the late 1970s and early 1980s have led to a greater awareness that both regulated and deregulated markets fall short of ideal performance. Comparisons of perfect regulation with actual deregulation are as empty as comparisons of perfect deregulation with imperfect regulation. Although the tide is turning somewhat, the majority opinion is still that deregulated airline markets, with their imperfections, are better than regulated airline markets with their flaws. Although there is room for disagreement, analysts believe that returning the industry to traditional rate and entry regulation would at best be premature and at worst a mistake. But a belief that some kinds of government regulation are harmful does not indite all forms of government oversight. At a minimum, the role for government in airline markets is to reduce or eliminate those constraints and bottlenecks that limit the ability of carriers to compete against one another.
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