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## BOOK REVIEW

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BUTTON, K. & STOUGH, R. (2000). *Air Transport Networks—Theory and Policy Implications*. Northampton, MA: Edward Elgar. Pp. 377. ISBN 1-84064-429-X. \$95US, hardcover.

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Air transportation is one of the important transportation models expanding its influence to the dynamics of global economy (Wells, 1999). After the US airline deregulation in 1978, the dramatic increase of domestic as well as international aviation services (e.g., passengers and cargos), have shifted the complexity of the aviation system to a higher level (Clougherty, 2000). To date, airlines are encountering more fiercely competitive markets; and inevitably have to maintain a higher intra-dependent network or alliance for lower operational cost (Brueckner & Whalen, 2000) and seamless services (Staniland, 1996), which helps them to better compete with business rivals and survive.

The major tasks of Button and Stough's book *Air Transport Networks—Theory and Policy Implications* are twofold: to interpret air transportation related theories and to examine practical views. The authors, Kenneth Button and Roger Stough, did not aim to examine the merits of engineering development. In fact, they focused on the development of air transportation service, airport infrastructure, network, air freight, and safety issues in relation to policy development and mandates. Because air transportation has contributed an essential section to global economy, this book began with the analysis of airline economics and provided the enthusiastic readers a general idea about the economic importance of air industry.

Chapter two further outlined in detail the contribution of air transportation to the traditional economy such as the interpretation of demand and cost, the logic of pricing, and yield management. Yield management, in particular yield revenue, was regarded as a critical

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dependent variable resulting from the combined calculation of several independent variables such as determined fare, overbooking rate, flight arrangement and fleet optimization. As the authors illustrated, airlines are profit-seeking business. Therefore, yield management played a crucial role in airline operation. Most importantly, because the perspective of airline deregulation was that it could generate profits aplenty, new business rivals wanted to entry. The increased amount of airlines had triggered business competitions—price wars and route adjustment. Thus, in order to attract more passengers, providing lower airfares was the prior tactic after deregulation. In addition, cutting low-profit or no-profit routes was a strategy to reduce operational cost. Although, from the investors' standpoint, implementing price wars and reducing costs were rational, the competing scenario inevitably initiated new policies from the government in order to protect the air service for the public. In particular, those living in remote communities should also share the advantage of air transportation. In fact, two decades following the deregulation in 1978, the net profits of airlines remained extremely low even though there was a dramatic expansion of airline operation. From the perspective of airline operators, strategic alliance has been a major feature to expand service, share facilities and manpower, inter-exchange promotion, stimulate potential demands, reduce operational cost, and ultimately increase net profits.

Air service is a type of network service now. Chapter three outlined the importance of network as well as the introduction of various network models. Via the economic analysis, the authors gave the audiences a big picture regarding the relationship between the airline network and operational cost. The domestic airline network of a specific country was relatively small in relation to the global one. Thus, to mandate a domestic regulation would involve a global correspondence. In the same vein, changes in the format of airline networks cannot avoid the update of related regulations such as the bilateral agreement of the Chicago Convention and the pricing policy of International Air Transport Association (IATA). Moreover, the policy change would not be limited to a singular operational item, but would also contain the other essential factors such as taxation, ownership, competition, licensing, product purchase, and research.

Chapter four demonstrated the concepts of quantitative data usage because quantified information was an important resource for decision making. As stated by the authors, quantitative analysis helped to locate the operational gaps and weakness for government and the industry in order to fix the deficits, to forecast future trends accurately, and to generate better public goods. In other words, data collection should be reliable and trustworthy in order to provide useful results and contribute appropriate ex ante policy decisions and more efficient ex post policy executions.

Chapter five demonstrated three case studies regarding the policy change before and after airline deregulation in the U.S., Canada, and European Union (EU). In the case of the U.S., the author began with addressing aviation reform in the U.S. aviation history prior to 1978. These historical narratives built a solid foundation for airline deregulation. The Airline Deregulation Act of 1978 focused on several major operational areas such as the government's release of regulated pricing, business entry and exit, routes, and the air transportation service to remote community. The short-term impact after deregulation showed a different outcome instead of the predicted situations by policy makers. Instead of a predicted expansion of air service in the late 1970s, the domestic market immediately showed negative effects as illustrated by a shrunken domestic economy, the development of ground transportation, low-fare airlines, and price increases of fuels and wide-body aircraft. In the early 1980s, most airlines still retained their belief as indicated by the dramatic increase of non-stop flights. Therefore, additional capitals were invested to establish more new entrants and consequently created intensive competitions among counterparts. The airports were equally expanded due to the increase of airlines. Yet by mid-1981, because of the increase of fuel price, the expansion of large airlines, and hub airports, the industry saw only a short-term effect and the substantial reduction of air service occurred later on. Pricing strategy wars were another significant factor during the first few years after deregulation; because discount fares were issued and resulted in a dramatic profit reduction. Fortunately, the air transportation safety was improved stemmed from the technology development.

The long term effect has resulted in the increase of commercial operations due to the reduction of airfare and implementation of hub-and-spoke logic. Specially stated by the authors, "fare remained lower in real terms than under regulation" (p.100), but lower-fare strategy had also moved the profit down to the marginal level regardless of passenger expansion. The fierce competition created a playground for price wars but also encouraged business mergers. In addition to the costs of fuels, parts, and labors, the operational expenditures of an air carrier involved other items. Yet they were traditionally ignored such as facility rents, noise abatement costs, safety and risk management, and insurance fees. From the standpoint of policy making, the need for a new policy or policy mandate was mainly determined by the fact of whether "the burden of costs outweighs the benefits generated" (p.109). Unfortunately, "airlines had been overoptimistic in their claims about the service they could offer" (p.109); and the cases of flight cancellations, delays, and customer complaints were increased after deregulation.

Under the bilateral agreement, airlines could expand and connect their domestic flights to international routes based on hub-and-spoke system. However, foreign carriers could not implement the same strategy because this agreement was limited by the U.S. government. In Canada, aviation liberalization was launched a decade after the deregulation in the U.S. Based on the “Canadian gradualism” (p.129), which learned lessons from the deregulation experiences in the US., the Canadian government gradually phased their aviation reforms that augmented to allow more room for the government and more time for the industry to react. Not until the 1980s did the deregulation in Canada occur. The Canadian airlines provided more services in lieu of launching price wars under the fare control from the government. The embracement of *de facto* flexibility in the policy played a guiding role during this period. This *de facto* flexibility, from time to time, loosened the barriers of pricing, competition, slot acquisitions for incumbents. The Canadian airline mergers were inevitable in the late 1980s for cost reduction, powerful market position, and higher traffic density. Then hub-and-spoke system was adopted and combined with the acquisitions of regional airlines by major Canadian carriers for a better feeder service.

In EU, most flights are international within European continent. Countries individually regulated their own aviation in order to protect public interests. The separated airline regulations of individual countries helped to protect the domestic benefit but simultaneously impeded airline alliances. Yet, the barriers were partially removed by a series of legislative activities—domestic reform, bilateral agreements, and Open Skies agreement. Three legislative packages contributed policy mandates in reducing airfare, expanding routes and flights, and ultimately enhancing airline networking across European nations.

Chapter six further expanded these points and focused on the gap of the aviation network. The authors also outlined the gradual development of expanded airline liberalization and the trend of global multi-agreement among airlines. In addition, the impact to environment, safety, and society from multi-agreement was also discussed in terms of required policy negotiation.

The next three chapters have an economic perspective. The authors addressed the impact of the global transport network on airport infrastructures and capacity, market stability, monopoly, and ownership. This discussion helped the aviation audience, in particular, the business investors, to thoroughly understand the economic impact related to market liberalization. Market stability was a critical issue discussed and empirically analyzed by the authors. As argued by Button and Stough, “market liberalization has in general enhanced both the technical and

dynamic efficiency of network industries” (p. 189). Yet, the logic of the multi-agreement in association with liberalization complicated the policy decision in relation to the global network implementation. Airport pricing and infrastructure was no exception. Particularly in Europe, low-cost entrants were an important stimulus in facility usage changing airport policy.

Chapter ten specifically discussed the local economic issues surrounding a hub city. This included the remodeling of a facility, infrastructure expansion, manpower recruitment, navigation system maintenance, taxation collection, and the nearby area’s economic development. An accurate business forecasting could effectively predict a guaranteed benefit and attract investors. A time series trend and multivariate analysis were typically used to demonstrate the economic scenarios centered at a hub city.

Chapter eleven and twelve dictated another important feature of the air transportation—the relationship between airfreight and aviation network. Air cargo increasingly relied on the aviation network due to the success of liberalization, technological developments, and policy reforms. Air freight offered a dynamic interaction, or a de facto dynamics, between shippers and policy makers, between policy makers and liberalization, between liberalization and airport infrastructure, and between airport infrastructure and freight carriers. All of the aforementioned aviation actors, as stated by the authors, “can combine to provide an integrated service to users, or they can act as substitutes and compete for customer’s demands” (Button & Stough, 2000, p. 309).

Chapter thirteen discussed safety and environmental issues under the global alliance. Globalization has made policy making more difficult and complex. To insure the commitment of safety enhancement and environmental protection associated with liberalization and the global alliance, policymaking was regarded critical upholding the proposed safety equation advocated by Button and Stough. Safety related policies among alliance airlines, such as security, passenger service, information availability, management incentive, and lobby power, were primarily discussed. The environmental impacts were also prescribed. Benefits gained from aviation liberation and airline alliance should not outweigh the other issues of air and noise pollution. Unfortunately, although policy makers had a variety of policy instruments dealing with environmental problems, the pursuit of a clean air transportation network were only partially accomplished. Many environmental challenges are still facing policy makers today.

Button and Stough offered a useful interpretation in light of the relationship between airline activities and policy changes. In particular, the

aforementioned three cases proposed by the authors pointed out some important issues. This includes the following areas. The agreement of airline networking should be a slow process. How to make the best usage of airports, fleets, and infrastructure and simultaneously reduce price was and should be always the core question associated with each negotiation across time and location. The regulatory reform from the bilateral agreement regarding the three cases possesses an important challenge to the aviation industry as a global network. From the historical perspective, the authors provided valuable summaries for the readers as they explore and learn about aviation policy reforms. The authors gave a detailed explanation and offered insights regarding the theoretical development of the aviation network and associated policy reforms across time and countries. Technical and economic analyses were especially well explained, which helped readers to adopt genuine concepts affecting aviation liberalization, alliances, and the network. Accordingly, the authors expressed their expertise in a compelling fashion throughout the entire book.

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