Restructuring the Alitalia business model

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ABSTRACT

This paper analyzes the performance of the Italian airline company, Alitalia, after the deregulation in the air transport industry in the European Union. Company performance is analyzed using Tornqvist indices. The evidence shows as Alitalia productivity slowdown has been caused by the company failure to support an increase in input with a supply-oriented strategy.

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1. Introduction

Alitalia has had many financial crises since its foundation in 1946. From the end of 1990s the Italian Government has held 51% of its shares and supported the company through recapitalizations and loans.[1] However, after the deregulation of European airline industry from 1992, several financial crisis and new European laws forbidding State aid, have forced the Italian Government to change its strategy, and to lead Alitalia towards privatization. At the end of 2007 the attempt to sell the 49.9% of the stake to Air France-KLM group has failed. Only December 12th 2008 a consortium of Italian investors bought all the profitable activities of the two main Italian airlines, Alitalia and Air One.[2] The new company, Compagnia Aerea Italiana (CAI), has began operations in January 2009. The recovery plan of CAI, accepted by the Italian labor unions, calls for cutting aircraft, routes, workers, infusion of nearly €1.1 billion and searching for a partnership with a major airline group, possibly as a partner.[3] This paper examines changes in the productivity of Alitalia, from 1992 to 2006, to highlight factors that have negatively impacted on its performance and costs.

Previous studies of Alitalia have mainly focused on comparing the performance of the company with other European carriers (e.g. Gitto and Minervini, 2007; Barbot et al., 2008) or its conduct in trying to

maintain monopolistic power in the new market context (Giannaccari, 2003). We apply the Tornqvist index number to measure the total factor productivity (TFP) from 1992 to 2006 since the other techniques based on the frontier method, parametrically (regression) or not parametrically (linear programming), require data on more than one airline company. Furthermore, the Tornqvist index satisfies many important economic properties (Coelli et al., 2005).

2. Model and data

The TFP index has been widely employed to examine the productivity of airlines. A TFP index is the amount of aggregate output produced by a unit of aggregate input, and is calculated by dividing the logarithm of aggregate output index by the logarithm of the aggregate input index. The aggregate output and the input indexes are computed through the modified Tornqvist index (Caves et al., 1982):

$$\ln \frac{X_t}{X_s} = 0.5 \times \left[\sum_i (w_{it} + \overline{w}_i)(\ln X_{it} - \overline{\ln X_i}) - \sum_i (w_{is} + \overline{w}_i) \right. \\ \left. \times (\ln X_{is} - \overline{\ln X_i}) \right] \quad (1)$$

where X_t and X_{it} are respectively the aggregate output (input) index and the ith output (input) at time t; w_{it} are weights and a bar over variables denotes the arithmetic mean. The weights in the aggregate output index are represented by the revenues shares while cost shares are used as weights in the aggregate input index.

Oum and Yu (1998) and others have looked at productivity changes in airlines using four outputs; passengers service (revenue

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[1] The last aid has been received on 29 May 2008 for an amount of €300 million of euro.
[2] Air One is the second Italian airline in terms of passengers (Ente Nazionale Aviazione Civile, 2007).
[3] Alitalia sold 25% of the company to Air France-KLM for €323 million under a cooperation accord on January 12, 2009.

Table 1
Descriptive statistics.

Variables	Mean	Standard deviation	Min.	Max.
Outputs				
RPK-passenger (10^3)	33 368 223.0	4 951 546.4	23 586 029.0	40 618 183.0
CTK-cargo (10^3)	1 479 196.1	120 951.5	1 298 340.0	1 778 980.0
RPK-charter (10^3)	265 922.5	157 188.8	70 821.9	575 301.0
No-core services (10^3)	6697.6	1655.2	4427.4	9268.7
Inputs				
Labor	19 853.9	2825.3	11 465.6	23 667.0
Fuel (10^3)	667 164.7	90 850.4	462 807.9	777 596.8
Average stage length	1550.1	143.4	1354.8	1910.4
Flight equipment	3847.3	332.7	3134.2	4295.8
Materials (10^3)	14 103.7	2904.8	9374.3	18 717.1

use. The latter is seen as a proxy of capital because it allows the capture of variations in the size and capacity of a fleet. Flight equipment prices are found by dividing leasing, rental and amortization expenses for aircrafts by this measure. Average stage length measures the impact of the network structure on an airline strategy. Its price is treated as traffic and airport expenses divided by average stage length. Finally, materials are the residual airline expenses and for these a quantity index developed by deflating other expenses (differences between operating expenses and labor, fuel, flight equipment, traffic and airport expenses) by a consumer price index.

Economic data is from annual Alitalia reports, and traffic data from the Association of European Airlines and Italian Air Civil
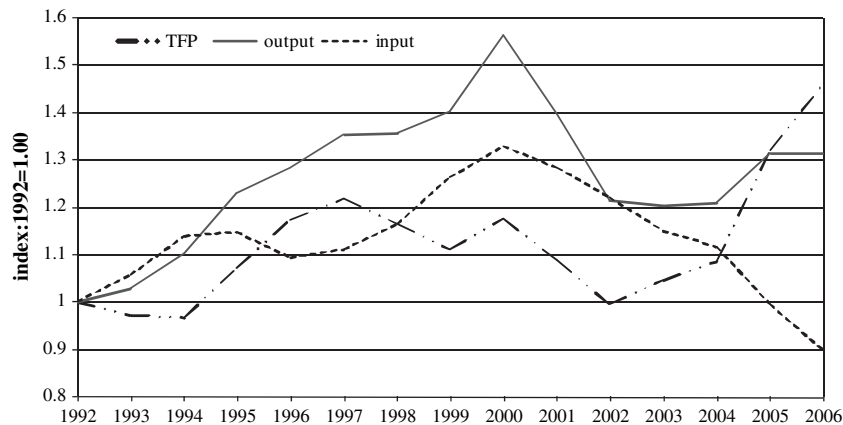

Fig. 1. Total factor productivity, output and input index of Alitalia. 1992–2006.
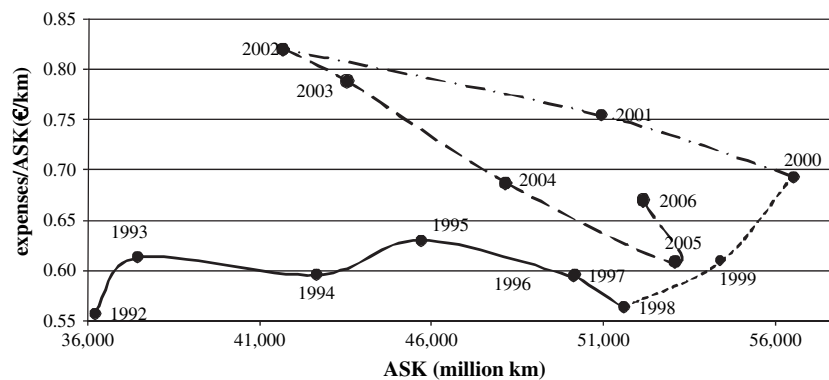

Fig. 2. Evolution of market and costs of Alitalia. 1992–2006.

passenger kilometers, RPK), charter passenger service (revenue passenger kilometers, CRPK), revenue ton kilometers, (RTK) of scheduled cargo services and non-core services.[4] To incorporate no-core services we use a quantity index constructed by dividing no-core revenues by a consumer price index.

Five inputs are used; labor, fuel, flight equipment, average stage length and materials. Labor is full time equivalent employees, fuel is measured in gallons of fuel consumed, and flight equipment is an index formed by multiplying the typical volume payload of each type of airplanes by the frequency of its

Authority (Ente Nazionale Aviazione Civile, ENAC). Fleet composition is obtained from annual reports and technical information on airplanes from the producers' websites (Table 1).

3. Results

Fig. 1 shows the evolution of Alitalia's TFP and its components: the output and input indices.[5] After the EU airline liberalization process from 1992, Alitalia productivity rose until 1997: an increase of about 17%. This can largely be explained by the increases in the market for air transport (30%) combined with improved efficiently

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[4] This includes all non-airline business activities, such as ground handling, aircraft maintenance, and airport and technical assistance.

[5] TFP index has been obtained through TFPIP software (Coelli et al., 2005).
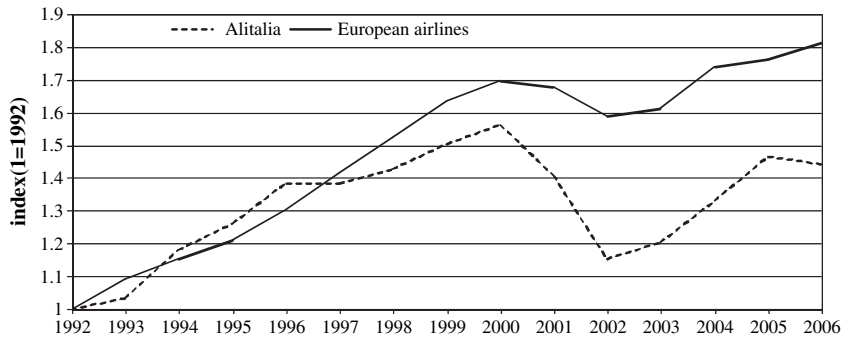
Fig. 3. ASK evolution: Alitalia and main European airlines (Air France, Lufhansa, KLM, British and Iberia). 1992–2006.
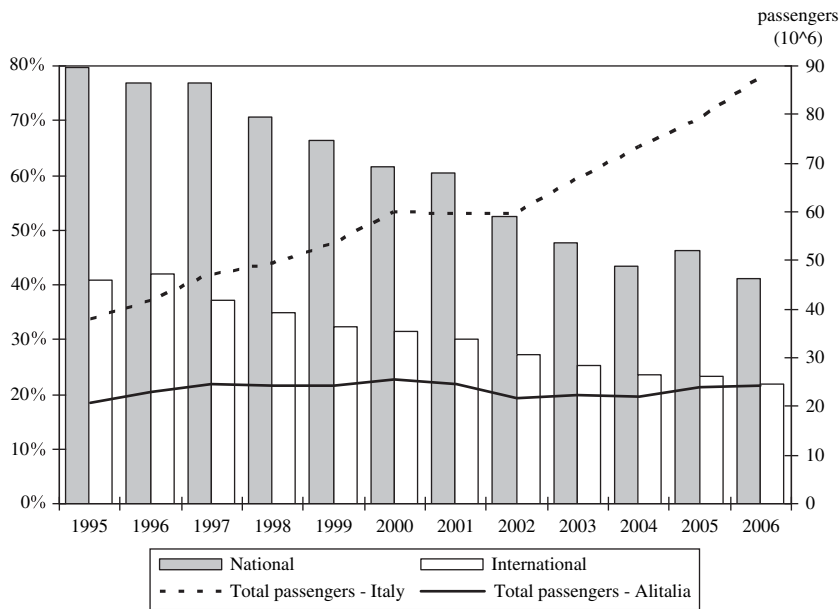

Fig. 4. Evolution of market share and Alitalia passengers numbers, 1995–2006.

stimulated by increased competition (Oum et al., 2005). After 1997, a slowdown in productivity index occurred, but from 2002 TFP rose again. This analysis relies only on the physical components of an airline production process, leaving aside production cost. To embrace this supply is measured by available seat kilometer (ASK) with a unit cost index obtained by dividing aeronautical expenses (personnel, fuel, airport and traffic, amortization and leasing) by the ASK (Fig. 2).

The unit cost analysis, in line with previous studies, involves a number of distinct phases. The first one, from 1992 to 1998, has been characterized by a growth of supply at constant unit cost. In the second phase, started in 1998, the slow market growth is joined to a rapid increase in unit production cost. From 2000 to 2002 (third phase) the rapid decrease in ASK has been source of a rapid cost increase. Only in the fourth phase, started in 2002, new growth of ASK has produced a positive impact on unit production cost.

The evidence is strictly linked to business decisions made by the company and actions of the Italian Government in the new liberalized institutional environmental. Until 1997, Alitalia's ASK trends along with the main European airlines (Fig. 3). But one year later it adopted a strategy of reducing its growth rate and opening a second hub at Milano Malpensa; this was essentially a Government decision. A network configuration deploying two closely located hubs is

not common in air transport. For example, Air France-KLM and few American carriers, have two hubs, but they have huge markets in terms of destinations and traffic. At the end of the 1990s Alitalia was a hub-and-spoke operator but with problems of supporting a supply-oriented strategy aimed at reducing its unit production costs (Gitto and Minervini, 2007). In many other cases airlines at this time were expanding their markets through mergers and strategic alliances (Fan et al., 2001). After the failed merger in 2000 with KLM, Alitalia only gradually engaged in strategic from 2001, when it joined Skyteam consisting of Northwest, KLM-Air France, Continental, Delta Airlines, Korean Air, Aeromexico, CSA Czech Airlines and Aeroflot. Finally, in the domestic market, Alitalia has adopted potentially anticompetitive tactics[6] seeking to limited new market entry by its control over airport slots, by code-sharing agreements to increase fares, and by offering commission to travel agents to discriminate in its favor.

The high cost structure of the airline did not allow it to maintain its market share in either national or international markets (Fig. 4). In the domestic market, Alitalia suffered from competition as new

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[6] Italian Antitrust (Autorità Garante per la Concorrenza e il Mercato, AGCM) decision n.2169 in 1994, n.4398 in 1996, n.6793 in 1999, n.9693 in 2001, n.10981 in 2002, n.11038 in 2002 (see also AGCM, 2005).

Italian carriers emerged; while on international markets in Europe and Asia between 1996 and 2006 it lost −14.8% and −10.6% of its market share (Ente Nazionale Aviazione Civile, 1999–2007). On routes between Italy and America, restrictive bilateral agreements offered some protection to its market share.

4. Conclusions

Index numbers indicate that the growth in productivity of Alitalia between 1992 and 2006 slowed down after 1997. In part this was linked to a clear strategy in terms of its hub at Milano Malpensa, but the company also suffered in the domestic market from increased competition and was sluggish to react, often seemingly more interested in preserve its existing position than pursuing new markets. In the international arena, the failure of the agreement with KLM in April 2000, only partially compensated for by participation in the Skyteam alliance, limited the capital expansion that had started in 1990s. The more recent moves involving privatization and consolidation of the domestic market may provide at least a short-term respite for the company.

Acknowledgements

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