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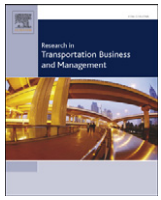

Evolution of the intellectual structure of research on pricing strategy of low cost carriers

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ABSTRACT

Low Cost Carriers played a significant role in the evolution of air passengers transport industry. Many researchers showed how, since the first experiences of Southwest and the leading role of Ryanair and EasyJet, the dynamics of pricing contributed to modify behaviors of customers, competitors and other stakeholders. Furthermore, the liberalization of markets enhanced these effects, still requiring a certain degree of support from governments and regulators. Even if lesson learned from the most successful cases can help to identify some general results and specific drivers of success, a general framework to describe and explain the role of different contributions and experiences is missing. This paper offers an extensive and complete literature review on Low Cost Carriers' pricing policies, strategies and practices to identify current and modern trends, trying to answer to the still open research questions in the field. By the application of Factor Analysis and Multi-Dimensional Scaling, this paper identifies the main streams of research and address potential future directions.

1. Introduction

Even considering the pioneering experiences that followed the Airline Deregulation Act of 1978, it is in the last two decades that the development of Low Cost Carriers (LCCs) played a significant role in the evolution of air passengers transport industry. LCC seats represented 26.3% of all seats worldwide in 2013, with peaks of 57.7% in Southeast Asia and 58.4% in South Asia (Pearson, O'Connell, Pitfield, & Ryley, 2015). Although the US Southwest developed the first LCC model in the 1970s, only in the 1990s LCCs became a wider phenomenon, with the birth of Ryanair in 1992 and EasyJet in 1995.

The traditional approach of LCCs used to rely on a general set of service features, such as on-line booking system and no free in-flight comfort, using homogeneous fleets and secondary airports. However, this business model evolved over years, adjusting to the development of customers, industry, market and regulations. The analysis of successful cases becomes thus relevant to highlight the adoption of different policies, strategies and practices, according to specific management choices.

As the LCCs' ability of adjusting prices represents their core business factor, this article aims to investigate this specific research domain to understand the characteristics of LCCs, the reasons behind their spread and success and, lastly the effects in the market. This paper, by reviewing twenty years of literature from 1996 to 2016, aims to describe the evolution of LCC business models, with particular reference to their pricing policies, strategies and practices, along with the relationships with customers, market and concurrent carriers. It aims to understand the current state of the art of this research stream and the potential future directions. To this purpose, we adopted a groundbreaking and robust methodology, based on the bibliometric method of co-citation analysis, to ensure objectivity in the review and identify the intellectual structure of the research field.

The paper illustrates a methodology that, after a systematic search and through a co-citation analysis, shows the evidences that arise from the most relevant academic journals. The results of the study highlight six sub-domains, which address six different streams that will be discussed in terms of implications, limitations and future evolutions.

2. Methodology

The co-citation analysis is a method to analyze links among articles contributing to the same research field with the aim to uncover its intellectual structure (Shafique, 2013) and to recognize patterns within a research field (Di Stefano, Gambardella, & Verona, 2012). The main idea of this bibliometric technique is that the more two articles are cited together, the more they should belong to the same sub-research stream, even if they do not come to an agreement (Annarelli & Nonino, 2015).

The first stage of the methodology is a full research of all the papers in the scope (e.g. articles related to LCCs pricing policy, LCCs pricing strategy and LCCs pricing practices in all of the research subfields relating to management, business, economics and social science). After the identification of the set of articles, two different multivariate techniques

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identify and characterize the intellectual structure: factor analysis and multidimensional scaling. The factor analysis is a data reduction technique for emerging a research fields' underlying structure, according to various degree of relationship among the papers (Pilkington & Meredith, 2009). Factor analysis categorizes the articles in factors that represent groups of publications that may belong to fields, subfields or a core set with commonalities. Multidimensional Scaling (MDS) depicts graphically the conceptual proximity between the publications and it is useful for a better understanding the state of art (Ramos-Rodríguez & Ruíz-Navarro, 2004).

2.1. Searching and selecting the articles

The scope of the literature research is the Scopus database, limited to academic articles in English published or accepted until the end of 2015, including those published in 2016 but accepted in 2015. Consequently, we performed a systematic search in the database using the ("Low Cost Carrier" OR "Low Cost Airline" OR "Discount Carrier" OR "Discounted Carrier" OR "Low Fare Carrier" OR "Low Fare Airline" OR "New Entrant Carrier") AND ("pricing" OR "price") in the fields: "title, abstract, keywords", finding 417 documents (413 in English) that mainly refers to the subject areas of "Business, Management and Accounting", "Social Science", "Decision Sciences", "Engineering" and "Economics, Econometrics and Finance". As a final step, we performed a full-text analysis in order to select only the articles in the specific research domain of air passengers' transport; as well as papers with complete references, obtaining a set of 360 articles.

The topic of pricing strategy is attracting great research interest starting from 2009, as confirmed by the growing trend of the number of articles in the last 5 years (Fig. 1). Although the first paper is in 1992, the significant increase of the number of paper in academic journals or conferences started from the biennium 2003–2004.

2.2. Identifying the core structure

Co-citation analysis requires counting the frequency a selected pair of works is cited together.

First, a citation matrix of the full set of 360 papers reports, in rows and columns respectively, the cited papers and the citing papers. Then, a co-citation matrix reports the co-citations frequencies where rows and columns are the articles in the set, while cells represent the number of times each pair of papers has been cited together. Through the co-citation matrix, it is possible to exclude a group of papers not cited together with any other paper, reaching a core set of 156 papers (Table 1).

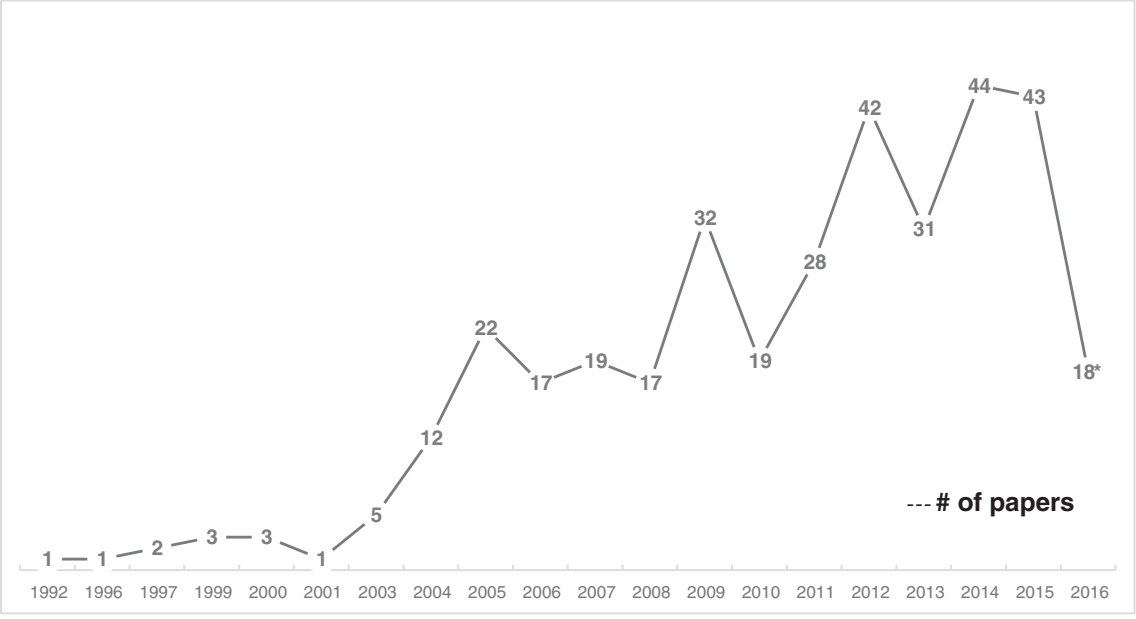
The next step creates a matrix of Pearson's correlation coefficients from the 156 × 156 matrix of co-citation frequencies. Correlation represents a measure of similarity between two works: the higher the positive correlation, the higher the similarity between the two (White & McCain, 1998). Moreover, correlation coefficients are preferable to co-citation frequencies because the data are standardized and the number of zeros reduced, thus providing a better basis for statistical analyses (Rowlands, 1999). The correlation matrix is the input of the multivariate techniques, factor analysis and multi-dimensional scaling, to generate and interpret findings.

3. Findings

3.1. Findings from systematic literature search

Paper not cited are 106 (the 29,44% of the total), while 98 papers, even if cited, have never been cited together with any other paper in the panel of 360. Table in Appendix A shows that the full set of articles presents 3359 citations from the Scopus database with an average number of citations per paper of 9.33. The 156 papers of the core set received 2935 citations (87% of the total) with an average number of citations per paper of 18.81. The 360 papers were published in 156 journals, conferences or books, while the core set refers to 45 journals. In particular, the most frequent are Journal of Air Transport Management (57 papers), Journal of Transport Geography (15 papers), Transportation Research Part E: Logistics and Transportation Review (13 papers) and Tourism Management (10 papers).

Papers published by Journal of Transport Geography received an average number of citations of 28.87, Journal of Air Transport Management 20.54, Tourism Management 20.20 and Transportation Research Part E: Logistics and Transportation Review 17.31. Econometrica has the higher average number of citations but this value derives from only one paper that is also the most cited (115) of the set, i.e. "Market



*accepted in 2015 and published in 2016

Fig. 1. Selected publications per year.

Table 1
The core set of the article.

ID	Authors, year	Title	Source Title	# citations	Factor
234	Ciliberto and Tamer (2009)	Market structure and multiple equilibria in airline markets	Econometrica	115	2
300	Dobruszkes (2006)	An analysis of European low-cost airlines and their networks	Journal of Transport Geography	110	1
358	Dresner et al. (1996)	The impact of low-cost carriers on airport and route competition	Journal of Transport Economics and Policy	102	2
342	Franke (2004)	Competition between network carriers and low-cost carriers - Retreat battle or breakthrough to a new level of efficiency?	Journal of Air Transport Management	85	1
346	Francis, Fidato, and Humphreys (2003)	Airport-airline interaction: The impact of low-cost carriers on two European airports	Journal of Air Transport Management	75	1
341	Gillen and Lall (2004)	Competitive advantage of low-cost carriers: Some implications for airports	Journal of Air Transport Management	75	1
352	Barrett (2000)	Airport competition in the deregulated European aviation market	Journal of Air Transport Management	70	2
336	Francis, Humphreys, and Ison (2004)	Airports' perspectives on the growth of low-cost airlines and the remodeling of the airport-airline relationship	Tourism Management	69	1
304	Francis, Humphreys, Ison, and Aicken (2006)	Where next for low cost airlines? A spatial and temporal comparative study	Journal of Transport Geography	64	1
215	Adler, Pels, and Nash (2010)	High-speed rail and air transport competition: Game engineering as tool for cost-benefit analysis	Transportation Research Part B	61	2
351	Mason (2000)	The propensity of business travellers to use low cost airlines	Journal of Transport Geography	61	1
186	Merkert & Hensher, 2011	The impact of strategic management and fleet planning on airline efficiency - a random effects tobit model based on DEA efficiency scores	Transportation Research Part A	53	6
349	Mason (2001)	Marketing low-cost airline services to business travellers	Journal of Air Transport Management	52	1
354	Windle and Dresner (1999)	Competitive responses to low cost carrier entry	Transportation Research Part E	49	2
340	Tretheway (2004)	Distortions of airline revenues: Why the network airline business model is broken	Journal of Air Transport Management	46	1
301	Barbot (2006)	Low-cost airlines, secondary airports, and state aid: An economic assessment of the Ryanair-Charleroi Airport agreement	Journal of Air Transport Management	45	1
347	Gillen and Morrison (2003)	Bundling, integration and the delivered price of air travel: Are low cost carriers full service competitors?	Journal of Air Transport Management	42	1
211	Fu, Oum, and Zhang (2010)	Air transport liberalization and its impacts on airline competition and air passenger traffic	Transportation Journal	39	2
315	Warnock-Smith and Potter (2005)	An exploratory study into airport choice factors for European low-cost airlines	Journal of Air Transport Management	39	1
250	Ishii, Jun, and Van Dender (2009)	Air travel choices in multi-airport markets	Journal of Urban Economics	38	2
320	Morrell (2005)	Airlines within airlines: An analysis of US network airline responses to Low Cost Carriers	Journal of Air Transport Management	37	1
247	Pels, Njegovan, and Behrens (2009)	Low-cost airlines and airport competition	Transportation Research Part E	36	2
223	Bel and Fageda (2009)	Privatization, regulation and airport pricing: An empirical analysis for Europe	Journal of Regulatory Economics	35	3
267	Hofer, Windle, and Dresner (2008)	Price premiums and low cost carrier competition	Transportation Research Part E	35	2
330	Mason (2005)	Observations of fundamental changes in the demand for aviation services	Journal of Air Transport Management	35	2
198	Kim and Lee (2011)	Customer satisfaction using low cost carriers	Tourism Management	33	4
316	Rose, Hensher, and Greene (2005)	Recovering costs through price and service differentiation: Accounting for exogenous information on attribute processing strategies in airline choice	Journal of Air Transport Management	32	1
350	Vowles (2000)	The effect of low fare air carriers on airfares in the US	Journal of Transport Geography	32	1
319	Alderighi, Cento, Nijkamp, and Rietveld (2005)	Network competition - The coexistence of hub-and-spoke and point-to-point systems	Journal of Air Transport Management	31	1
240	Malighetti, Paleari, and Redondi (2009)	Pricing strategies of low-cost airlines: The Ryanair case study	Journal of Air Transport Management	30	3
339	Pels and Rietveld (2004)	Airline pricing behaviour in the London-Paris market	Journal of Air Transport Management	30	3
164	Fu, Zhang, and Lei (2012)	Will China's airline industry survive the entry of high-speed rail?	Research in Transportation Economics	29	2
325	Evangelho, Huse, and Linhares (2005)	Market entry of a low cost airline and impacts on the Brazilian business travelers	Journal of Air Transport Management	27	4
345	Forsyth (2003)	Low-cost carriers in Australia: Experiences and impacts	Journal of Air Transport Management	27	3
231	Mantin and Koo (2009)	Dynamic price dispersion in airline markets	Transportation Research Part E	27	3
281	Dennis (2007)	End of the free lunch? The responses of traditional European airlines to the low-cost carrier threat	Journal of Air Transport Management	26	1
236	Balcombe, Fraser, and Harris (2009)	Consumer willingness to pay for in-flight service and comfort levels: A choice experiment	Journal of Air Transport Management	25	–

(continued on next page)

Table 1 (*continued*)

ID	Authors, year	Title	Source Title	# citations	Factor
291	Franke (2007)	Innovation: The winning formula to regain profitability in aviation?	Journal of Air Transport Management	25	1
62	Escobar-Rodríguez and Carvajal-Trujillo (2014)	Online purchasing tickets for low cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model	Tourism Management	24	4
293	Forsyth (2007)	The impacts of emerging aviation trends on airport infrastructure	Journal of Air Transport Management	24	1
299	Fu, Lijesen, and Oum (2006))	An analysis of airport pricing and regulation in the presence of competition between full service airlines and low cost carriers	Journal of Transport Economics and Policy	24	2
253	Zhang, Hanaoka, Inamura, and Ishikura (2008)	Low-cost carriers in Asia: Deregulation, regional liberalization and secondary airports	Research in Transportation Economics	24	2
124	Brueckner, Lee, and Singer (2013)	Airline competition and domestic US airfares: A comprehensive reappraisal	Economics of Transportation	23	2
218	Davison and Ryley (2010)	Tourism destination preferences of low-cost airline users in the East Midlands	Journal of Transport Geography	23	5
219	Donzelli (2010)	The effect of low-cost air transportation on the local economy evidence from Southern Italy	Journal of Air Transport Management	23	5
122	Dobruszkes (2013)	The geography of European low-cost airline networks: A contemporary analysis	Journal of Transport Geography	22	1
226	Barbot (2009)	Airport and airlines competition: Incentives for vertical collusion	Transportation Research Part B	21	–
145	Grigolon, Kemperman, and Timmermans (2012)	The influence of low-fare airlines on vacation choices of students: Results of a stated portfolio choice experiment	Tourism Management	21	1
266	Koenigsberg, Muller, and Vilcassim (2008)	EasyJet® pricing strategy: Should low-fare airlines offer last-minute deals?	Quantitative Marketing and Economics	20	3
272	Oliveira (2008)	An empirical model of low-cost carrier entry	Transportation Research Part A	20	2
237	Papatheodorou and Arvanitis (2009)	Spatial evolution of airport traffic and air transport liberalisation: the case of Greece	Journal of Transport Geography	20	1
147	Alderighi, Cento, Nijkamp, and Rietveld (2012)	Competition in the European aviation market: the entry of low-cost airlines	Journal of Transport Geography	19	2
355	Barrett (1999)	Peripheral market entry, product differentiation, supplier rents and sustainability in the deregulated European aviation market - a case study	Journal of Air Transport Management	19	1
156	de Wit and Zuidberg (2012)	The growth limits of the low cost carrier model	Journal of Air Transport Management	19	1
171	Lu, Wang, Hung, and Lu (2012)	The effects of corporate governance on airline performance: Production and marketing efficiency perspectives	Transportation Research Part E	19	6
214	Casey (2010)	Low cost air travel: Welcome aboard?	Tourist Studies	18	1
329	Pitfield (2005a)	A time series analysis of the pricing behaviour of directly competitive 'low-cost' airlines	International Journal of Transport Economics	17	3
306	Fourie and Lubbe (2006)	Determinants of selection of full-service airlines and low-cost carriers - A note on business travellers in South Africa	Journal of Air Transport Management	16	4
314	Lawton and Solomko (2005)	When being the lowest cost is not enough: Building a successful low-fare airline business model in Asia	Journal of Air Transport Management	16	3
242	Lu (2009)	The implications of environmental costs on air passenger demand for different airline business models	Journal of Air Transport Management	16	–
220	Malighetti, Paleari, and Redondi (2010)	Has Ryanair's pricing strategy changed over time? An empirical analysis of its 2006–2007 flights	Tourism Management	16	3
182	Chung and Whang (2011)	The impact of low cost carriers on Korean Island tourism	Journal of Transport Geography	15	5
309	Greer (2006)	Are the discount airlines actually more efficient than the legacy carriers?: A data envelopment analysis	International Journal of Transport Economics	15	–
302	Fan (2006)	Improvements in intra-European inter-city flight connectivity: 1996–2004	Journal of Transport Geography	14	1
126	Chang and Hung (2013)	Adoption and loyalty toward low cost carriers: The case of Taipei-Singapore passengers	Transportation Research Part E	13	4
254	Fageda and Fernández-Villadangos (2009)	Triggering competition in the Spanish airline market: The role of airport capacity and low-cost carriers	Journal of Air Transport Management	13	2
189	Fageda, Jiménez, and Perdiguero (2011)	Price rivalry in airline markets: a study of a successful strategy of a network carrier against a low-cost carrier	Journal of Transport Geography	13	1
317	Pitfield (2005b)	Some speculations and empirical evidence on the oligopolistic behaviour of competing low-cost airlines	Journal of Transport Economics and Policy	13	2
274	Ryley and Davison (2008)	UK air travel preferences: Evidence from an East Midlands household survey	Journal of Air Transport Management	13	5
181	Bachis and Piga (2011)	Low-cost airlines and online price dispersion	International Journal of Industrial Organization	12	3
326	Flouris and Walker (2005)	The financial performance of low-cost and full-service airlines in times of crisis	Canadian Journal of Administrative Sciences	12	1
114	Han (2013)	Effects of in-flight ambience and space/function on air travelers' decision to select a low-cost airline	Tourism Management	12	4
318	Klophaus (2005)	Frequent flyer programs for European low-cost airlines: Prospects, risks and implementation guidelines	Journal of Air Transport Management	12	4
248	Oliveira and Huse (2009)	Localized competitive advantage and price reactions to entry: Full-service vs. low-cost airlines in recently liberalized emerging markets	Transportation Research Part E	12	2
115	Duval (2013)	Critical Issues in Air Transport and Tourism	Tourism Geographies	11	5

Table 1 (*continued*)

ID	Authors, year	Title	Source Title	# citations	Factor
344	Fuellhart (2003)	Inter-metropolitan airport substitution by consumers in an asymmetrical airfare environment: Harrisburg, Philadelphia and Baltimore	Journal of Transport Geography	11	–
337	Gorin and Belobaba (2004)	Impacts of entry in airline markets: Effects of revenue management on traditional measures of airline performance	Journal of Air Transport Management	11	5
188	Mikulić and Prebežac (2011)	What drives passenger loyalty to traditional and low-cost airlines? A formative partial least squares approach	Journal of Air Transport Management	11	4
273	Pitfield (2008)	The Southwest effect: A time-series analysis on passengers carried by selected routes and a market share comparison	Journal of Air Transport Management	11	2
162	Yang, Hsieh, Li, and Yang (2012)	Assessing how service quality, airline image and customer value affect the intentions of passengers regarding low cost carriers	Journal of Air Transport Management	11	4
193	Borenstein (2011)	Why can't US airlines make money?	American Economic Review	10	1
251	Morrell (2009)	Can long-haul low-cost airlines be successful?	Research in Transportation Economics	10	1
41	Akamavi, Mohamed, Pellmann, and Xu (2015)	Key determinants of passenger loyalty in the low-cost airline business	Tourism Management	9	4
298	Blackstone, Buck, and Hakim (2006)	Determinants of airport choice in a multi-airport region	Atlantic Economic Journal	9	–
82	Budd, Francis, Humphreys, and Ison (2014)	Grounded: Characterising the market exit of European low cost airlines	Journal of Air Transport Management	9	6
289	Button, Costa, and Cruz (2007)	Ability to recover full costs through price discrimination in deregulated scheduled air transport markets	Transport Reviews	9	1
241	Graham (2009)	Different models in different spaces or liberalized optimizations? Competitive strategies among low-cost carriers	Journal of Transport Geography	9	1
201	Hazledine (2011)	Legacy carriers fight back: Pricing and product differentiation in modern airline marketing	Journal of Air Transport Management	9	2
180	Homsombat, Lei, and Fu (2011)	Development status and prospects for aviation hubs - A comparative study of the major airports in South-east Asia	Singapore Economic Review	9	2
292	Pitfield (2007)	Ryanair's impact on airline market share from the London area airports: A time series analysis	Journal of Transport Economics and Policy	9	2
238	Alves and Barbot (2009)	Price discrimination strategies of low-cost carriers	Journal of Transport Economics and Policy	8	3
123	Dobson and Piga (2013)	The impact of mergers on fares structure: Evidence from European low-cost airlines	Economic Inquiry	8	3
63	Ferrer-Rosell, Martínez-Garcia, and Coenders (2014)	Package and no-frills air carriers as moderators of length of stay	Tourism Management	8	4
224	Hazledine (2010)	Pricing, competition and policy in Australasian air travel markets	Journal of Transport Economics and Policy	8	–
353	Lawton (1999)	The limits of price leadership: Needs-based positioning strategy and the long-term competitiveness of Europe's low fare airlines	Long Range Planning	8	–
305	Mason (2006)	The value and usage of ticket flexibility for short haul business travellers	Journal of Air Transport Management	8	1
94	Pearson and Merkert (2014)	Airlines-within-airlines: A business model moving East	Journal of Air Transport Management	8	6
249	Pels (2009))	Network competition in the open aviation area	Journal of Air Transport Management	8	2
322	Rubin and Joy (2005)	Where are the airlines headed? Implications of airline industry structure and change for consumers	Journal of Consumer Affairs	8	1
310	Vowles (2006)	Airfare pricing determinants in hub-to-hub markets	Journal of Transport Geography	8	2
93	Zhang, Yang, Wang, and Zhang (2014)	Market power and its determinants in the Chinese airline industry	Transportation Research Part A	8	2
195	Fu, Dresner, and Oum (2011)	Effects of transport service differentiation in the US domestic airline market	Transportation Research Part E	7	2
271	Gorin and Belobaba (2008)	Assessing predation in airline markets with low-fare competition	Transportation Research Part A	7	3
163	Lin (2012)	Airlines-within-airlines strategies and existence of low-cost carriers	Transportation Research Part E	7	2
202	Murakami (2011a)	Empirical analysis of inter-firm rivalry between Japanese full-service and low-cost carriers	Pacific Economic Review	7	2
167	Salanti, Malighetti, and Redondi (2012)	Low-cost pricing strategies in leisure markets	Tourism Management	7	3
268	Barbot (2008)	Can low cost carriers deter or accommodate entry?	Transportation Research Part E	6	4
149	Castillo-Manzano, López-Valpuesta, and Pedregal (2012)	What role will hubs play in the LCC point-to-point connections era? The Spanish experience	Journal of Transport Geography	6	1
185	Coles, Fenclova, and Dinan (2011)	Responsibilities, recession and the tourism sector: Perspectives on CSR among low-fares airlines during the economic downturn in the UK	Current Issues in Tourism	6	1
68	Homsombat, Lei, and Fu (2014)	Competitive effects of the airlines-within-airlines strategy - Pricing and route entry patterns	Transportation Research Part E	6	2
67	Low and Lee (2014)	Effects of internal resources on airline competitiveness	Journal of Air Transport Management	6	6
196	Murakami (2011b)	Time effect of low-cost carrier entry and social welfare in US large air markets	Transportation Research Part E	6	2
166	Rosselló and Riera (2012)	Pricing European package tours: The impact of new distribution channels and low--cost airlines	Tourism Economics	6	5

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Table 1 (*continued*)

ID	Authors, year	Title	Source Title	# citations	Factor
90	Arjomandi and Seufert (2014)	An evaluation of the world's major airlines' technical and environmental performance	Economic Modelling	5	6
359	Barrett (1992)	Barriers to contestability in the deregulated European aviation market	Transportation Research Part A	5	–
169	Button (2012)	Low-cost airlines: A failed business model?	Transportation Journal	5	3
37	Fageda, Suau-Sanchez, and Mason (2015)	The evolving low-cost business model: Network implications of fare bundling and connecting flights in Europe	Journal of Air Transport Management	5	3
260	Hazledine (2008)	Competition and competition policy in the trans-Tasman air travel market	Australian Economic Review	5	–
335	Kua and Baum (2004)	Perspectives on the development of low-cost airlines in South-east Asia	Current Issues in Tourism	5	1
146	Müller, Hüschelrath, and Bilotkach (2012)	The Construction of a Low-Cost Airline Network - Facing Competition and Exploring New Markets	Managerial and Decision Economics	5	1
53	Prince and Simon (2015)	Do incumbents improve service quality in response to entry? Evidence from airlines' on-time performance	Management Science	5	2
69	Wittman (2014)	Are low-cost carrier passengers less likely to complain about service quality?	Journal of Air Transport Management	5	4
209	Albers, Heuermann, and Koch (2010)	Internationalization strategies of EU and Asia-Pacific low fare airlines	Journal of Air Transport Management	4	1
288	Alves and Barbot (2007)	Do low cost carriers have different corporate governance models?	Journal of Air Transport Management	4	1
312	Anderson, Gong, and Lakshmanan (2005)	Competition in a Deregulated Market for Air Travel: The U.S. Domestic Experience and Lessons for Global Markets	Research in Transportation Economics	4	1
170	Daft and Albers (2012)	A profitability analysis of low-cost long-haul flight operations	Journal of Air Transport Management	4	1
174	Detzen, Jain, Likitapiwat, and Rubin (2012)	The impact of low cost airline entry on competition, network expansion, and stock valuations	Journal of Air Transport Management	4	1
208	Legeza, Selymes, and Torok (2010)	Investigation of European air transport traffic by utility-based decision model	Aviation	4	1
161	Martínez-Garcia, Ferrer-Rosell, and Coenders (2012)	Profile of business and leisure travelers on low cost carriers in Europe	Journal of Air Transport Management	4	4
252	Pitfield (2009)	Some insights into competition between low-cost airlines	Research in Transportation Economics	4	3
221	Pulina and Cortés-Jiménez (2010)	Have low-cost carriers influenced tourism demand and supply? The case of Alghero, Italy	Tourism Analysis	4	5
277	Sauter-Servaes and Nash (2007)	Applying low-cost airline pricing strategies to European railroads	Transportation Research Record	4	1
138	Whyte, Prideaux, and Sakata (2012)	The evolution of Virgin Australia from a low-cost carrier to a full-service airline - Implications for the tourism industry	Advances in Hospitality and Leisure	4	5
151	Aydemir (2012)	Threat of market entry and low cost carrier competition	Journal of Air Transport Management	3	4
35	Bilotkach, Gaggero, and Piga (2015)	Airline pricing under different market conditions: Evidence from European Low-Cost Carriers	Tourism Management	3	4
190	Danaher, Roberts, Roberts, and Simpson (2011)	Applying a dynamic model of consumer choice to guide brand development at Jetstar airways	Marketing Science	3	6
89	Hanaoka, Takebayashi, Ishikura, and Saraswati (2014)	Low-cost carriers versus full service carriers in ASEAN: The impact of liberalization policy on competition	Journal of Air Transport Management	3	6
246	Liu (2009)	Entry behaviour and financial distress: An empirical analysis of the US domestic airline industry	Journal of Transport Economics and Policy	3	2
65	Melo Filho, Salgado, Sato, and Oliveira (2014)	Modeling the effects of wage premiums on airline competition under asymmetric economies of density: A case study from Brazil	Journal of Air Transport Management	3	–
200	Ramón-Rodríguez, Moreno-Izquierdo, and Perles-Ribes (2011)	Growth and internationalisation strategies in the airline industry	Journal of Air Transport Management	3	3
100	Wittmer and Rowley (2014)	Customer value of purchasable supplementary services: The case of a European full network carrier's economy class	Journal of Air Transport Management	3	1
113	Zhang, Derudder, and Witlox (2013)	The impact of hub hierarchy and market competition on airfare pricing in US hub-to-hub markets	Journal of Air Transport Management	3	2
282	(Domanico, 2007)	The European airline industry: Law and economics of low cost carriers	European Journal of Law and Economics	2	1
111	Elwakil, Windle, and Dresner (2013)	Transborder demand leakage and the US-Canadian air passenger market	Transportation Research Part E	2	–
66	Hernandez and Wiggins (2014)	Nonlinear pricing strategies and competitive conditions in the airline industry	Economic Inquiry	2	3
108	Malighetti, Stefano, and Redondi (2013)	The Low-cost fare response to new entry	European Transport Research Review	2	3
183	Munusamy, Chelliah, and Pandian (2011)	Customer satisfaction delivery in airline industry in Malaysia: A case of Low Cost Carrier	Australian J. of Basic and Applied Sciences	2	4
28	Pearson et al. (2015)	The strategic capability of Asian network airlines to compete with low-cost carriers	Journal of Air Transport Management	2	4
204	Tretheway (2011)	Comment on “legacy carriers fight back”	Journal of Air Transport Management	2	1
48	Alderighi, Nicolini, and Piga (2015)	Combined effects of capacity and time on fares: Insights from the yield management of a low-cost airline	Review of Economics and Statistics	1	3
205	Belobaba (2011)	Did LCCs save airline revenue management	Journal of Revenue and Pricing Management	1	3
134	Jou, Lin, and Wu (2013)	The impact of income on airfare pricing	Transportmetrica A: Transport Science	1	3

Table 1 (*continued*)

ID	Authors, year	Title	Source Title	# citations	Factor
118	Kawamori and Lin (2013)	Airline mergers with low cost carriers	Economics of Transportation	1	–
91	Malighetti, Redondi, and Salanti (2014)	Competitive vs. monopolistic routes: Are fares so different?	Research in Transportation Economics	1	3
51	Morandi, Malighetti, Paleari, and Redondi (2015)	Codesharing agreements by low-cost carriers: An explorative analysis	Journal of Air Transport Management	1	4
33	Seo, Moon, and Lee (2015)	Synergy of corporate social responsibility and service quality for airlines: The moderating role of carrier type	Journal of Air Transport Management	1	4

structure and multiple equilibria in airline markets" by Ciliberto and Tamer (2009). The average number of citations per year reveals that researches published in Transportation Journal, Transportation Research Part A: Policy and Practice and Transportation Research Part B: Methodological have the higher impact. The older paper is "The impact of low-cost carriers on airport and route competition" by Dresner, Lin, and Windle (1996) published in Journal of Transport Economics and Policy while the second is "Competitive responses to low cost carrier entry" by two of the first three authors (Windle & Dresner, 1999) published in Transportation Research Part E: Logistics and Transportation Review.

3.2. Findings from factor analysis

The Principal Components Analysis (PCA) with varimax rotation is an extraction technique to identify the key factors that describe the sample. In Table 2, a set of six factors, including 143 papers of 156 (core set), explains 72.6% of the variance.

The factor loadings represent the correlation between the paper and the factor, i.e. the degree to which the article belongs to that group. According to prior studies (e.g. Annarelli & Nonino, 2015; Di Stefano et al., 2012; Pilkington & Meredith, 2009), factor loading is significant only if greater than 0.4 while loadings higher than 0.8 indicate high correlation. We identified the papers belonging to each factor, starting from the factor loading(s) of each article (Table 3).

The subjects of the papers belonging to each factor characterize six clusters of research topics. As expected, the factors describe several relevant aspects of LCCs' pricing, offering each one a complementary view of the process by answering the following research questions:

Factor 1. How does LCCs' pricing relate to their business model?
Factor 2. How does LCCs' pricing interact with the market structure?
Factor 3. How does LCCs' pricing change over time and routes?
Factor 4. How does LCCs' pricing address customers' perceived quality?
Factor 5. How does LCCs' pricing influence leisure passengers and tourism?
Factor 6. How does LCCs' pricing affect different dimensions of efficiency?

Table 4 shows, for each factor, the total and the average number of citations per paper, along with the average seniority of the papers. First two factors have the highest research impact, in terms of number of papers and average number of citations per paper. Factor 4 and Factor 6, with a lower average seniority, have a very high research impact according to the average number of citations per year.

Table 2
Results of the principal components analysis.

Factor	Value	Percent	Cumulate %	Ratio
1	40.22350	26.0	26.0	1.541
2	26.10932	16.8	42.8	1.254
3	20.82207	13.4	56.2	1.780
4	11.69749	7.5	63.8	1.451
5	8.05978	5.2	69.0	1.418
6	5.68195	3.7	72.6	1.177

3.2.1. Factor 1: LCCs' business model

Factor 1 discusses and analyzes the characteristics of LCCs' business models, considering the effect of liberalization, organization process, airport choice and modifications to passengers' perception. Most contributions present how these choices interact with the Full Service Carriers (FSCs). The main result addresses a general need to reinvent the traditional FSC's business model in response to LCCs' evolution, showing opportunities and limitations, mainly related to route density, for both the players.

Undoubtedly, the history of Ryanair (Barrett, 1999) proves an initial sustainability of the low fare product in respect of passenger preference, labor markets and external costs such as airports and reservations, given the regulatory environment. LCCs play a statistically significant role in airfare determination and airline organization in the US, as well as hub domination, market share and type of destinations (Vowles, 2000). Their behavior is mainly customer-driven, as the adaptation to their different requirements plays a main role in adjusting their business model to, for example, business travelers (Mason, 2001), leisure travelers, (Casey, 2010) and students (Grigolon et al., 2012). Borenstein (2011) confirms how the cost differential between FSCs and LCCs is one of the major determinant of the demand downturn, which has persisted even as the price differential greatly declined. Successful case studies of Southwest, Ryanair and EasyJet show several characteristics, (e.g.) operational efficiency, point-to-point service, simplicity of service and thus of processes and organization (Gillen & Lall, 2004), which proved to be more robust even after September 11 (9/11) in the analysis of Flouris and Walker (2005) on Southwest.

Tretheway (2004) argued that what really differentiate a LCC from a FSC is the business model. The study pinpoints the inherent flaws emerged in the business model of the FSCs, showing the benefits of the LCCs' ones, then discussing potential future scenarios. The entry of low cost airlines has thrown out a challenge to all airlines to find ways of attracting passengers, through a mix of fare discounting, greater frequency, improved flight times and no-frill's levels of on-board service (Rose et al., 2005). These strategies have an impact on cost recovery as airlines seek business in an increasingly heterogeneous passenger market, while the understanding what really matters to potential passengers grows in importance. Alderighi et al. (2005) identify conditions under which asymmetric equilibria may exist when carriers compete. The study defines for the network configuration of carriers' business model, two stable outcomes: the point-to-point strategy, adopted by the LCC, and the hub-and-spoke, generally adopted by the FSCs, confirming the potential coexistence of the two alternative business models. Dennis (2007) analyses the increasing pressure to two FSCs, i.e. British Airways and Lufthansa, due to the growth of LCCs. These competition implied several changes in the FSCs' business model, aiming to acquire similar aspects of the LCCs (e.g. changes to the on-board service, direct-sell, lower prices). As a further example, Mason (2006) checks the impact on FSCs, in terms of revenue management, of the pay-for-usage approach to ticket flexibility of LCCs that undermines the

Table 3
Factors loading*.

Id	Papers	Year	Factors					
			1	2	3	4	5	6
281	Dennis, N.	2007	0,9692					
241	Graham, M.	2009	0,9573					
319	Alderighi, M., Cento, A., Nijkamp, P., Rietveld, P.	2005	0,9416					
304	Francis, G., Humphreys, I., Ison, S., Aicken, M.	2006	0,9413					
300	Dobruszkes, F.	2006	0,9311					
208	Legeza, E., Selymes, P., Torok, A.	2010	0,933					
189	Fageda, X., Jiménez, J.L., Perdiguero, J.	2011	0,9276					
185	Coles, T., Fenclova, E., Dinan, C.	2011	0,9166					
342	Franke, M.	2004	0,9122					
204	Tretheway, M.	2011	0,8933					
122	Dobruszkes, F.	2013	0,8824					
316	Rose, J.M., Hensher, D.A., Greene, W.H.	2005	0,886					
335	Kua, J., Baum, T.	2004	0,8798					
320	Morrell P.	2005	0,8757					
351	Mason, K.J.	2000	0,8629					
315	Warnock-Smith, D., Potter, A.	2005	0,8572					
336	Francis, G., Humphreys, I., Ison, S.	2004	0,8481					
277	Sauter-Servaes, T., Nash, A.	2007	0,8383					
251	Morrell, P.	2009	0,8369					
289	Button, K., Costa, A., Cruz, C.	2007	0,8329					
346	Francis, G., Fidato, A., Humphreys, I.	2003	0,836					
349	Mason, K.J.	2001	0,8216					
341	Gillen, D., Lall, A.	2004	0,8157					
291	Franke, M.	2007	0,7989					
347	Gillen, D., Morrison, W.	2003	0,7936	−0,417				
156	de Wit, J.G., Zuidberg, J.	2012	0,794					
100	Wittmer, A., Rowley, E.	2014	0,7859					
322	Rubin, R.M., Joy, J.N.	2005	0,7818					
326	Flouris, T., Walker, T.J.	2005	0,7671					
288	Alves, C.F., Barbot, C.	2007	0,7592	−0,451				
312	Anderson, W.P., Gong, G., Lakshmanan, T.R.	2005	0,758					
174	Detzen, D., Jain, P.K., Likitapiwat, T., Rubin, R.M.	2012	0,797					
145	Grigolon, A.B., Kemperman, A.D.A.M., Timmermans, H.J.P.	2012	0,783					
146	Müller, K., Hüschelrath, K., Bilotkach, V.	2012	0,7	−0,4861				
293	Forsyth, P.	2007	0,6994					
350	Vowles, T.M.	2000	0,6984	−0,6395				
301	Barbot, C.	2006	0,6974					
340	Tretheway, M.W.	2004	0,6913	−0,4515	0,4531			
355	Barrett, S.D.	1999	0,6518					
214	Casey, M.E.	2010	0,6452					
305	Mason, K.	2006	0,6363					
282	Domanico, F.	2007	0,6341					
302	Fan, T.	2006	0,633					
149	Castillo-Manzano, J.I., López-Valpuesta, L., Pedregal, D.J.	2012	0,5596					
209	Albers, S., Heuermann, C., Koch, B.	2010	0,526					
170	Daft, J., Albers, S.	2012	0,4437					
193	Borenstein, S.	2011	0,4437					
237	Papatheodorou, A., Arvanitis, P.	2009	0,4431					
253	Zhang, A., Hanaoka, S., Inamura, H., Ishikura, T.	2008	0,544	−0,722				
247	Pels, E., Njegovan, N., Behrens, C.	2009	0,5186	−0,574		0,598		
272	Oliveira, A.V.M.	2008		−0,9224				
267	Hofer, C., Windle, R.J., Dresner, M.E.	2008		−0,9144				
196	Murakami, H.	2011		−0,9133				
124	Brueckner, J.K., Lee, D., Singer, E.S.	2013		−0,9125				
202	Murakami, H.	2011		−0,91				
195	Fu, X., Dresner, M., Oum, T.H.	2011		−0,898				
93	Zhang, Q., Yang, H., Wang, Q., Zhang, A.	2014		−0,8971				
354	Windle, R., Dresner, M.	1999		−0,8951				
180	Homsombat, W., Lei, Z., Fu, X.	2011		−0,8846				
248	Oliveira, A.V.M., Huse, C.	2009		−0,882				
249	Pels, E.	2009		−0,8677				
211	Fu, X., Oum, T.H., Zhang, A.	2010		−0,8627				
164	Fu, X., Zhang, A., Lei, Z.	2012		−0,8494				
68	Homsombat, W., Lei, Z., Fu, X.	2014		−0,844				
310	Vowles, T.M.	2006		−0,8154				
273	Pitfield, D.E.	2008		−0,816				
215	Adler, N., Pels, E., Nash, C.	2010		−0,87				
250	Ishii, J., Jun., S., Van Dender, K.	2009		−0,78				
299	Fu, X., Lijesen, M., Oum, T.H.	2006		−0,7677				
358	Dresner, M., Lin, J.-S.C., Windle, R.	1996		−0,7628				
53	Prince, J.T., Simon, D.H.	2015		−0,7628				
246	Liu, C.-M.	2009		−0,7164				
113	Zhang, S., Derudder, B., Witlox, F.	2013		−0,78				
234	Ciliberto, F., Tamer, E.	2009		−0,6973				0,4537

Table 3 (*continued*)

			Factors					
Id	*Papers*	Year	1	2	3	4	5	6
163	Lin, M.H.	2012		−0,6956				
352	Barrett, S.D.	2000		−0,6859				
292	Pitfield, D.E.	2007		−0,6846				
147	Alderighi, M., Cento, A., Nijkamp, P., Rietveld, P.	2012		−0,6148	0,478			
317	Pitfield, D.E.	2005		−0,576	0,4586			
201	Hazledine, T.	2011		−0,5661				
330	Mason, K.J.	2005		−0,5375			0,5697	
254	Fageda, X., Fernández-Villadangos, L.	2009		−0,515				
37	Fageda, X., Suau-Sanchez, P., Mason, K.J.	2015	−0,4155		0,554		0,4554	
223	Bel, G., Fageda, X.	2009		−0,588	0,5178			
271	Gorin, T., Belobaba, P.	2008		−0,4917	0,5573			
345	Forsyth, P.	2003		−0,415	0,547		0,4156	
181	Bachis, E., Piga, C.A.	2011			0,9592			
266	Koenigsberg, O., Muller, E., Vilcassim, N.J.	2008			0,9575			
167	Salanti, A., Malighetti, P., Redondi, R.	2012			0,9562			
134	Jou, R.-C., Lin, C.-C., Wu, K.-F.	2013			0,9466			
252	Pitfield, D.E.	2009			0,9466			
91	Malighetti, P., Redondi, R., Salanti, A.	2014			0,9466			
205	Belobaba, P.P.	2011			0,9466			
220	Malighetti, P., Paleari, S., Redondi, R.	2010			0,9452			
240	Malighetti, P., Paleari, S., Redondi, R.	2009			0,9169			
108	Malighetti, P., Stefano, P., Redondi, R.	2013			0,9155			
339	Pels, E., Rietveld, P.	2004			0,8995			
231	Mantin, B., Koo, B.	2009			0,8794			
329	Pitfield, D.E.	2005			0,8613			
169	Button, K.	2012			0,824			
238	Alves, C.F., Barbot, C.	2009			0,8141			
123	Dobson, P.W., Piga, C.A.	2013			0,846			
48	Alderighi, M., Nicolini, M., Piga, C.A.	2015			0,744			
314	Lawton, T.C., Solomko, S.	2005			0,6273		0,4479	
200	Ramón-Rodríguez, A.B., Moreno-Izquierdo, L., Perles-Ribes, J.F.	2011			0,666			0,4154
66	Hernandez, M.A., Wiggins, S.N.	2014			0,5851			
306	Fourie, C., Lubbe, B.	2006	0,574			0,6745		
325	Evangelho, F., Huse, C., Linhares, A.	2005	0,4356			0,683		
188	Mikulić, J., Prebežac, D.	2011	0,4296			0,8122		
35	Bilotkach, V., Gaggero, A.A., Piga, C.A.	2015			0,411	0,7667		
41	Akamavi, R.K., Mohamed, E., Pellmann, K., Xu, Y.	2015				0,993		
114	Han, H.	2013				0,8896		
62	Escobar-Rodríguez, T., Carvajal-Trujillo, E.	2014				0,8814		
33	Seo, K., Moon, J., Lee, S.	2015				0,8814		
126	Chang, L.-Y., Hung, S.-C.	2013				0,862		
198	Kim, Y.K., Lee, H.R.	2011				0,845		
183	Munusamy, J., Chelliah, S., Pandian, S.	2011				0,771		
151	Aydemir, R.	2012				0,7357		
162	Yang, K.-C., Hsieh, T.-C., Li, H., Yang, C.	2012				0,6787		
51	Morandi, V., Malighetti, P., Paleari, S., Redondi, R.	2015				0,677		
69	Wittman, M.D.	2014				0,677		
28	Pearson, J., O'Connell, J.F., Pitfield, D., Ryley, T.	2015				0,6454		
318	Klophaus, R.	2005				0,5834		
268	Barbot, C.	2008				0,4997		
161	Martínez-Garcia, E., Ferrer-Rosell, B., Coenders, G.	2012				0,4368		
63	Ferrer-Rosell, B., Martínez-Garcia, E., Coenders, G.	2014				0,4368		
218	Davison, L., Ryley, T.	2010	0,439				0,8287	
219	Donzelli, M.	2010					0,927	
166	Rosselló, J., Riera, A.	2012					0,8971	
221	Pulina, M., Cortés-Jiménez, I.	2010					0,8886	
182	Chung, J.Y., Whang, T.	2011					0,7834	
115	Duval, D.T.	2013					0,6641	
138	Whyte, R., Prideaux, B., Sakata, H.	2012					0,5281	
337	Gorin, T., Belobaba, P.	2004					0,44	
274	Ryley, T., Davison, L.	2008					0,448	
82	Budd, L., Francis, G., Humphreys, I., Ison, S.	2014				0,4228		0,5425
67	Low, J.M.W., Lee, B.K.	2014						0,816
89	Hanaoka, S., Takebayashi, M., Ishikura, T., Saraswati, B.	2014						0,799
171	Lu, W.-M., Wang, W.-K., Hung, S.-W., Lu, E.-T.	2012						0,7589
90	Arjomandi, A., Seufert, J.H.	2014						0,7589
190	Danaher, P.J., Roberts, J.H., Roberts, K., Simpson, A.	2011						0,7494
94	Pearson, J., Merkert, R.	2014						0,6989
186	Merkert, R., Hensher, D.A.	2011						0,6284
309	Greer, M.R.	2006						
226	Barbot, C.	2009						
344	Fuellhart, K.	2003						
353	Lawton, T.C.	1999						
118	Kawamori, T., Lin, M.H.	2013						

(*continued on next page*)

Table 3 (*continued*)

Id	Papers	Year	Factors 1	2	3	4	5	6
224	Hazledine, T.	2010						
236	Balcombe, K., Fraser, I., Harris, L.	2009						
65	Melo Filho, C.R., Salgado, L.H., Sato, R., Oliveira, A.V.M.	2014						
111	Elwakil, O.S., Windle, R.J., Dresner, M.E.	2013						
242	Lu, C.	2009						
260	Hazledine, T.	2008						
298	Blackstone, E.A., Buck, A.J., Hakim, S.	2006						
359	Barrett, S.D.	1992						

* Extraction method: principal component analysis with varimax rotation. Variance explained: 72.6%. Reports present only factor loadings higher than 0.4.

traditional airlines' pricing structures, where the provision of fully flexible business class and full economy may lead to overbooking and denied boarding.

Franke (2004) illustrates how FSCs have to reinvent their own business model, in order to reduce costs and compete with LCCs by reaching efficiency and stabilizing their industrial position in an unstable market. The same Franke (2007) suggests that aside from basic cost cutting, only research into forecasting and optimization models, as well as innovation, customer segmentation and technology, may become the decisive drivers to improve competitiveness. Fageda et al. (2011) argue that FSCs have two alternative strategies: establish a low-cost subsidiary or try to reduce costs using the main brand. The research highlights the successful adoption of the first strategy by Iberia in the Spanish domestic market, who focuses on less dense and shorter routes. The same strategy results bankruptcy for the US carriers, who tried to establish an offshoot LCC. The reason behind these fails seems to be the mixed fleets, the attempt to keeping interlining and two class cabins and the lack of progress on reducing labor costs (Morrell, 2005).

Francis et al. (2006) analyze the international development of LCCs, examining and seeking to characterize the economic and political factors that have encouraged or inhibited their spread. A key factor is the market liberalization, as also argued by Dobruszkes (2006) in his analysis of the European LCCs' business models and networks and by Papatheodorou and Arvanitis (2009) presenting the competitive environment of Greece. This theme strictly relates with airport choice, which represents a key to company's success, as proved by Barbot (2006) in the analysis of the effect of subsidies applied at the Ryanair-Charleroi Airport agreement. Gillen and Morrison (2003) model the conditions under which LCCs affiliated with subsidiary airports only constitute partial completion for FSCs, highlighting the positive effects of traffic's growth for airports. Francis et al. (2003) and Francis et al. (2004) explore the way in which European airports have responded to the apparent opportunities afforded by the growth of LCCs. After having negotiated contracts, which significantly reduce aeronautical charges, the airports consequently seek to make up this short fall by commercial revenues from the increase of passenger numbers. Warnock-Smith and Potter (2005) prove this importance through an exploratory survey of eight European LCCs, showing also some managerial implications. These airports experience a wide increase in demand and thus they have to cope with allocation problem and regulatory environment (Forsyth, 2007). In this context, Button et al. (2007) describe the effects on Lisbon and Porto airports after the entry of LCCs. The study highlights the new competitive environment, where the regulatory reforms of domestic airline markets and the increased number of "Open Skies" agreements have significantly changed the administrative structure.

However, de Wit and Zuidberg (2012) show that besides the continuous rapid growth of LCCs, some signs of LCCs' market limitations arise in Europe and North America, mainly due to the increasing route density. These outcomes motivate LCCs to modify their business model progressively, in order to ensure future growth, by shifting to primary airports, facilitating transfers, engaging code-sharing, entering alliances and acquiring other airlines. Dobruszkes (2013) investigates how the European LCC's spatial strategy has evolved since the last available comprehensive analysis in 2004, demonstrating that there is no a single European low cost mode. Although their business has expanded to Central-East Europe, Morocco, and a few remote areas, it remains mainly focused on the intra-Western market, serving mainly large cities and tourist destinations. Average distance has increased but most flights are short-haul, with an important role in launching new routes and in increasing frontal competition with traditional airlines on pre-existing routes. Morrell (2009) and Daft and Albers (2012) verifies the profitability of extending the LCC's model to long haul operations, according to the different behavior of FSCs, showing how the cost advantages reduce dramatically. Lastly, it is important to observe that in current liberalized market conditions and dense routes, Graham (2009), after having analyzed six different LCCs in Asia, Europe and North America, proposes to move away from the idea of a single business model, highlighting the need to evaluate a wide range of business strategy to ensure the company's success.

3.2.2. Factor 2: LCCs' interaction with the market

Factor 2 describes the evolution of the transportation industry due to the competitive environment that LCCs generate. Most papers describe the effects on airline companies through specific case studies while other contributions highlight the relevance of public policy and regulations in terms of passengers' carrier choice.

Table 4
Size, citation impact and seniority of the factors.

Factor	Name	# of papers	# of citation	# of citation/paper	Average seniority of papers (years)	Average citations/year	Older paper	Most recent paper
1	Business model	48	1239	25,81	8,92	2,75	1999	2014
2	Market	34	863	25,38	7,18	3,63	1996	2015
3	Spatial and timing distribution	24	285	11,88	5,88	1,94	2003	2015
4	Customer behavior	20	203	10,15	4,20	3,12	2005	2015
5	Tourism	9	110	12,22	6,00	2,23	2004	2013
6	Efficiency	8	106	13,25	3,00	3,93	2011	2014
Other factors		13	129	9,92	9,00	1,33	1992	2014
Total		156	2935	18,81	7,00	2,78		

Dresner et al. (1996) develop the first research in this field, investigating the effects in terms of lowered prices and increased passengers' count due to the entry of a LCC onto a route. Same conclusions arise from the analysis of the effects on Delta airfares of ValueJet's entry onto route flowing through Delta's Atlanta hub (Windle & Dresner, 1999). After the North American and European experience, Forsyth (2003) identifies the impacts of LCCs on fares, costs and profitability in the Australian market. This study analyzes the competition between Virgin Blue and Qantas, highlighting the significant improvements in productivity and overall efficiency of the Australian domestic market. Pitfield (2005b) reviews the theory of cost recovery and oligopoly with a view to advancing some judgements as to the way in which European low-cost airlines manage yield, depending upon the market morphology that applies. Pitfield (2007) evaluates how Ryanair's operations affect the UK market, claiming that Ryanair appears to continuously increase its market share and, subsequently, comparing the UK market to the US market by time series analysis (Pitfield, 2008). This study defines a totally altered picture from the one typical of 2000, implying limited effects on competition for merger policy. Zhang, Hanaoka, Inamura, and Ishikura (2008) evaluate the features of Asian LCCs and their development, forecasting a wide potential development, even if the aviation regime across Asian countries is much more restrictive than in the EU and North America. Oliveira (2008) models the price effects in the Brazilian market due to the activity of Gol Airlines, indicating by empirical data the relevance of market size and rival's route presence as underlying determinants of profitability (Oliveira & Huse, 2009). Fageda and Fernández-Villadangos (2009) investigate the influence of LCCs' pricing on the airline competition in Spain, concluding that airlines conduct is more competitive only in routes departing from non-hub airports and low-density routes. Hazledine (2011) investigate competition between the LCCs and FSCs in the New Zealand and Tasman routes, confirming a subsequent decreasing on airfares, according to data of 1001 flights on 19 routes in 2004 and 2005. (Murakami, 2011b) empirically analyzes the airfare level at which most LCCs entered the market, evaluating how other LCCs and FSCs affect the LCCs' entry. Alderighi et al. (2012) investigate the price setting behavior of FSCs, developing a model of airline competition suitable for different market structures, including also LCCs. The model, applied to data of Lufthansa, British Airways, Alitalia and KLM, proves that the existence of a LCC always reduces the FSC's airfares for the leisure and the business segment. On the same path, Brueckner, Lee, and Singer (2013) confirm the effects in the US flights airfares and airports, both in nonstop and connecting markets.

Lin (2012) investigates the airlines-within-airline (AinA) strategy, where a FSC establish low-cost divisions in order to enhance its competitiveness. The study offers some managerial implications claiming that AinA is optimal in case passengers differentiate much between one-stop and nonstop services. Homsombat et al. (2014) report the investigation of the AinA strategy of Qantas airline, who runs a FSC (Qantas Airways) and a low-cost carrier (Jetstar Airways), in order to compete with other LCCs serving the same airspace. The study confirms the benefits to Qantas Group arising from increased market power and quality improvements.

Furthermore, some researchers focus on the competition between High Speed Rails (HSRs) and LCCs, both in the Europe, by the analysis of 27 EU countries, specifically analyzing 4 of the prioritized Trans-European networks (Adler et al., 2010) and in the Chinese context (Fu et al., 2012).

Barrett (2000) is the first to introduce airport competition as a new feature of European aviation under deregulation. Seventeen case studies of airport competition show how newly commercialized and privatized airports are attractive to passengers and low cost airlines to whom they offer large discounts, generating spectacular increases in traffic at lesser-used airports. Vowles (2006) expands the research to the nature of hub-to-hub markets, examining pricing in the United States and the contribution of route and carriers type. Pels et al. (2009) address the issue of the competition between FSC and LCC serving adjacent airports in the Greater London using econometric estimation of demand structure, capturing three key dimensions of passenger choice: airfares, surface-access costs and frequency. Homsombat et al. (2011) benchmark the key performance measures of the hub airport in Southeast Asia, highlighting the development of LCCs as a major driver for traffic growth and suggesting governments to safeguard airline competition by promoting market liberalization and airport capacity investment. Zhang et al. (2014) measure the degree of Chinese airlines' market power by using Lerner index, and then investigate its determinants, recognizing LCCs' primary role. The studies confirm the conceptual framework described by Fu et al. (2010), who examine also the mechanisms leading to liberalization policies and argue the relative positive effects in terms of competition, efficiency, positive externalities to the overall economy and optimization of network within and across continental markets.

To assess the effect of policy and regulation, Fu et al. (2006) develop a duopoly model to analyze and capture the differential competitive effects across FSCs and LCCs. The model suggests government to take into account asymmetric effects when considering the extent of regulation or deregulation. Ciliberto and Tamer (2009) evaluate the effects of a LCC's entry on the profits of its competitors by an econometric model. The study estimates the positive effects of repealing the Wright Amendment in the US air transport markets, with reference to the Dallas airport, by a policy experiment. Fu et al. (2011) investigate empirically the degree of substitutability between the services provided by FSCs and LCCs, confirming their significant differentiation. For this purpose, the study suggest the importance for public policy makers to attempt maintain competition even in a market substantially dominated by LCCs.

Lastly, several articles evaluate the effects on passengers due to competitiveness. Mason (2005) identifies the effect of LCCs' competitiveness on new business travelers' behavior and increased number of leisure travelers, highlighting a general positive effect on dampening the dramatic fall in airlines yields mainly due to terrorist attacks in 2001 and the second Gulf War. Hofer et al. (2008) examine the effects on price premiums, i.e. price markups, due to domination and concentration at the airport and route market levels in the US market. Ishii et al. (2009) surveyed how air passengers trade-off across airport and airline supply characteristics on three San Francisco Bay Area airports. The research addresses a crucial role to several non-price characteristics as airport access time, airport delay, flight frequency, airport-airline combinations, and early arrival time.

3.2.3. Factor 3: LCCs' pricing distribution over time and space

Factor 3 includes 24 papers that focus on the description of the LLCs' pricing strategy evolution over time and routes, by models or data analysis, also in comparison with the FSCs' behavior. These papers attempt to show the reasons of LCCs' growth and find out what are the real dynamics behind prices, regardless the common general perceptions. As for K Button (2012), the sustainability of the low-cost airline business model is still to confirm. Looking at the experiences of a number of markets, the question is whether the model in itself is likely to be enduring, or whether it is simply a transient way for some airlines to recover their full costs.

The first contributions in the field (Pels & Rietveld, 2004; Pitfield, 2005b, 2009) analyzes the pricing behavior of airlines, providing an overview of the characteristics of LCCs as well as their history and geography, to outline ways in which they compete and manage demand. Analysis derives, respectively, from the major cases of London-Paris market (EasyJet, Buzz and Ryanair), the Asia Pacific low-income countries, with a relative lack of viable land transport infrastructure (e.g. Malaysia), Alicante, Prague and Malaga departing from Nottingham East Midlands Airport (EasyJet and Ryanair) and London-Venice (EasyJet and Ryanair) along with Denver-Las Vegas (Southwest and Frontier). Results show how the price dynamics strictly correlates

among different LCCs whose fares reduce at any signal of market saturation (new entrants and other competitors' moves) and increase only at the departure date gets closer. Furthermore, Mantin and Koo (2009) observe on 2500 random US routes the factors that explain the variations of daily airfares across fare histories, concluding that in the presence of LCCs, FSCs tend to adopt a more aggressive Lo-Hi pricing strategy. Hernandez and Wiggins (2014) examine the effect of nonlinear pricing strategies to analyze the impact of concentration and the pressures generated by Southwest and other LCCs on the relative prices within a menu of fares. Similar analysis shows the same actions on airports and route characteristics as for Bel and Fageda (2009) and Fageda et al. (2015).

As for the previous work, Ryanair and EasyJet are currently the main LCCs and their storytelling represents the most common area of investigation. In particular, since Ryanair has currently become the dominant LCC in Europe, softening its dynamic pricing activities on existing routes, it represents a case study for the full life cycle of the strategy. Starting from Malighetti et al. (2009), analyzing the pricing policy adopted by Ryanair to estimate the optimal pricing curve for each route on a year's fare data, many other works, mainly from the same authors, give a picture of the pricing evolutions on different dimension. Malighetti et al. (2010) studies the evolution over time with a panel dataset of fares for all of Ryanair's European flights over a two-year period (2006–2007), calculating the average fare over a 90-day period prior to departure and the intensity of dynamic pricing for each flight. Salanti et al. (2012) use a database of the daily fare over the 3 months prior to each flight operated by EasyJet during 2009, to evaluate discrimination between leisure and business travelers on a single flight or route and across different routes. Dobson and Piga (2013) examine the post-merger behavior after EasyJet and Ryanair acquiring, respectively, Go Fly and Buzz, showing how the takeovers had a net beneficial effect because of the introduction of the acquiring firms' business models and associated yield management pricing systems. Malighetti et al. (2013) study EasyJet's fare response, in the short term, to new entry in the European market during the period 2007–2009. Malighetti et al. (2014) investigate the price policy of Ryanair and EasyJet during 2008, referring to one hundred of the least, and one hundred of the most, dense routes among those operated by the two carriers.

Many authors adopt analytic models to understand customers' behaviors and main factors of success. In particular, Koenigsberg et al. (2008) study the conditions and the consumer characteristics under which offering a last-minute deal is optimal in a single-price policy. Alves and Barbot (2009) check the effectiveness of Lo-Hi strategy while Jou, Lin, and Wu (2013) show possible changes in airline ticket pricing with the passengers' income distribution. Bachis and Piga (2011) present a new form of online pricing tactic where airlines post, at the same time and for the same flight, fares in different currencies that violate the Law of One Price.

3.2.4. Factor 4: Effects of LCCs' pricing on customers' behavior

Factor 4 focus on the difference between perceived and actual LCCs' quality level, mainly by the analysis of surveys on passengers. These papers highlight the strategic importance of balancing service and price to ensure loyalty and passenger satisfaction. There is a general focus on the Eastern world because it is the center of a strong competition between emerging LCCs and existing FSCs.

Klophaus (2005) accurately represents the general theme, recognizing how many market participants re-evaluated their business model by using service features such as frequent flyer programs (FFPs) to offer something more than simply cheap tickets. The author assesses prospects and problems, outlining how European LCCs should design such a programs to increase customer loyalty and long-term profitability. Fourie and Lubbe (2006) investigate similar factors in South Africa, concluding that a successful business model for a LCC, based on price reduction and high flight frequency, has to cope with loyalty programs, in-flight service and airport lounge facilities. Mikulić and Prebežac (2011), in a case study from Lufthansa, Croatia Airlines and Germanwings, analyze the effects of service quality and price on carrier's choice and loyalty, comparing LCCs' and FSCs' approach. Kim and Lee (2011) survey 244 passengers at three major domestic South Korean airports, with a SERVQUAL questionnaire for perceived performance, customer satisfaction, and behavioral intention. Loyalty based on price may be more important than perceived service quality for LCCs' customer satisfaction. Aydemir (2012) looks at the impact of the threat of entry by a LCC, specifically considering price as a competitive factor to ensure the passengers' loyalty. The research compares these effects on FSCs' and LCCs' prices in the US market.

In terms of passenger's choice, Evangelho et al. (2005) are the first to investigate whether there is a significant distinction between the market segment of business travelers using the LCCs and the FSCs, looking at their perception on the key attributes of the services. The study covers the Brazilian market in comparison with other studies in UK. Yang et al. (2012) collect 458 valid responses of a questionnaire with 30 questions based on Likert five-point scales, grouped to give 15 possible service effects, to investigate relationships between service quality, airline image, customer value and behavioral intentions for LCCs' passengers. In particular, they focus on flier's expectations of the services on board. Although the analysis shows the significant positive effect of service quality on customer value and airline image, these latter do not significantly influence behavioral intentions. Chang and Hung (2013) analyze the information on 338 passengers traveling between Taipei and Singapore to identify the main determinants for the passenger adoption of a LCC. The study shows the crucial role of low price and booking channels. Han (2013) gives another perspective, investigating whether in-flight cabin and in-flight attributes influence air travelers' selection. Findings derived from a survey indicate that air quality, temperature, layout and equipment/amenities significantly induce favorable cognitive and affective evaluations and satisfaction, thereby influencing passengers' positive behavioral intentions. Escobar-Rodríguez and Carvajal-Trujillo (2014) examine which are the determinants of purchasing flights from LCCs' websites, using the extended unified theory of acceptance and use of technology (UTAUT) model for measuring the behaviors of 1096 Spanish customers. Key determinants of purchasing are purchase intentions, habit and ease of use, besides other important factors, i.e. effects on trust, cost saving, performance and expended effort, hedonic motivation and social factors. As well, Ferrer-Rosell et al. (2014) analyze the determinants of length of stay among inbound tourists arriving by air in Spain, in relation to whether they travelled by LCC of FSC.

In the last years, many papers focus on the perceived gap of quality when passengers experience a disservice. Wittman (2014), by statistical analysis on US historic data, establishes that passengers of different airlines complain at different rates, even if the airlines have the same level of service quality, thus underlining a significant gap between perceived and actual levels of service quality. Pearson et al. (2015) examine the strategic capability of 22 main Asian FSCs in competing with LCCs, by specific questionnaires to customers across six distinct response categories, i.e. productivity, cost and rationalization, revenue and fare, product, marketing and other strategically integrated responses. The motivation of this study relies on investigating how strategic capability varies by Asian sub-region and by airline performance, considering the differences between perceived performance and actual performance. Akamavi et al. (2015) survey key antecedents' effect on LCC's passenger loyalty at two major British airports within 286 passengers who experienced service failure, indicating that effective service employees not only positively influence service recovery and price but also enhance passenger trust.

3.2.5. Factor 5: Effects of LCCs' pricing on tourism

Factor 5 shows the relation between the environment that emerges from LCCs pricing strategies and the tourism supply or demand in different countries. All these contributions recognize a reciprocal and

symbiotic link between tourism and air transport: great benefits can arise in serving less dense routes with potential touristic attractions, both for LCCs and for the territories.

Ryley and Davison (2008) and Davison and Ryley (2010) present air travel preferences of the public with a household survey in the East Midlands region of the UK. The sample confirms expanding opportunities for regional airports, in particular towards most attractive destinations across Europe. Furthermore, the studies present how the increasing financial pressures will have an impact upon price sensitivity and growth of the market. Donzelli (2010) examines the effects of LCCs' entry in Southern Italy in terms of spreading the traffic demand during the year, increasing the rate of international tourism, generating new jobs in the area, improving thus its income. Chung and Whang (2011) investigate whether or not LCC pricing strategy actually contribute to overall growth in domestic air traffic and on tourism demand for a popular destination in Korea. Similarly, Pulina and Cortés-Jiménez (2010) in-depth analyze the influences of LCCs on dynamics of tourism demand and supply in the town of Alghero (Italy). Rosselló and Riera (2012) investigate the differences in price levels and price dispersion across offline and online markets and across tour operators and new emerging Internet retailers for individual tourist expenditure on travel and accommodation in the Balearic Islands (Spain). Whyte et al. (2012) explore the strategic and operational evolution of Virgin Blue from a LCC to a FSC, as a response to new tourism opportunities. The basic policy consisted of attracting less price sensitive customers, with little interests in loosing customers pursing low-cost holiday options. Finally, Duval (2013) proposes a wide review, with particular reference to the role of LCCs. Its literature focuses on three main issues facing international commercial air transport and the implications for global tourist flows, i.e. the aeropolitical environment, the developments in airline operations and the carbon pricing on aviation.

3.2.6. Factor 6: LCCs' performance efficiency

Factor 6 has a specific focus on the price strategies affecting performance and efficiency of the LCC that may support success. Most papers apply large dataset models of analysis to empirical studies, as for data envelopment analysis (DEA), deriving key determinants of efficiency.

Merkert and Hensher (2011) evaluate the effect on reliving cost pressure of the new environment created by the market entry and penetration of LCCs. Danaher et al. (2011) focus on the Australian market, to trace the entry and the evolution of a LCC pricing strategy. The results show higher prices when they move more passengers, and not-negligible effects on pricing of other means of transport and nearby airports. Lu et al. (2012) evaluate the production efficiency and marketing efficiency where the low-cost airlines, on average, are more efficient carriers than the full-service ones, but less efficient marketers. Hanaoka et al. (2014) apply a quantitative market model to estimate the policy impact of the entry of new LCCs on specific routes, affecting the fare, frequency, and profitability. The study, focusing on the Southeast Asian Nations, shows that a LCC generally prefers high frequency and low-fare flights, modifying its airfares according to the second leading airline's airfares. Arjomandi and Seufert (2014) examine both the environmental and technical efficiencies of airlines, finding that the most technically efficient airlines are from China and North Asia, whilst many of the best environmental performers are from Europe, in particular the low-cost carriers. Pearson and Merkert (2014) study the Asian-Pacific market, determining the necessary pricing strategies for a FSC to establish a successful LCC airline and make it operate onto the same route served by FSC itself. Real data analysis indicates that this strategy has limited success, unless the new company has real autonomy from its parent, market dominance, decisive leadership and less deviation from the pure LCC pricing model. Low and Lee (2014) verify the performance of 114 major international airlines between 1987 and 2010 using the resource-based theory. On the same path, Budd et al. (2014) provide a comprehensive study of 43 market entries and 33 exits of LCCs in Europe between 1992 and 2012. The research highlights as key factors the LCCs' start-up date, the nature and size of its operation and the size and composition of its aircraft fleet.

3.3. Findings from multidimensional scaling

Multi-dimensional scaling (MDS) generates a chart showing the conceptual proximity, or similarity, among the publications. This visual representation of the Pearson's correlation coefficients creates a bi-dimensional map (Fig. 2), where the position of each paper depends on its relationships with the other papers. Articles near the center of the axes have been co-cited more frequently while the distance between two articles defines their degree of similarity in terms of research field. The resulting relative position of factors, as well as an in-depth investigation of the articles at the poles, helps to name the axes and give a meaningful interpretation of the graphical analysis.

Strategy can be defined as a plan designed to achieve a particular long-term aim, while policy is a course or principle of action adopted or proposed by an organization. In the resulting MDS, the x-axis represents on the left the *Evolution of the Internal Context,* which drives pricing strategy formulation, while moving from right to left, the papers shift towards the general description of LCC's pricing policies and how they have an impact on the *Dynamics of the Competitive Environment*. The y-axis represents on the top the *Evolution of the External Context*, while moving from up to down, the papers themes shift from the strategy linkage with the industry to the *Dynamics of the Customers' Demand*.

Following the classic characterization of the three strategic dimensions of content-context-process strategic model, we considered strategy to be the strategy content (the objective/result of strategy activities) and policy to be the strategy process (the plan of strategy activities to reach the desired results) (De Toni & Nonino, 2011). In the graphical representation, papers in the upper-left area focus on pricing strategy (in white in the figure) while papers in the central area - from lower-left to upper-right - focus on pricing policies implemented through pricing practices to successfully achieve a competitive advantage (in blue). In the lower-right area of the map, papers focus on the impact of pricing strategies and policies on competitive environment (in grey).

4. Discussion and conclusions

Considering the relevant number of papers and the increasing interest in the field, the paper aims at explaining the research domains of pricing policy, strategy and practices for LCCs. The application of two multivariate techniques, i.e. factor analysis and multi-dimensional scaling, allows identifying six significant clusters that describe the main streams and address potential future directions of research. The results can be summed up in three main key points.

4.1. Understanding the organizational and price dynamics

Many practical implications derive from policy and strategic choices of LCCs. In details, some results are as expected, (e.g.) the positive correlation between the average fare for each route and its length, the frequency of flights operating on that route and the percentage of fully booked flights. Other results, especially on the most recent analyses when LCCs reach their maturity, show counterintuitive phenomena. For example, many papers confirm that temporal price discrimination tends to decrease, with an average fare reduction subsequent a new entry, especially when the new entrant is a FSC. Business routes have lower average fares per km, while leisure routes show less dynamic prices, with higher minimum and lower maximum fares per km. A low level of demand is sufficient to impose low fares to some extent irrespective of the degree of competition while the reduction of the fares to raise a flight's load factor is unaffected by the intensity of competition in a route. Yield management interventions are less effective the higher the share of leisure traffic on the route.

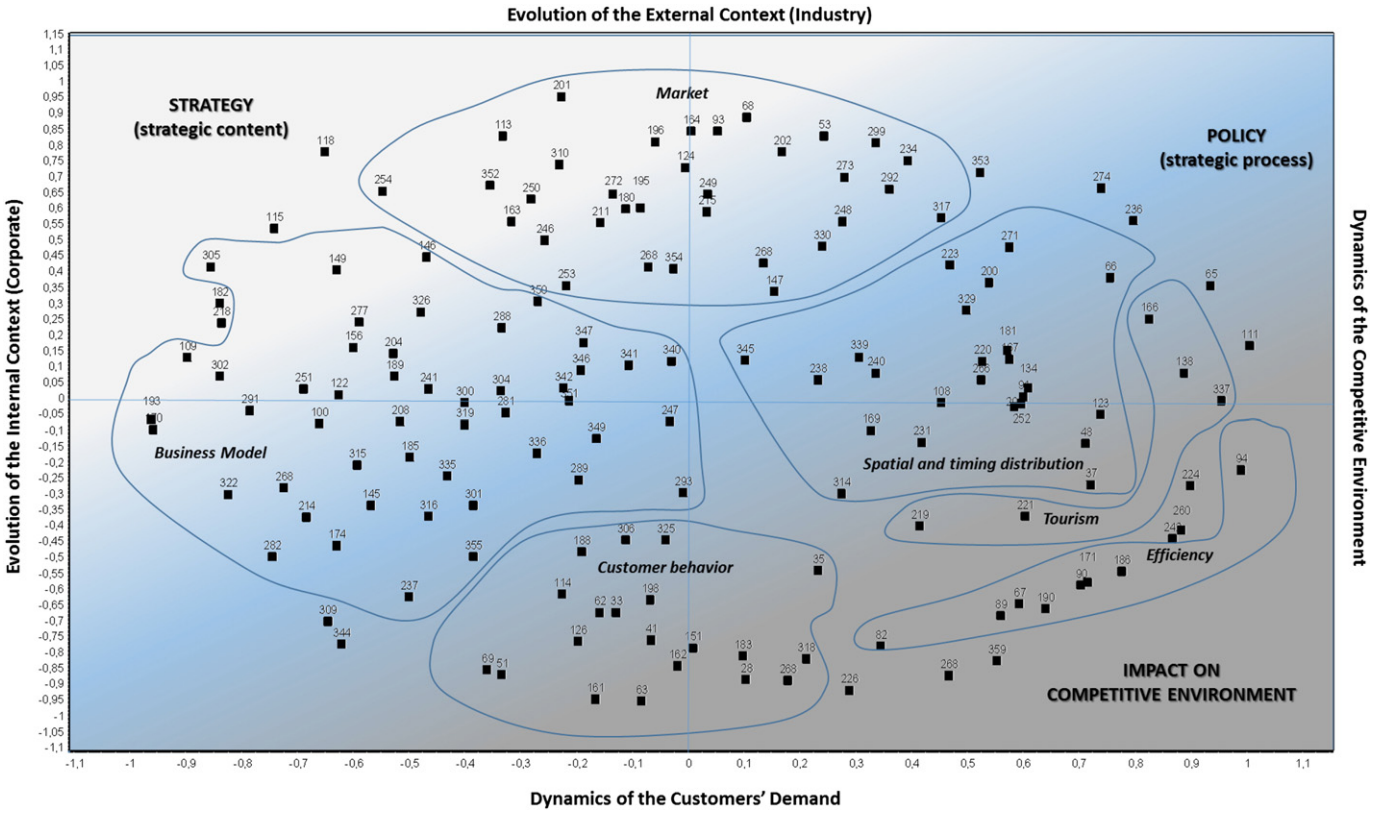

Fig. 2. MDS map.

Passengers' satisfaction plays a main role in changing market dynamics. The outcomes arising from the research suggest going deep into the influence of price on the gap between actual and perceived level of quality. Managers should keep on considering the price as the pivotal leverage to retain passengers, once offered the right service level. This can lead even to show a de-seasonality effect on traffic for some particular routes, due to the lower prices offered by LCCs.

4.2. The role of regulation and market environment

The success of LCCs' pricing strategies strictly depends on regulatory and political aspects, as proved by several case studies. The increase in the number of "Open skies" agreements and the reforms of domestic and regional airline markets allows the spreading of LCCs. Liberalization leads to economic and traffic growth, mainly due the increase in competition and efficiency in the air passengers' transport, and to positive externalities to the overall economy. Deregulated markets, entrepreneurs, population wealth, secondary airports and evolution of technologies, as for internet sales, are the main encouraging economic and social factors. This is particularly true if coupled with the effect on tourism, where LCCs' success can't miss to promote leisure travel, with profitable results both for the carrier itself and for the income of the interested area, in terms of jobs and visitors. This recent research field implies changes in LCC strategy, which has to analyze the potential benefits arising from starting operations on less dense routes. The relevance of these aspects emerges clearly observing the geography of EU transport liberalization, which corresponds to the geography of LCCs diffusion, with similar conclusions arising from the US and Asian market. In particular, airport policy acquires also a crucial role, ensuring the operational effectiveness of the traffic growth (Avenali et al., 2015): a fruitful airport management has to tailor the services to individual airlines, differentiating FSCs from LCCs, rather than treating them uniformly. These conclusions are in line with the researchers in other field that strive to analyze how political and regulatory environment, can affect market competitiveness.

4.3. The evolution of LCCs' business model

The regulation and market environment address strategic decisions of companies, which have to define or modify their business models to cope with current transports' challenges, in terms of competitiveness, volume growth, interlaced networks and enhanced services. Main findings highlight the ability of LCC of a faster decision-making and lean structure. In particular, the analysis reveals some major treats of LCCs' business model, which allow lowering prices: choice of secondary airports as hubs, point-to-point service, operation on less dense routes, uniform fleet, operational efficiency and a limited portfolio of services, as confirmed by several analytic models and successful case studies of Southwest, Ryanair and EasyJet. These common features are now evolving in new specific strategies required to enter and survive in the market, (e.g.) timing and relationship with other carriers, such as alliances and code sharing, even considering the variability of fuel price. In synthesis, LCCs need to review pricing and services to better respond to the changes and the maturity of the industry. On the contrary, FSCs should reinvent their strategies to cope with LCCs, combining a reduction of prices with a targeted offer of services. A modern trend is the AinA strategy, adopted by many FSCs mainly in the Asia-Pacific region, consisting of the airline offshoot as a mean to compete with LCCs. Several applications show how this strategy could lead both to positive and negative effects. This as a specific example that can be extended to the general principle that it is not possible to define a single successful business model for LCCs or FSCs but a wide range of strategy to tailor according to the different operating environment.

In summary, our findings suggest some guidelines for prolific future research directions on LCC pricing:

- Propose modeling which evaluate asymmetric competition on market (due to FSCs and LCCs) to enhance governments' regulations
- Analyze the effects on LCCs' growth (and airport congestion) of current international regulations in terms of security

- Discuss the LCCs' effects in economic development, job creation and enhanced traffic volume for leisure (and not) areas
- Discuss the effects on LCCs' pricing of saturating routes
- Explore the evolution in terms of pricing and business models for future growth of LCCs, even with respect to long distance routes
- Study the impact of market disruptions on leisure and business flights operated by LCCs and propose pricing strategy to avoid or counteract

Appendix A. Sources of papers selected after systematic literature search and of core set of papers

Source	Sample			Core set			
	# of papers	# of citations	Average citations	# of papers	# of citations	Average citations	Average citations/year
Advances in Hospitality and Leisure	1	4	4,00	1	4	4,00	1,00
American Economic Review	1	10	10,00	1	10	10,00	2,00
Atlantic Economic Journal	1	9	9,00	1	9	9,00	0,90
Australian Economic Review	1	5	5,00	1	5	5,00	0,63
Australian Journal of Basic and Applied Sciences	1	2	2,00	1	2	2,00	0,40
Aviation	4	5	1,25	1	4	4,00	0,67
Canadian Journal of Administrative Sciences	1	12	12,00	1	12	12,00	1,09
Current Issues in Tourism	2	11	5,50	2	11	5,50	0,81
Econometrica	1	115	115,00	1	115	115,00	16,43
Economic Inquiry	2	10	5,00	2	10	5,00	1,83
Economic Modelling	1	5	5,00	1	5	5,00	2,50
Economics of Transportation	2	24	12,00	2	24	12,00	4,00
European Journal of Law and Economics	1	2	2,00	1	2	2,00	0,22
European Transport Research Review	1	2	2,00	1	2	2,00	0,67
International Journal of Industrial Organization	1	12	12,00	1	12	12,00	2,40
International Journal of Transport Economics	4	33	8,25	2	32	16,00	1,52
Journal of Air Transport Management	85	1203	14,15	57	1171	20,54	2,50
Journal of Consumer Affairs	1	8	8,00	1	8	8,00	0,73
Journal of Regulatory Economics	1	35	35,00	1	35	35,00	5,83
Journal of Revenue and Pricing Management	3	2	0,67	1	1	1,00	0,20
Journal of Transport Economics and Policy	8	170	21,25	7	167	23,86	1,80
Journal of Transport Geography	20	443	22,15	15	427	28,47	3,56
Journal of Urban Economics	1	38	38,00	1	38	38,00	5,43
Long Range Planning	1	8	8,00	1	8	8,00	0,47
Management Science	1	5	5,00	1	5	5,00	5,00
Managerial and Decision Economics	1	5	5,00	1	5	5,00	1,25
Marketing Science	1	3	3,00	1	3	3,00	0,60
Pacific Economic Review	1	7	7,00	1	7	7,00	1,40
Quantitative Marketing and Economics	1	20	20,00	1	20	20,00	2,50
Research in Transportation Economics	7	73	10,43	6	72	12,00	2,26
Review of Economics and Statistics	3	1	0,33	1	1	1,00	1,00
Singapore Economic Review	2	10	5,00	1	9	9,00	1,80
Tourism Analysis	1	4	4,00	1	4	4,00	0,67
Tourism Economics	5	10	2,00	1	6	6,00	1,50
Tourism Geographies	1	11	11,00	1	11	11,00	3,67
Tourism Management	12	232	19,33	10	202	20,20	5,40
Tourist Studies	1	18	18,00	1	18	18,00	3,00
Transport Reviews	1	9	9,00	1	9	9,00	1,00
Transportation Journal	6	45	7,50	2	44	22,00	3,88
Transportation Research Part A	1	5	5,00	1	5	5,00	0,21
Transportation Research Part A: Policy and Practice	9	96	10,67	4	88	22,00	4,49
Transportation Research Part B: Methodological	3	94	31,33	2	82	41,00	6,58
Transportation Research Part E: Logistics and Transportation Review	19	258	13,58	13	225	17,31	2,76
Transportation Research Record	7	9	1,29	1	4	4,00	0,44
Transportmetrica A: Transport Science	2	1	0,50	1	1	1,00	0,33
Other journal and conferences (non core set of papers)	130	275	2,09	-	-	-	-
Total	360	3359	9,33	156	2935	18,81	2,78

References

Adler, N., Pels, E., & Nash, C. (2010). High-speed rail and air transport competition: Game engineering as tool for cost-benefit analysis. *Transportation Research Part B: Methodological*, *44*(7), 812–833. http://dx.doi.org/10.1016/j.trb.2010.01.001.

Akamavi, R. K., Mohamed, E., Pellmann, K., & Xu, Y. (2015). Key determinants of passenger loyalty in the low-cost airline business. *Tourism Management*, *46*, 528–545. http://dx.doi.org/10.1016/j.tourman.2014.07.010.

Albers, S., Heuermann, C., & Koch, B. (2010). Internationalization strategies of EU and Asia–Pacific low fare airlines. *Journal of Air Transport Management*, *16*(5), 244–250. http://dx.doi.org/10.1016/j.jairtraman.2009.12.001.

Alderighi, M., Cento, A., Nijkamp, P., & Rietveld, P. (2005). Network competition—The coexistence of hub-and-spoke and point-to-point systems. *Journal of Air Transport Management*, *11*(5), 328–334. http://dx.doi.org/10.1016/j.jairtraman.2005.07.006.

Alderighi, M., Cento, A., Nijkamp, P., & Rietveld, P. (2012). Competition in the European aviation market: The entry of low-cost airlines. *Journal of Transport Geography*, *24*, 223–233. http://dx.doi.org/10.1016/j.jtrangeo.2012.02.008.

Alderighi, M., Nicolini, M., & Piga, C. A. (2015). Combined effects of capacity and time on fares: Insights from the yield management of a low-cost airline. *The Review of Economics and Statistics*, *97*(4), 900–915. http://dx.doi.org/10.1162/REST_a_00451.

Alves, C. F., & Barbot, C. (2007). Do low cost carriers have different corporate governance models? *Journal of Air Transport Management*, *13*(2), 116–120. http://dx.doi.org/10.1016/j.jairtraman.2006.11.001.

Alves, C. F., & Barbot, C. (2009). Price discrimination strategies of low-cost carriers. *Journal of Transport Economics and Policy*, *43*(3), 345–363 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-70350306980&partnerID=tZOtx3y1).

Anderson, W. P., Gong, G., & Lakshmanan, T. R. (2005). Competition in a deregulated market for air travel: The U.S. domestic experience and lessons for global markets.

Research in Transportation Economics, *13*, 3–25. http://dx.doi.org/10.1016/S0739-8859(05)13001-7.
Annarelli, A., & Nonino, F. (2015). Strategic and operational management of organizational resilience: Current state of research and future directions. *Omega*, 1–18. http://dx.doi.org/10.1016/j.omega.2015.08.004.
Arjomandi, A., & Seufert, J. H. (2014). An evaluation of the world's major airlines' technical and environmental performance. *Economic Modelling*, *41*, 133–144. http://dx.doi.org/10.1016/j.econmod.2014.05.002.
Avenali, A., D'Alfonso, T., Leporelli, C., Matteucci, G., Nastasi, A., & Reverberi, P. (2015). An incentive pricing mechanism for efficient airport slot allocation in Europe. *Journal of Air Transport Management*, *42*, 27–36. http://dx.doi.org/10.1016/j.jairtraman.2014.07.009.
Aydemir, R. (2012). Threat of market entry and low cost carrier competition. *Journal of Air Transport Management*, *23*, 59–62. http://dx.doi.org/10.1016/j.jairtraman.2012.01.018.
Bachis, E., & Piga, C. A. (2011). Low-cost airlines and online price dispersion. *International Journal of Industrial Organization*, *29*(6), 655–667. http://dx.doi.org/10.1016/j.ijindorg.2011.02.006.
Balcombe, K., Fraser, I., & Harris, L. (2009). Consumer willingness to pay for in-flight service and comfort levels: A choice experiment. *Journal of Air Transport Management*, *15*(5), 221–226. http://dx.doi.org/10.1016/j.jairtraman.2008.12.005.
Barbot, C. (2006). Low-cost airlines, secondary airports, and state aid: An economic assessment of the Ryanair-Charleroi airport agreement. *Journal of Air Transport Management*, *12*(4), 197–203. http://dx.doi.org/10.1016/j.jairtraman.2006.04.001.
Barbot, C. (2008). Can low cost carriers deter or accommodate entry? *Transportation Research Part E: Logistics and Transportation Review*, *44*(5), 883–893. http://dx.doi.org/10.1016/j.tre.2007.07.010.
Barbot, C. (2009). Airport and airlines competition: Incentives for vertical collusion. *Transportation Research Part B: Methodological*, *43*(10), 952–965. http://dx.doi.org/10.1016/j.trb.2009.04.001.
Barrett, S. D. (1992). Barriers to contestability in the deregulated European aviation market. *Transportation Research Part A*, *26*(2), 159–165. http://dx.doi.org/10.1016/0965-8564(92)90010-5.
Barrett, S. D. (1999). Peripheral market entry, product differentiation, supplier rents and sustainability in the deregulated European aviation market - a case study. *Journal of Air Transport Management*, *5*(1), 21–30. http://dx.doi.org/10.1016/S0969-6997(98)00033-7.
Barrett, S. D. (2000). Airport competition in the deregulated European aviation market. *Journal of Air Transport Management*, *6*(1), 13–27. http://dx.doi.org/10.1016/S0969-6997(99)00018-6.
Bel, G., & Fageda, X. (2009). Privatization, regulation and airport pricing: An empirical analysis for Europe. *Journal of Regulatory Economics*, *37*(2), 142–161. http://dx.doi.org/10.1007/s11149-009-9110-7.
Belobaba, P. P. (2011). Did LCCs save airline revenue management. *Journal of Revenue and Pricing Management*, *10*(1), 19–22. http://dx.doi.org/10.1057/rpm.2010.45.
Bilotkach, V., Gaggero, A. A., & Piga, C. A. (2015). Airline pricing under different market conditions: Evidence from European low-cost carriers. *Tourism Management*, *47*, 152–163. http://dx.doi.org/10.1016/j.tourman.2014.09.015.
Blackstone, E. A., Buck, A. J., & Hakim, S. (2006). Determinants of airport choice in a multi-airport region. *Atlantic Economic Journal*, *34*(3), 313–326. http://dx.doi.org/10.1007/s11293-006-9024-z.
Borenstein, S. (2011). Why can't US airlines make money? *American Economic Review*, *101*(3), 233–237. http://dx.doi.org/10.1257/aer.101.3.233.
Brueckner, J. K., Lee, D., & Singer, E. S. (2013). Airline competition and domestic US airfares: A comprehensive reappraisal. *Economics of Transportation*, *2*(1), 1–17. http://dx.doi.org/10.1016/j.ecotra.2012.06.001.
Budd, L., Francis, G., Humphreys, I., & Ison, S. (2014). Grounded: Characterising the market exit of European low cost airlines. *Journal of Air Transport Management*, *34*, 78–85. http://dx.doi.org/10.1016/j.jairtraman.2013.08.002.
Button, K. (2012). Low-cost airlines: A failed business model? *Transportation Journal*, *51*(2), 197–219. http://dx.doi.org/10.5325/transportationj.51.2.0197.
Button, K., Costa, A., & Cruz, C. (2007). Ability to recover full costs through price discrimination in deregulated scheduled air transport markets. *Transport Reviews*, *27*(2), 213–230. http://dx.doi.org/10.1080/01441640600951949.
Casey, M. E. (2010). Low cost air travel: Welcome aboard? *Tourist Studies*, *10*(2), 175–191. http://dx.doi.org/10.1177/1468797611403061.
Castillo-Manzano, J. I., López-Valpuesta, L., & Pedregal, D. J. (2012). What role will hubs play in the LCC point-to-point connections era? The Spanish experience. *Journal of Transport Geography*, *24*, 262–270. http://dx.doi.org/10.1016/j.jtrangeo.2012.02.009.
Chang, L. -Y., & Hung, S. -C. (2013). Adoption and loyalty toward low cost carriers: The case of Taipei–Singapore passengers. *Transportation Research Part E: Logistics and Transportation Review*, *50*(1), 29–36. http://dx.doi.org/10.1016/j.tre.2012.10.003.
Chung, J. Y., & Whang, T. (2011). The impact of low cost carriers on Korean Island tourism. *Journal of Transport Geography*, *19*(6), 1335–1340. http://dx.doi.org/10.1016/j.jtrangeo.2011.07.004.
Ciliberto, F., & Tamer, E. (2009). Market structure and multiple equilibria in airline markets. *Econometrica*, *77*(6), 1791–1828. http://dx.doi.org/10.3982/ECTA5368.
Coles, T., Fenclova, E., & Dinan, C. (2011). Responsibilities, recession and the tourism sector: Perspectives on CSR among low-fares airlines during the economic downturn in the UK. *Current Issues in Tourism*, *14*(6), 519–536. http://dx.doi.org/10.1080/13683500.2010.544719.
Daft, J., & Albers, S. (2012). A profitability analysis of low-cost long-haul flight operations. *Journal of Air Transport Management*, *19*(1), 49–54. http://dx.doi.org/10.1016/j.jairtraman.2012.01.010.
Danaher, P. J., Roberts, J. H., Roberts, K., & Simpson, A. (2011). Practice prize paper —Applying a dynamic model of consumer choice to guide brand development at Jetstar airways. *Marketing Science*, *30*(4), 586–594. http://dx.doi.org/10.1287/mksc.1100.0619.
Davison, L., & Ryley, T. (2010). Tourism destination preferences of low-cost airline users in the east midlands. *Journal of Transport Geography*, *18*(3), 458–465. http://dx.doi.org/10.1016/j.jtrangeo.2009.07.004.
De Toni, A. F., Nonino, F., & Pivetta, M. (2011). A model for assessing the coherence of companies knowledge strategy. *Knowledge Management Research and Practice*, *9*(4), 327–341. http://dx.doi.org/10.1057/kmrp.2011.36.
Dennis, N. (2007). End of the free lunch? The responses of traditional European airlines to the low-cost carrier threat. *Journal of Air Transport Management*, *13*(5), 311–321. http://dx.doi.org/10.1016/j.jairtraman.2007.04.005.
Detzen, D., Jain, P. K., Likitapiwat, T., & Rubin, R. M. (2012). The impact of low cost airline entry on competition, network expansion, and stock valuations. *Journal of Air Transport Management*, *18*(1), 59–63. http://dx.doi.org/10.1016/j.jairtraman.2011.09.004.
Di Stefano, G., Gambardella, A., & Verona, G. (2012). Technology push and demand pull perspectives in innovation studies: Current findings and future research directions. *Research Policy*, *41*(8), 1283–1295. http://dx.doi.org/10.1016/j.respol.2012.03.021.
Dobruszkes, F. (2006). An analysis of European low-cost airlines and their networks. *Journal of Transport Geography*, *14*(4), 249–264. http://dx.doi.org/10.1016/j.jtrangeo.2005.08.005.
Dobruszkes, F. (2013). The geography of European low-cost airline networks: A contemporary analysis. *Journal of Transport Geography*, *28*, 75–88. http://dx.doi.org/10.1016/j.jtrangeo.2012.10.012.
Dobson, P. W., & Piga, C. A. (2013). The impact of mergers on fares structure: Evidence from european low-cost airlines. *Economic Inquiry*, *51*(2), 1196–1217. http://dx.doi.org/10.1111/j.1465-7295.2011.00392.x.
Domanico, F. (2007). The European airline industry: Law and economics of low cost carriers. *European Journal of Law and Economics*, *23*(3), 199–221. http://dx.doi.org/10.1007/s10657-007-9016-8.
Donzelli, M. (2010). The effect of low-cost air transportation on the local economy: Evidence from southern Italy. *Journal of Air Transport Management*, *16*(3), 121–126. http://dx.doi.org/10.1016/j.jairtraman.2009.07.005.
Dresner, M., Lin, J. S. C., & Windle, R. (1996). The impact of low-cost carriers on airport and route competition. *Journal of Transport Economics and Policy*, *30*(3), 309–328 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-0030436616&partnerID=tZOtx3y1).
Duval, D. T. (2013). Critical issues in air transport and tourism. *Tourism Geographies*, *15*(3), 494–510. http://dx.doi.org/10.1080/14616688.2012.675581.
Elwakil, O. S., Windle, R. J., & Dresner, M. E. (2013). Transborder demand leakage and the US–Canadian air passenger market. *Transportation Research Part E: Logistics and Transportation Review*, *57*, 45–57. http://dx.doi.org/10.1016/j.tre.2013.01.005.
Escobar-Rodríguez, T., & Carvajal-Trujillo, E. (2014). Online purchasing tickets for low cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model. *Tourism Management*, *43*, 70–88. http://dx.doi.org/10.1016/j.tourman.2014.01.017.
Evangelho, F., Huse, C., & Linhares, A. (2005). Market entry of a low cost airline and impacts on the Brazilian business travelers. *Journal of Air Transport Management*, *11*(2), 99–105. http://dx.doi.org/10.1016/j.jairtraman.2004.09.005.
Fageda, X., & Fernández-Villadangos, L. (2009). Triggering competition in the Spanish airline market: The role of airport capacity and low-cost carriers. *Journal of Air Transport Management*, *15*(1), 36–40. http://dx.doi.org/10.1016/j.jairtraman.2008.07.002.
Fageda, X., Jiménez, J. L., & Perdiguero, J. (2011). Price rivalry in airline markets: A study of a successful strategy of a network carrier against a low-cost carrier. *Journal of Transport Geography*, *19*(4), 658–669. http://dx.doi.org/10.1016/j.jtrangeo.2010.07.006.
Fageda, X., Suau-Sanchez, P., & Mason, K. J. (2015). The evolving low-cost business model: Network implications of fare bundling and connecting flights in Europe. *Journal of Air Transport Management*, *42*, 289–296. http://dx.doi.org/10.1016/j.jairtraman.2014.12.002.
Fan, T. (2006). Improvements in intra-European inter-city flight connectivity: 1996-2004. *Journal of Transport Geography*, *14*(4), 273–286. http://dx.doi.org/10.1016/j.jtrangeo.2005.08.006.
Ferrer-Rosell, B., Martínez-Garcia, E., & Coenders, G. (2014). Package and no-frills air carriers as moderators of length of stay. *Tourism Management*, *42*, 114–122. http://dx.doi.org/10.1016/j.tourman.2013.11.002.
Flouris, T., & Walker, T. J. (2005). The financial performance of low-cost and full-service airlines in times of crisis. *Canadian Journal of Administrative Sciences*, *22*(1), 3–20 (Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-19744374589&partnerID=40&md5=20122eba7a7ffc7e616754c501e532a5).
Forsyth, P. (2003). Low-cost carriers in Australia: Experiences and impacts. *Journal of Air Transport Management*, *9*(5), 277–284. http://dx.doi.org/10.1016/S0969-6997(03)00035-8.
Forsyth, P. (2007). The impacts of emerging aviation trends on airport infrastructure. *Journal of Air Transport Management*, *13*(1), 45–52. http://dx.doi.org/10.1016/j.jairtraman.2006.10.004.
Fourie, C., & Lubbe, B. (2006). Determinants of selection of full-service airlines and low-cost carriers—A note on business travellers in South Africa. *Journal of Air Transport Management*, *12*(2), 98–102. http://dx.doi.org/10.1016/j.jairtraman.2005.11.008.
Francis, G., Fidato, A., & Humphreys, I. (2003). Airport–airline interaction: The impact of low-cost carriers on two European airports. *Journal of Air Transport Management*, *9*(4), 267–273. http://dx.doi.org/10.1016/S0969-6997(03)00004-8.
Francis, G., Humphreys, I., & Ison, S. (2004). Airports' perspectives on the growth of low-cost airlines and the remodeling of the airport-airline relationship. *Tourism Management*, *25*(4), 507–514. http://dx.doi.org/10.1016/S0261-5177(03)00121-3.
Francis, G., Humphreys, I., Ison, S., & Aicken, M. (2006). Where next for low cost airlines? A spatial and temporal comparative study. *Journal of Transport Geography*, *14*(2), 83–94. http://dx.doi.org/10.1016/j.jtrangeo.2005.05.005.
Franke, M. (2004). Competition between network carriers and low-cost carriers—Retreat battle or breakthrough to a new level of efficiency? *Journal of Air Transport Management*, *10*(1), 15–21. http://dx.doi.org/10.1016/j.jairtraman.2003.10.008.
Franke, M. (2007). Innovation: The winning formula to regain profitability in aviation? *Journal of Air Transport Management*, *13*(1), 23–30. http://dx.doi.org/10.1016/j.jairtraman.2006.11.003.
Fu, X., Dresner, M., & Oum, T. H. (2011). Effects of transport service differentiation in the US domestic airline market. *Transportation Research Part E: Logistics and Transportation Review*, *47*(3), 297–305. http://dx.doi.org/10.1016/j.tre.2010.11.002.

Fu, X., Lijesen, M., & Oum, T. H. (2006). An analysis of airport pricing and regulation in the presence of competition between full service airlines and low cost carriers. *Journal of Transport Economics and Policy*, *40*(3), 425–447 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-33750382539&partnerID=tZOtx3y1).

Fu, X., Oum, T. H., & Zhang, A. (2010). Air transport liberalization and its impacts on airline competition and air passenger traffic. *Transportation Journal*, *49*(4), 24–41 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-78649818964&partnerID=tZOtx3y1).

Fu, X., Zhang, A., & Lei, Z. (2012). Will China's airline industry survive the entry of high-speed rail? *Research in Transportation Economics*, *35*(1), 13–25. http://dx.doi.org/10.1016/j.retrec.2011.11.006.

Fuellhart, K. (2003). Inter-metropolitan airport substitution by consumers in an asymmetrical airfare environment: Harrisburg, Philadelphia and Baltimore. *Journal of Transport Geography*, *11*(4), 285–296. http://dx.doi.org/10.1016/S0966-6923(03)00005-X.

Gillen, D., & Lall, A. (2004). Competitive advantage of low-cost carriers: Some implications for airports. *Journal of Air Transport Management*, *10*(1), 41–50. http://dx.doi.org/10.1016/j.jairtraman.2003.10.009.

Gillen, D., & Morrison, W. (2003). Bundling, integration and the delivered price of air travel: Are low cost carriers full service competitors? *Journal of Air Transport Management*, *9*(1), 15–23. http://dx.doi.org/10.1016/S0969-6997(02)00071-6.

Gorin, T., & Belobaba, P. (2004). Impacts of entry in airline markets: Effects of revenue management on traditional measures of airline performance. *Journal of Air Transport Management*, *10*(4), 259–270. http://dx.doi.org/10.1016/j.jairtraman.2004.03.002.

Gorin, T., & Belobaba, P. (2008). Assessing predation in airline markets with low-fare competition. *Transportation Research Part A: Policy and Practice*, *42*(5), 784–798. http://dx.doi.org/10.1016/j.tra.2008.01.016.

Graham, M. (2009). Different models in different spaces or liberalized optimizations? Competitive strategies among low-cost carriers. *Journal of Transport Geography*, *17*(4), 306–316. http://dx.doi.org/10.1016/j.jtrangeo.2009.02.004.

Greer, M. R. (2006). Are the discount airlines actually more efficient than the legacy carriers?: A data envelopment analysis. *International Journal of Transport Economics*, *33*(1), 37–55 (Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-33645469064&partnerID=40&md5=aa05152b5c870d903088d68b919a9d73).

Grigolon, A. B., Kemperman, A. D. A. M., & Timmermans, H. J. P. (2012). The influence of low-fare airlines on vacation choices of students: Results of a stated portfolio choice experiment. *Tourism Management*, *33*(5), 1174–1184. http://dx.doi.org/10.1016/j.tourman.2011.11.013.

Han, H. (2013). Effects of in-flight ambience and space/function on air travelers' decision to select a low-cost airline. *Tourism Management*, *37*, 125–135. http://dx.doi.org/10.1016/j.tourman.2013.01.008.

Hanaoka, S., Takebayashi, M., Ishikura, T., & Saraswati, B. (2014). Low-cost carriers versus full service carriers in ASEAN: The impact of liberalization policy on competition. *Journal of Air Transport Management*, *40*, 96–105. http://dx.doi.org/10.1016/j.jairtraman.2014.06.008.

Hazledine, T. (2008). Competition and competition policy in the trans-Tasman air travel market. *The Australian Economic Review*, *41*(4), 337–348. http://dx.doi.org/10.1111/j.1467-8462.2008.00508.x.

Hazledine, T. (2010). Pricing, competition and policy in Australasian air travel markets. *Journal of Transport Economics and Policy*, *44*(1), 37–58 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-76749086527&partnerID=tZOtx3y1).

Hazledine, T. (2011). Legacy carriers fight back: Pricing and product differentiation in modern airline marketing. *Journal of Air Transport Management*, *17*(2), 129. http://dx.doi.org/10.1016/j.jairtraman.2011.02.011.

Hernandez, M. A., & Wiggins, S. N. (2014). Nonlinear pricing strategies and competitive conditions in the airline industry. *Economic Inquiry*, *52*(2), 539–561. http://dx.doi.org/10.1111/ecin.12045.

Hofer, C., Windle, R. J., & Dresner, M. E. (2008). Price premiums and low cost carrier competition. *Transportation Research Part E: Logistics and Transportation Review*, *44*(5), 864–882. http://dx.doi.org/10.1016/j.tre.2007.03.004.

Homsombat, W., Lei, Z., & Fu, X. (2011). Development status and prospects for aviation hubs — A comparative study of the major airports in South-East Asia. *The Singapore Economic Review*, *56*(04), 573–591. http://dx.doi.org/10.1142/S0217590811004420.

Homsombat, W., Lei, Z., & Fu, X. (2014). Competitive effects of the airlines-within-airlines strategy – Pricing and route entry patterns. *Transportation Research Part E: Logistics and Transportation Review*, *63*, 1–16. http://dx.doi.org/10.1016/j.tre.2013.12.008.

Ishii, J., Jun, S., & Van Dender, K. (2009). Air travel choices in multi-airport markets. *Journal of Urban Economics*, *65*(2), 216–227. http://dx.doi.org/10.1016/j.jue.2008.12.001.

Jou, R. -C., Lin, C. -C., & Wu, K. -F. (2013). The impact of income on airfare pricing. *Transportmetrica A: Transport Science*, *9*(1), 11–27. http://dx.doi.org/10.1080/18128602.2010.517574.

Kawamori, T., & Lin, M. H. (2013). Airline mergers with low cost carriers. *Economics of Transportation*, *2*(2–3), 63–71. http://dx.doi.org/10.1016/j.ecotra.2013.04.001.

Kim, Y. K., & Lee, H. R. (2011). Customer satisfaction using low cost carriers. *Tourism Management*, *32*(2), 235–243. http://dx.doi.org/10.1016/j.tourman.2009.12.008.

Klophaus, R. (2005). Frequent flyer programs for European low-cost airlines: Prospects, risks and implementation guidelines. *Journal of Air Transport Management*, *11*(5), 348–353. http://dx.doi.org/10.1016/j.jairtraman.2005.07.001.

Koenigsberg, O., Muller, E., & Vilcassim, N. J. (2008). EasyJet® pricing strategy: Should low-fare airlines offer last-minute deals? *Quantitative Marketing and Economics*, *6*(3), 279–297. http://dx.doi.org/10.1007/s11129-007-9036-2.

Kua, J., & Baum, T. (2004). Perspectives on the development of low-cost airlines in south-East Asia. *Current Issues in Tourism*, *7*(3), 262–276 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-4143072582&partnerID=tZOtx3y1).

Lawton, T. C. (1999). The limits of price leadership: Needs-based positioning strategy and the long-term competitiveness of Europe's low fare airlines. *Long Range Planning*, *32*(6), 273–586 (Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-00388073l8&partnerID=40&md5=414d06244534b54c7583d0087fd6b331).

Lawton, T. C., & Solomko, S. (2005). When being the lowest cost is not enough: Building a successful low-fare airline business model in Asia. *Journal of Air Transport Management*, *11*(6), 355–362. http://dx.doi.org/10.1016/j.jairtraman.2005.03.001.

Legeza, E., Selymes, P., & Torok, A. (2010). Investigation of European air transport traffic by utility-based decision model. *Aviation*, *14*(3), 90–94. http://dx.doi.org/10.3846/aviation.2010.14.

Lin, M. H. (2012). Airlines-within-airlines strategies and existence of low-cost carriers. *Transportation Research Part E: Logistics and Transportation Review*, *48*(3), 637–651. http://dx.doi.org/10.1016/j.tre.2011.11.004.

Liu, C. M. (2009). Entry behaviour and financial distress: An empirical analysis of the US domestic airline industry. *Journal of Transport Economics and Policy*, *43*(2), 237–256 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-67650751668&partnerID=tZOtx3y1).

Low, J. M. W., & Lee, B. K. (2014). Effects of internal resources on airline competitiveness. *Journal of Air Transport Management*, *36*, 23–32. http://dx.doi.org/10.1016/j.jairtraman.2013.12.001.

Lu, C. (2009). The implications of environmental costs on air passenger demand for different airline business models. *Journal of Air Transport Management*, *15*(4), 158–165. http://dx.doi.org/10.1016/j.jairtraman.2008.09.019.

Lu, W. -M., Wang, W. -K., Hung, S. -W., & Lu, E. -T. (2012). The effects of corporate governance on airline performance: Production and marketing efficiency perspectives. *Transportation Research Part E: Logistics and Transportation Review*, *48*(2), 529–544. http://dx.doi.org/10.1016/j.tre.2011.09.003.

Malighetti, P., Paleari, S., & Redondi, R. (2009). Pricing strategies of low-cost airlines: The Ryanair case study. *Journal of Air Transport Management*, *15*(4), 195–203. http://dx.doi.org/10.1016/j.jairtraman.2008.09.017.

Malighetti, P., Paleari, S., & Redondi, R. (2010). Has Ryanair's pricing strategy changed over time? An empirical analysis of its 2006–2007 flights. *Tourism Management*, *31*(1), 36–44. http://dx.doi.org/10.1016/j.tourman.2009.02.007.

Malighetti, P., Redondi, R., & Salanti, A. (2014). Competitive vs. monopolistic routes: Are fares so different? *Research in Transportation Economics*, *45*, 3–8. http://dx.doi.org/10.1016/j.retrec.2014.07.001.

Malighetti, P., Stefano, P., & Redondi, R. (2013). The low-cost fare response to new entry. *European Transport Research Review*, *5*(4), 185–194. http://dx.doi.org/10.1007/s12544-013-0098-9.

Mantin, B., & Koo, B. (2009). Dynamic price dispersion in airline markets. *Transportation Research Part E: Logistics and Transportation Review*, *45*(6), 1020–1029. http://dx.doi.org/10.1016/j.tre.2009.04.013.

Martínez-Garcia, E., Ferrer-Rosell, B., & Coenders, G. (2012). Profile of business and leisure travelers on low cost carriers in Europe. *Journal of Air Transport Management*, *20*, 12–14. http://dx.doi.org/10.1016/j.jairtraman.2011.09.002.

Mason, K. (2006). The value and usage of ticket flexibility for short haul business travellers. *Journal of Air Transport Management*, *12*(2), 92–97. http://dx.doi.org/10.1016/j.jairtraman.2006.01.002.

Mason, K. J. (2000). The propensity of business travellers to use low cost airlines. *Journal of Transport Geography*, *8*(2), 107–119. http://dx.doi.org/10.1016/S0966-6923(99)00032-0.

Mason, K. J. (2001). Marketing low-cost airline services to business travellers. *Journal of Air Transport Management*, *7*(2), 103–109. http://dx.doi.org/10.1016/S0969-6997(00)00036-3.

Mason, K. J. (2005). Observations of fundamental changes in the demand for aviation services. *Journal of Air Transport Management*, *11*(1), 19–25. http://dx.doi.org/10.1016/j.jairtraman.2004.11.007.

Melo Filho, C. R., Salgado, L. H., Sato, R., & Oliveira, A. V. M. (2014). Modeling the effects of wage premiums on airline competition under asymmetric economies of density: A case study from Brazil. *Journal of Air Transport Management*, *36*, 59–68. http://dx.doi.org/10.1016/j.jairtraman.2013.12.010.

Merkert, R., & Hensher, D. A. (2011). The impact of strategic management and fleet planning on airline efficiency — A random effects tobit model based on DEA efficiency scores. *Transportation Research Part A: Policy and Practice*, *45*(7), 686–695. http://dx.doi.org/10.1016/j.tra.2011.04.015.

Mikulić, J., & Prebežac, D. (2011). What drives passenger loyalty to traditional and low-cost airlines? A formative partial least squares approach. *Journal of Air Transport Management*, *17*(4), 237–240. http://dx.doi.org/10.1016/j.jairtraman.2010.09.005.

Morandi, V., Malighetti, P., Paleari, S., & Redondi, R. (2015). Codesharing agreements by low-cost carriers: An explorative analysis. *Journal of Air Transport Management*, *42*, 184–191. http://dx.doi.org/10.1016/j.jairtraman.2014.10.004.

Morrell, P. (2005). Airlines within airlines: An analysis of US network airline responses to low cost carriers. *Journal of Air Transport Management*, *11*(5), 303–312. http://dx.doi.org/10.1016/j.jairtraman.2005.07.002.

Morrell, P. (2009). Can long-haul low-cost airlines be successful? *Research in Transportation Economics*, *24*(1), 61–67. http://dx.doi.org/10.1016/j.retrec.2009.01.003.

Müller, K., Hüschelrath, K., & Bilotkach, V. (2012). The construction of a low-cost airline network - facing competition and exploring new markets. *Managerial and Decision Economics*, *33*(7–8), 485–499. http://dx.doi.org/10.1002/mde.2561.

Munusamy, J., Chelliah, S., & Pandian, S. (2011). Customer satisfaction delivery in airline industry in Malaysia: A case of low cost carrier. *Australian Journal of Basic and Applied Sciences*, *5*(11), 718–723 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84155179106&partnerID=tZOtx3y1).

Murakami, H. (2011a). Empirical analysis of inter-firm rivalry between Japanese full-service and low-cost carriers. *Pacific Economic Review*, *16*(1), 103–119. http://dx.doi.org/10.1111/j.1468-0106.2010.00537.x.

Murakami, H. (2011b). Time effect of low-cost carrier entry and social welfare in US large air markets. *Transportation Research Part E: Logistics and Transportation Review*, *47*(3), 306–314. http://dx.doi.org/10.1016/j.tre.2010.11.003.

Oliveira, A. V. M. (2008). An empirical model of low-cost carrier entry. *Transportation Research Part A: Policy and Practice*, *42*(4), 673–695. http://dx.doi.org/10.1016/j.tra.2008.01.025.

Oliveira, A. V. M., & Huse, C. (2009). Localized competitive advantage and price reactions to entry: Full-service vs. low-cost airlines in recently liberalized emerging markets.

Transportation Research Part E: Logistics and Transportation Review, *45*(2), 307–320. http://dx.doi.org/10.1016/j.tre.2008.09.003.
Papatheodorou, A., & Arvanitis, P. (2009). Spatial evolution of airport traffic and air transport liberalisation: The case of Greece. *Journal of Transport Geography*, *17*(5), 402–412. http://dx.doi.org/10.1016/j.jtrangeo.2008.08.004.
Pearson, J., & Merkert, R. (2014). Airlines-within-airlines: A business model moving east. *Journal of Air Transport Management*, *38*, 21–26. http://dx.doi.org/10.1016/j.jairtraman.2013.12.014.
Pearson, J., O'Connell, J. F., Pitfield, D., & Ryley, T. (2015). The strategic capability of Asian network airlines to compete with low-cost carriers. *Journal of Air Transport Management*, *47*, 1–10. http://dx.doi.org/10.1016/j.jairtraman.2015.03.006.
Pels, E. (2009). Network competition in the open aviation area. *Journal of Air Transport Management*, *15*(2), 83–89. http://dx.doi.org/10.1016/j.jairtraman.2008.09.001.
Pels, E., & Rietveld, P. (2004). Airline pricing behaviour in the London–Paris market. *Journal of Air Transport Management*, *10*(4), 277–281. http://dx.doi.org/10.1016/j.jairtraman.2004.03.005.
Pels, E., Njegovan, N., & Behrens, C. (2009). Low-cost airlines and airport competition. *Transportation Research Part E: Logistics and Transportation Review*, *45*(2), 335–344. http://dx.doi.org/10.1016/j.tre.2008.09.005.
Pilkington, A., & Meredith, J. (2009). The evolution of the intellectual structure of operations management — 1980–2006 : A citation/co-citation analysis. *Journal of Operations Management*, *27*, 185–202. http://dx.doi.org/10.1016/j.jom.2008.08.001.
Pitfield, D. E. (2005a). A time series analysis of the pricing behaviour of directly competitive "low-cost" airlines. *International Journal of Transport Economics*, *32*(1), 15–38 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-15044352929&partnerID=tZOtx3y1).
Pitfield, D. E. (2005b). Some speculations and empirical evidence on the oligopolistic behaviour of competing low-cost airlines. *Journal of Transport Economics and Policy*, *39*(3), 379–390 (Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-27844518319&partnerID=40&md5=131db7d6e39a79d674233a753ee5ecf7).
Pitfield, D. E. (2007). Ryanair's impact on airline market share from the London area airports: A time series analysis. *Journal of Transport Economics and Policy*, *41*(1), 75–92 (Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-33847008049&partnerID=tZOtx3y1).
Pitfield, D. E. (2008). The southwest effect: A time-series analysis on passengers carried by selected routes and a market share comparison. *Journal of Air Transport Management*, *14*(3), 113–122. http://dx.doi.org/10.1016/j.jairtraman.2008.02.006.
Pitfield, D. E. (2009). Some insights into competition between low-cost airlines. *Research in Transportation Economics*, *24*(1), 5–14. http://dx.doi.org/10.1016/j.retrec.2009.01.007.
Prince, J. T., & Simon, D. H. (2015). Do incumbents improve service quality in response to entry? Evidence from Airlines' on-time performance. *Management Science*, *61*(2), 372–390. http://dx.doi.org/10.1287/mnsc.2014.1918.
Pulina, M., & Cortés-Jiménez, I. (2010). Have low-cost carriers influenced tourism demand and supply? The case of Alghero, Italy. *Tourism Analysis*, *15*(6), 617–635. http://dx.doi.org/10.3727/108354210X12889831783350.
Ramón-Rodríguez, A. B., Moreno-Izquierdo, L., & Perles-Ribes, J. F. (2011). Growth and internationalisation strategies in the airline industry. *Journal of Air Transport Management*, *17*(2), 110–115. http://dx.doi.org/10.1016/j.jairtraman.2010.11.002.
Ramos-Rodríguez, A., & Ruíz-Navarro, J. (2004). Changes in the intellectual structure of strategic management research: A bibliometric study of the strategic management journal, 1980–2000. *Strategic Management Journal*, *25*, 981–1004.
Rose, J. M., Hensher, D. A., & Greene, W. H. (2005). Recovering costs through price and service differentiation: Accounting for exogenous information on attribute processing strategies in airline choice. *Journal of Air Transport Management*, *11*(6), 400–407. http://dx.doi.org/10.1016/j.jairtraman.2005.05.005.
Rosselló, J., & Riera, A. (2012). Pricing European package tours: The impact of new distribution channels and low-cost airlines. *Tourism Economics*, *18*(2), 265–279. http://dx.doi.org/10.5367/te.2012.0121.
Rowlands, I. (1999). Patterns of author cocitation in information policy: Evidence of social, collaborative and cognitive structure. *Scientometrics*, *44*(3), 533–546.
Rubin, R. M., & Joy, J. N. (2005). Where are the airlines headed? Implications of airline industry structure and change for consumers. *Journal of Consumer Affairs*, *39*(1), 215–228 (Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-20144381374&partnerID=40&md5=aa170afe66422c8e7c3b4507f825a11e).
Ryley, T., & Davison, L. (2008). UK air travel preferences: Evidence from an east midlands household survey. *Journal of Air Transport Management*, *14*(1), 43–46. http://dx.doi.org/10.1016/j.jairtraman.2007.08.005.
Salanti, A., Malighetti, P., & Redondi, R. (2012). Low-cost pricing strategies in leisure markets. *Tourism Management*, *33*(2), 249–256. http://dx.doi.org/10.1016/j.tourman.2011.03.003.
Sauter-Servaes, T., & Nash, A. (2007). Applying low-cost airline pricing strategies to European railroads. *Transportation Research Record*, *1995*, 1–8. http://dx.doi.org/10.3141/1995-01.
Seo, K., Moon, J., & Lee, S. (2015). Synergy of corporate social responsibility and service quality for airlines: The moderating role of carrier type. *Journal of Air Transport Management*, *47*, 126–134. http://dx.doi.org/10.1016/j.jairtraman.2015.05.011.
Shafique, M. (2013). Thinking inside the box? Intellectual structure of the knowledge base of innovation research (1988–2008). *Strategic Management Journal*, *34*(1), 62–93.
Tretheway, M. (2011). Comment on " legacy carriers fight back.". *Journal of Air Transport Management*, *17*(1), 40–43. http://dx.doi.org/10.1016/j.jairtraman.2010.10.009.
Tretheway, M. W. (2004). Distortions of airline revenues: Why the network airline business model is broken. *Journal of Air Transport Management*, *10*(1), 3–14. http://dx.doi.org/10.1016/j.jairtraman.2003.10.010.
Vowles, T. M. (2000). The effect of low fare air carriers on airfares in the US. *Journal of Transport Geography*, *8*(2), 121–128. http://dx.doi.org/10.1016/S0966-6923(99)00033-2.
Vowles, T. M. (2006). Airfare pricing determinants in hub-to-hub markets. *Journal of Transport Geography*, *14*(1), 15–22. http://dx.doi.org/10.1016/j.jtrangeo.2004.10.004.
Warnock-Smith, D., & Potter, A. (2005). An exploratory study into airport choice factors for European low-cost airlines. *Journal of Air Transport Management*, *11*(6), 388–392. http://dx.doi.org/10.1016/j.jairtraman.2005.05.003.
White, H. D., & McCain, K. W. (1998). Visualizing a discipline: An author co-citation analysis of information science, 1972-1995. *Journal of the American Society for Information Science*, *49*(4), 327–355.
Whyte, R., Prideaux, B., & Sakata, H. (2012). The evolution of virgin Australia from a low-cost carrier to a full-service airline - implications for the tourism industry. *Advances in Hospitality and Leisure*, *8*, 215–231. http://dx.doi.org/10.1108/S1745-3542(2012)0000008015.
Windle, R., & Dresner, M. (1999). Competitive responses to low cost carrier entry. *Transportation Research Part E: Logistics and Transportation Review*, *35*(1), 59–75. http://dx.doi.org/10.1016/S1366-5545(98)00025-8.
de Wit, J. G., & Zuidberg, J. (2012). The growth limits of the low cost carrier model. *Journal of Air Transport Management*, *21*, 17–23. http://dx.doi.org/10.1016/j.jairtraman.2011.12.013.
Wittman, M. D. (2014). Are low-cost carrier passengers less likely to complain about service quality? *Journal of Air Transport Management*, *35*, 64–71. http://dx.doi.org/10.1016/j.jairtraman.2013.11.008.
Wittmer, A., & Rowley, E. (2014). Customer value of purchasable supplementary services: The case of a European full network carrier's economy class. *Journal of Air Transport Management*, *34*, 17–23. http://dx.doi.org/10.1016/j.jairtraman.2013.07.002.
Yang, K. -C., Hsieh, T. -C., Li, H., & Yang, C. (2012). Assessing how service quality, airline image and customer value affect the intentions of passengers regarding low cost carriers. *Journal of Air Transport Management*, *20*, 52–53. http://dx.doi.org/10.1016/j.jairtraman.2011.12.007.
Zhang, A., Hanaoka, S., Inamura, H., & Ishikura, T. (2008). Low-cost carriers in Asia: Deregulation, regional liberalization and secondary airports. *Research in Transportation Economics*, *24*(1), 36–50. http://dx.doi.org/10.1016/j.retrec.2009.01.001.
Zhang, Q., Yang, H., Wang, Q., & Zhang, A. (2014). Market power and its determinants in the Chinese airline industry. *Transportation Research Part A: Policy and Practice*, *64*, 1–13. http://dx.doi.org/10.1016/j.tra.2014.03.003.
Zhang, S., Derudder, B., & Witlox, F. (2013). The impact of hub hierarchy and market competition on airfare pricing in US hub-to-hub markets. *Journal of Air Transport Management*, *32*, 65–70. http://dx.doi.org/10.1016/j.jairtraman.2013.06.016.