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Tourism industry constitutes a major economic issue for France (6.2% of the Gross Domestic Product). France is the first tourism destination in the world in terms of arrival numbers but generates less revenue than other countries like Spain (Randriamboarison, 2003). This contradiction is commonly called the “*French tourism paradox*”. The globalization context cause considerable instability in tourist demand, consumer behaviour and travel motivations. Through their travels, tourists express themselves (adventure tourism), show originality (choice of a particular type of accommodation) or commitment (fair tourism). Therefore, tourism products and destinations are increasing and, as shown in figure 1, the current issue of tourism destinations is to surpass the competitors.

Figure 1. Tourism, “doing things right” and “doing things better”

In this context, destinations' performance and competitiveness are questioned and ski resorts are not an exception to the rule (Fabry, 2008). France is one of the top three "white" tourism destinations in the world. However, in 2009, the ski industry has declined by 11% and predictions say that within 2015, the number of skiers will fall by 13% (Gerbaux *et al.*, 2004).

Table 1 shows the evolution of the ski-passes¹ sold during winter seasons in the French massifs (Pyrenees, Alps, Jura, Vosges and Massif Central) and in the Pyrenean massif particularly. It highlights stagnation or decrease of tourist attendance.

Table 1. Ski-passes sold evolution in Pyrenean massif and in all the French massifs

	Number of ski-passes sold (millions)					
Seasons	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Pyrenean massif	6	4,2	4,5	5,7	5,2	5
Evolution (n-1)		- 30 %	+ 7,1 %	+ 8,8 %	- 8,8 %	- 3,8 %
Total of French massifs	55,6	47,7	54,9	58,6	56,1	53,2
Evolution (n-1)		- 14,3 %	+ 15,2 %	+ 6,7 %	- 4,3 %	- 5,1 %

SOURCE: DOMAINES SKIABLES DE FRANCE, DSF²

Even if the potential global demand remains high, the pressure coming from new entrants, which are less expensive, more technical (e.g. Slovenia, Montenegro) and propose an offer adapted to the new consumption practices, increase competition and cause considerable instability in tourist demand (Goncalves *et al.*, 2012).

Consumers' behavior is changing in terms of accommodation needs and ski area quality (ski-lift comfort, snow quality). Moreover, climate change is a crucial determinant influencing the business performance of low and medium elevation ski resorts (Bachimon *et al.*, 2009, Richard *et al.*, 2010), and generates important costs of artificial snow production conditioning by the snow depth. For some destinations, the investments to maintain the offer level in terms of snow quality constitute an important difficulty given the previous investments (investments in terms of ski-lifts were still high in 2009 – 296 millions³).

In this context, destination decision and attractiveness are questioned. In this paper, Pyrenean ski resorts performance is analyzed. Pyrenean ski resorts constitute 9.4% of market share (number of ski-passes) and are represented by 29 ski-lift operators (DSF, Septembre 2011).

The ski-lift operator: principal actor of ski resorts competitiveness

The maintenance or development of tourism activities is a crucial issue for tourism destinations which have emerged as the fundamental unit of analysis in tourism (Botti,

2011). In this article, we follow Ritchie and Crouch (2003) which emphasize that as tourism businesses, destinations compete. Accordingly to these authors and considering the theoretical framework of Porter (1990), destination success is determined by two different advantages: on the one hand, comparative advantages reflect destination resources endowment, on the other hand, competitive advantages are those that have been established as a result of effective resources deployment. In this line, tourism destination competitiveness partly depends on decision-makers ability to add value to available resources. Destination management can in consequence be considered to be strategic and tourism decision makers must take steps by steps scheme to enforce the touristicity of their destination. Several recent studies on destination competitiveness have adopted this perspective (e.g. Botti *et al.*, 2008 ; Gomezelj, Mihalic, 2008 ; Cracolici, Nijkamp, 2009).

Botti (2011) considers a tourism destination as a system which can be regarded as a virtual company using and managing resources to offer products to target markets. Therefore, destination ski resort can be represented by different stakeholders (figure 2). This study considers that ski resorts' competitiveness can be approach by ski-lift operators' performance since it's the primary attraction of the territory. However, the others stakeholders like hotels, restaurants or transports remain important and influence destination competitiveness. The local community which depends on the tourism economic situation has also an impact on destination competitiveness since tourism is based on experiences between visitors and visited (Férréol Mamontoff, 2009). Public authorities also play an important role in tourism development planning through the ski-lift operator and/or tourism office (depending on the governance modes). Moreover, the natural environment on which the destinations attractiveness is also important.

Figure 2. Ski resort destination and stakeholders

A ski resort is a kind of district (Bailly, 2002) composed by several stakeholders which have different interests and goals. In a destination, the attraction is the more important determinant as it generates the visit (Botti *et al.*, 2006) and attracts the tourists. In this article, ski area is assimilated to the « primary » attraction of the destination (figure 2) which influences the tourists' decision. This study analyses

particularly the ski-lift operators which constitutes the principal stakeholder of winter destination. In fact, the economic activity of the others stakeholders (hotels, restaurants, ski schools, etc.) depends largely on the attractiveness of the ski area. Accordingly with Domaines Skiabiles de France (2010), skiing is so far the major determinant of winter tourism. All sports (alpine skiing, snowboarding) require infrastructures such as ski-lifts. So, there are crucial determinants influencing the destination business performance, and an important part of ski resort attractiveness depends on ski-lift operator management and performance since they constitute the key product of the ski resort.

Let us take the example of “Paradiski” which links two ski areas “La Plagne” and “Les Arcs” permitting to compete with the best alpine ski resorts and highlights the existence of “Peisey-Vallandry”, a little village. Finally, to legitimate the use of the ski-lift operator to analyze destination competitiveness, the literature around the servuction system is adopted.

Ski resort performance evaluation and functional dimension of the servicescape

The production process of service has been called the “*servuction*” process by Eiglier et Langeard (1987). They have defined three factors that directly influence customers’ service experience: the servicescape, contact personnel and other customers. Given the importance of servicescape in creating the customer’s experience, it is considered as a very important factor. This is especially true in the case of ski resorts where ski-lifts infrastructures and physical surroundings are necessary to access to the ski area. The academic literature distinguishes two important aspects of servicescape suggested by Bitner (2000). The first approach considers the impact of physical surroundings on consumers’ behavior. It corresponds to the aesthetic and ambient dimensions of the servicescape (atmospherics, physical design, decor elements). The second approach corresponds to the functional dimension of the servicescape. According to Eiglier (2010), the servicescape is composed, on the one hand, by the space where the service is provided and, on the other hand, by the layout, equipments and furnishings. This paper analyses ski resorts’ performance through this functional dimension of the servicescape. Finally, this study approach ski resorts’ competitiveness by ski-lifts’ operators which manage a servicescape composed by layout (slopes) and equipment (ski-lifts...).

Pyrenean ski resorts benchmarking

Aside from their local markets, relatively captive, ski resorts with comparable ski areas present in the same mountain are in competition with each others. This paper proposes a comparative analysis of the Pyrenean ski resorts by analyzing ski-lift operator performance through the servicescape functional dimension. The DEA (Data Envelopment Analysis) method used is a tool of benchmarking which operates in two times⁴. First, the best practices are identified and constitute reference sets in terms of organizational and managerial skills, “the benchmarks”, to the inefficient ski resorts. The resources level used by efficient ski resorts allow them to reach an optimal level of production. It means that managers ensure a good balance between inputs and outputs.

The less efficient destinations can improve their performance in better allocate their resources. This empirical study was realized by the CAPEM⁵ laboratory of the University of Perpignan Via Domitia. The sample is composed by 20 Pyrenean ski resorts and concerns the 2009-2010 season (figure 3).

Figure 3. Pyrenean ski resorts sample

Performance level of each ski resort is determined given the resources used and the outcomes produced (table 2). Given the best practices and the performance levels, this method permits to determine possible production improvements (turnover and number of ski-passes sold).

Table 2. Data collection

Variables	Indicators ⁶	Indicators' definition
Outputs	Ski-lifts operator's turnover	Performance
	Total number of ski-passes sold	Customer-flow
Inputs	Number of permanent employees	Internal organisation
	Total number of the ski area's opening days	Capacity -access
	Total number of slopes	Capacity -infrastructure

A number of points emerge from the present study. Results in table 3 reveal that nine ski resorts under twenty are efficient in terms of ski area management. Thus, Les Angles, Font-Romeu-Pyrenees 2000, Ax-les-Thermes, Mijanes-Donzan, Mont-d'Olmes, Tourmalet Cauterets, Saint-Lary-Soulan and Gourette are identified as efficient ski resorts since they optimize their resource allocation. Their attendance strategies permit to reach an optimal production level. The inefficient ski resorts (Porté-Puymorens, Cambre d'Aze, Formiguères, Puigmal, Guzet, Luchon-Superbagnères, Gavarnie, Piau-Engaly, Luz-Ardiden, la Pierre-St Martin et Artouste) haven't reached their optimum and according to the best practices, they can improve their performance. With the same level of inputs, these ski resorts must increase their output level from 0.11% to 158.86% (table 3). According to their resources allocation, Guzet, Gavarnie and Artouste are the less efficient resorts and their strategies are

questioned. This methodology provides benchmarks by defining a reference point to reached in terms of organization and management. Therefore, Guzet's benchmarks are Mijanes-Donzan, Mont-d'Olmes and Tourmalet ; Gavarnie's benchmarks are Mijanes-Donzan, Tourmalet and Saint-Lary-Soulan ; Artouste's benchmarks are Mijanes-Donzan, Saint-Lary-Soulan and Gourette.

Table 3. Performance evaluation of Pyrenean ski resorts

		<i>Inputs</i>			<i>Outputs</i>			
N°	Ski resorts	Number of permanent employees	Total number of slopes	Total number of the ski area's opening days	Ski-lifts operator's turnover 2009-2010	Total number of ski-passes sold	Possible improvements	Benchmarks
1	Les Angles	178	32	135	8'296'726,1	356'553	0%	1
2	Porte-Puymorens	50	22	110	1'290'906,7	77'177	77.25%	9, 10, 14
3	Font-Romeu-Pyrénées 2000	189	41	135	9'605'452	477'641	0%	3
4	Espace Cambre d'Aze	59	22	94	1'622'927	118'777	9.74%	7, 9, 10, 13
5	Formigüères	50	17	118	1'797'952	99'200	20.26%	9, 14
6	Puigmal	45	32	106	1'583'877	93'350	22.49%	9, 10, 14
7	Ax les thermes	125	29	124	6'398'000	342'846	0%	7
8	Guzet	71	31	100	1'302'941	82'746	112.41%	9, 10, 13
9	Mijanes-Donzan	20	13	86	186'895	17'574	0%	9
10	Monts-d'Olmes	34	17	100	1'156'000	86'800	0%	10
11	Luchon-Superbagnères	95	27	100	3'353'060	184'644	20.98%	7, 9, 13, 17
12	Gavarnie	55	29	91	703'956	52'451	116.22%	9, 13, 17
13	Le Tourmalet (Barèges-Mongie)	250	69	122	13'028'304	662'017	0%	13

14	Cauterets	117	26	136	7'027'387	348'153	0%	14
15	Piau Engaly	92	41	123	5'206'000	264'112	0.11%	9, 10, 13, 14
16	Luz Ardiden	127	26	123	3'357'540	223'824	41.01%	14, 20
17	Saint Lary Soulan	242	55	108	12'498'267	580'000	0%	17
18	Pierre St Martin	64	20	121	2'307'430	124'366	42.23%	9, 10, 14
19	Artouste	63	17	93	579'317	36'358	158.86%	9, 17, 20
20	Gourette	118	26	115	4'939'678	295'599	0%	20

Let us take the example of Porté-Puymorens resort (table 4). In order to achieve performance this resort must increase its output level (ski-lifts operator's turnover and total number of ski-passes sold) of around 77.25%. Table 4 shows that Porté-Puymorens may sell 136'798 ski-passes instead of 77'177. There is a gap of 59'621. This optimum corresponds to a "virtual" ski resort represents by a linear combination of real resorts (in this example these resorts are: Mijanes-Donzan, Monts d'Olmes and Cauterets) producing a greater quantity of outputs. These resorts represent the Porté-Puymorens' benchmarks in terms of strategic, organizational and managerial choices.

Table 4. Porte-Puymorens ski resort illustration

	Outputs		Inputs		
	Ski-lifts operator's turnover	Total number of ski-passes sold	Number of permanent employees	Total number of the ski area's opening days	Total number of slopes
Initial level	1290907	77'177	50	22	110
Optimum	2288170	136'798	50	18.7	106.8
Variation	77.25%	77.25%	0%	-15%	-2.9%

If results in table 4 point that no adjustments are necessary in terms of permanent employees, efficiency improvements are possible on the other inputs⁷. So, total number of slopes should be reduced by 15% and the number of ski area's opening days by 3%. Results highlight the inputs possible improvements which permit inefficient ski resorts to achieve optimal performance. These observations help managers to identify the performance drivers.

Performance drivers of Pyrenean ski resorts

This study has identified three drivers of Pyrenean ski resorts' performance.

The first one concerns the ski area in terms of infrastructure access (number of the ski area's opening days) and infrastructure capacity (slopes' kilometers, total number of slopes, ski-lift' number). The ski surface area is an importance factor in destination consumers' choice which explains connections between some ski areas (Val d'Isère-Tignes: Espace Killy in Savoy; Val Thorens, Méribel, Courchevel, etc.: 3 Vallées in Savoy; Pas de la Casa, Grau Roig, Soldeu etc.: Grandvalira area in Andorra). However, investments on ski surface area to continue to attract visitors are too expensive and need to be questioned. For example, les Angles (Pyrénées-Orientales) have invested in the « hands-free » liftpass system. Conversely, some ski resorts results show a ski surface area too vast in terms of ski slopes resulting to a loss of resources used (possibility to reduce employment). In this perspective, Porté-Puymorens can follow its reference set composed by Mijanes-Donzan and Mont-d'Olmes and reduce the number of slopes to optimize the ski surface area and achieve new organizational capabilities. Concerning the total number of the ski area's opening days, some ski resorts would open too early while others would close too late. Some ski resorts which want to improve their performance are encouraged to reduce their period of activity. In fact, ski resorts activity requires very important operational costs which increase with the number of opening days. Given this reference set, Porté-Puymorens could optimize its resources allocation in reducing this opening period. This is especially important for ski resorts located in Pyrénées-Orientales because of the substitute product of winter activities: the sea activities. Even if the reduction of the opening period permits to reduce costs, this is a short-term approach. Some ski resorts favour their communication and image: the first opening ski resort has more operational costs but benefits of a high return in terms of communication. Finally, expanded the opening period questioned the snow depth and the necessity to have adequate snow making equipments depending on geographical characteristics of the destination (elevation, massif, orientation...).

The second driver concerns the internal organization through the number of permanent employees. Some results show a important number of permanent employees in some ski resorts. This managerial driver is very complex because the human dimension is determinant for customers' satisfaction and impact local governance because of the different interests and goals (economic, social, political, collective, and individual).

After all, the third driver concerns the activities of diversification permitting to create "secondary" attractions (Botti *et al.*, 2006). Let us take the example of two ski resorts located in Haute-Savoie: Châtel and La Clusaz. These ski resorts at the same elevation, endow 130 kilometres of slopes, and about fifty ski-lifts. Even if the primary attraction seems to be the same, theses ski resorts differs with their secondary attractions. For example, while one proposed bob-luge slopes or ice diving activity; the other proposed an indoor swimming-pool. Moreover, some events can be used to differentiate ski resorts. For example, La Clusaz organized since 2006 "Full-Moon" ski soirées.

Conclusion

The unique infrastructure of French ski areas and the diversity of ski resorts make France one of the top three ski nations in the world. However, some ski resorts have had difficulties staying competitive confront to a decrease of skiers' number attending French resorts and the growing competition. This situation, therefore, creates a need for tourism competitiveness and highlights the importance for a performance evaluation.

This contribution proposes a benchmarking analyse in a representative sample of Pyrenean ski resorts to determine the physical surroundings drivers of ski resorts' performance.

This performance comparison of 20 Pyrenean ski resorts underlines a lack of efficiency for some of them. This study helps managers and decision-makers highlighting drivers in terms of resource allocation, management and organization. These drivers concern ski area, ski-lift operators' human resources, political attractiveness of the territory. Even if some factors like elevation or geographical orientation are difficult to control, it's possible to improve the management of the ski area. And, if ski area management requires investments to maintain a high offer level, it is interesting to question the relationship between resources used and results achieved to ensure an optimal level of performance.

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NOTES

1. A day ski-pass is a pass to use ski-lifts during one day while a season ski-pass permits to use ski-lifts during 25 days skiers. During the 2007-2008 season, more than 55 million ski-pass for a day were sold.
2. <http://www.domaines-skiables.fr/downloads/uploads/OBSERVATOIRERecueilIndicateur2011BD.pdf>, consulté le 25 Octobre 2011.
3. Xerfi (2010), Téléphériques et remontées mécaniques, Rapport Xerfi 700, février 2010 / CCH - NGA / PGA.

4. The DEA (*Data Envelopment Analysis*) method use permits to measure ski resorts performance. First, this method builds, with a linear program, and given the best practices, an efficient frontier. The efficient frontier is composed by the efficient ski resorts, the inefficient ski resorts are out of the frontier. This method permits to define a reference set (in terms of organizational and managerial skills or marketing practices) for each inefficient ski resort. Second, the distance between the frontier and the inefficient unit is measure and correspond to a score of technical efficiency. This score informs the ski resorts about possibilities of outputs improvements given the input levels used. For more details, see the two following books: Botti *et al.* (2008) and Briec & Peypoch (2010).
  5. Centre d'Analyse de l'Efficiency et de la Performance en Economie et Management of the University of Perpignan Via Domitia.
  6. The inputs and outputs' choice is carried out following the literature and data availability. The collected data come from "Domaines Skiabiles de France" (DSF).
  7. Although the orientation of the model is in output, variations on inputs appear. These variations arise from the technique used and mean that there may be potential gains on input levels.
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ABSTRACTS

Destinations in general and ski resorts in particular face an intense competition which questioned competitiveness and call for analysis in terms of relative performance. This study considers that ski resorts' competitiveness can be approach by ski-lift operators' performance since it's the primary attraction of the territory. Thus, ski resorts with comparable ski areas present in the same mountain, are in competition with each other. In this perspective, this paper proposes a comparative reading of Pyrenees ski resorts' performance. The objective is to highlight the "best" snow mountain destinations and propose three directions to improve inefficient destinations' practices. The first proposal is about ski area, the second one is about ski-lift operators' human resources and finally on the political attractiveness of the territory.

La forte concurrence que connaissent les destinations touristiques en général et les stations de sports d'hiver en particulier interpelle la compétitivité des destinations françaises et pousse aux analyses en termes de performance relative. Cette étude considère que la compétitivité des stations de sports d'hiver repose directement sur la performance de l'opérateur du domaine skiable puisque ce dernier constitue l'attraction primaire du territoire. Ainsi, les destinations d'un même massif, dotées d'un domaine skiable relativement identique, se retrouvent en situation de concurrence les unes envers les autres. Dans cette perspective, cette contribution propose une lecture comparative de la performance des stations de sports d'hiver pyrénéennes. Ceci permet de mettre en évidence les « meilleures » destinations neige du massif et de proposer trois leviers d'amélioration des pratiques des destinations inefficaces. Ces leviers portent d'une part sur le domaine skiable, d'autre part sur les ressources humaines de l'opérateur de remontées mécaniques et enfin sur la politique d'attractivité du territoire.

INDEX

Mots-clés: tourisme, destination, station de sports d'hiver, domaine skiable, compétitivité, performance, Pyrénées

Keywords: tourism, destination, ski resorts, ski area, competitiveness, performance, Pyrenees

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