The vulnerability of tourist destinations to air transport

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Do you think ...?

the consequences of air transport industry decisions on your destination and how these can ultimately impact the your tourism business model.
Measuring the vulnerability

Literature review
Methodology
Applicability
DASHBOARD

Vulnerability of a tourist destination in relation to air transport

System of simple indicators

Composite index
## System of indicators

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<th>Factors</th>
<th>Simple indicators</th>
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<td>V1</td>
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<td>Characteristics</td>
<td>V2</td>
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<td>Seasonality</td>
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<td>V8</td>
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<td>Commercialisation</td>
<td>V9</td>
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<td>V10</td>
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**Level of concentration:** Concentration of one element of the tourism system (market, season, airline and airport) has an impact on how sensitive a tourist destination will be towards changes in that element.

**Level of dependency:** where high dependence on a single element within a tourism system (transport, market, season, airline and airport) it gives that element a degree of power that limits the destination's ability to adapt.
The double reference point method for building Composite Indicator of Vulnerability
The procedure uses individual Achievement Functions (AF), defined for each indicator, to measure how far apart the values of each unit of analysis are from those established as the reference points.

In our case:

- **Reservation level** (maximum admissible value): The mean value between the average and the maximum value of the analysed destinations (discarding the outliers).
- **Aspiration level** (desirable value): The mean value between the average and the minimum value of the analysed destinations (discarding the outliers).
In our case:

**Equal Weight method**

Without previous experience or consensus about what factors make tourist destinations more or less vulnerable

However, it is likely that not all the factors affect the vulnerability of a destination to the same extent

What you think?

We need your opinion
According to your experience, how does the following factors make a tourist destination vulnerable?

(1 = weak / 5 = strong)

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- **Weight.** Importance of air transport in the tourist destination.
- **Markets.** Dependence of one or a few source markets.
- **Seasonality.** Concentration of tourism demand in one or a few months.
- **Commercialisation.** Dependence of one or a few airlines.
- **Accessibility.** Dependence of one or few airports to access the destination.
Normalisation  Weighting  Aggregation  Visualisation

WEAK index  MIXED index  STRONG index

Allows for compensation  The worst possible data
Advantages of the methodology

- Measure the *multidimensional aspect* of vulnerability
- Its *flexible system* provides an agile and practical tool adaptable to different realities
- Richness and breadth of analysis it allows
- Set of indicators based on *official sources of publicly available data*
- Easy to reproduce in any other tourist destination
- Easy-to-interpret result for managers of tourist destination
To offer easy-to-interpret results for the managers of the tourist destinations, who do not have to be experts in the subject in order to understand the findings.

**Simple indicators**
- Dependency: 0–100%
- Concentration: 0–1 Gini index
- The lower the indicator, the better

**Composite index**
- Strengths: (AF>1)
- Weaknesses: (AF<0)
- The lower the indicator, the worst

**Visualisation techniques**
- Colour scale
- Graphics: evolution, matrixs
- Offer an easy and intuitive visualisation of the results
Case study: Catalonia

1. Mixed composite index ($\lambda = 0.5$)
2. Individual Achievement Function (AF)
3. The vulnerability matrix
Catalonia | Evolution

Evolution of the mixed composite index of vulnerability (compensation coefficient $\lambda = 0.5$)
Catalonia | Strengths and weaknesses

**Strength** (Value above the aspirational level)

**Strength** (Value between the reserve and aspirational level)

**Weakness** (Value below the reserve value)

Individual Achievement Functions (AF)

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<tbody>
<tr>
<td>WEIGHT</td>
<td>V1 Importance of air transport to the tourist destination</td>
<td>1.161</td>
<td>1.149</td>
<td>1.140</td>
<td>1.115</td>
<td>1.031</td>
<td>0.976</td>
<td>0.979</td>
<td>1.015</td>
<td>1.051</td>
<td>0.987</td>
<td>0.994</td>
</tr>
<tr>
<td></td>
<td>V2 Level of concentration of tourist markets using air transport</td>
<td>1.043</td>
<td>1.056</td>
<td>1.057</td>
<td>1.063</td>
<td>1.065</td>
<td>1.067</td>
<td>1.151</td>
<td>1.157</td>
<td>1.164</td>
<td>1.160</td>
<td>1.164</td>
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<tr>
<td></td>
<td>V3 Key market (using air transport)</td>
<td>0.401</td>
<td>0.976</td>
<td>0.968</td>
<td>0.654</td>
<td>0.891</td>
<td>1.034</td>
<td>1.066</td>
<td>1.067</td>
<td>1.067</td>
<td>1.060</td>
<td>1.073</td>
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<tr>
<td>MARKETS</td>
<td>V4 Seasonal concentration of airport activity</td>
<td>0.246</td>
<td>0.335</td>
<td>0.280</td>
<td>0.270</td>
<td>0.293</td>
<td>0.099</td>
<td>0.103</td>
<td>0.080</td>
<td>0.111</td>
<td>0.205</td>
<td>0.140</td>
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<td></td>
<td>V5 Key month for airport activity</td>
<td>0.171</td>
<td>0.510</td>
<td>1.016</td>
<td>1.021</td>
<td>1.024</td>
<td>1.019</td>
<td>1.016</td>
<td>1.008</td>
<td>1.014</td>
<td>1.023</td>
<td>1.019</td>
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<tr>
<td>SEASONALITY</td>
<td>V6 Level of airline concentration</td>
<td>0.064</td>
<td>0.837</td>
<td>1.009</td>
<td>1.014</td>
<td>1.015</td>
<td>1.011</td>
<td>0.972</td>
<td>0.798</td>
<td>0.621</td>
<td>0.475</td>
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<tr>
<td>COMMERCIALISATION</td>
<td>V7 Key airline</td>
<td>0.293</td>
<td>0.713</td>
<td>0.480</td>
<td>0.527</td>
<td>0.788</td>
<td>0.095</td>
<td>-0.045</td>
<td>-0.071</td>
<td>-0.078</td>
<td>-0.073</td>
<td>-0.070</td>
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<tr>
<td></td>
<td>V8 Type of airline (lost cost versus flag carrier)</td>
<td>0.935</td>
<td>1.093</td>
<td>1.092</td>
<td>1.089</td>
<td>1.092</td>
<td>0.694</td>
<td>0.575</td>
<td>0.447</td>
<td>0.368</td>
<td>0.332</td>
<td>0.342</td>
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<tr>
<td>ACCESSIBILITY</td>
<td>V9 Level of airport concentration</td>
<td>0.613</td>
<td>0.795</td>
<td>0.968</td>
<td>0.779</td>
<td>0.525</td>
<td>0.468</td>
<td>0.516</td>
<td>0.423</td>
<td>0.335</td>
<td>0.323</td>
<td>0.340</td>
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<tr>
<td></td>
<td>V10 Key airport</td>
<td>-0.305</td>
<td>-0.237</td>
<td>-0.181</td>
<td>-0.239</td>
<td>-0.412</td>
<td>-0.463</td>
<td>-0.447</td>
<td>-0.531</td>
<td>-0.800</td>
<td>-0.820</td>
<td>-0.801</td>
</tr>
</tbody>
</table>
Catalonia | Positioning

**2009**

- **Strong index:** +
- **Weak index:** -

**DANGER ZONE**

- Weak index: -
- Strong index: -

**INTERMEDIATE ZONE**

- Weak index: +

**SAFE ZONE**

- Strong index: +

**2017**

- **Strong index:** -
- **Weak index:** +

**DANGER ZONE**

- Weak index: -
- Strong index: -

**INTERMEDIATE ZONE**

- Weak index: +

**SAFE ZONE**

- Strong index: +
Benefits: to take informed decisions

- An alert system to analyse the vulnerability
- Evaluate the performance of current policies and to identify possible areas of intervention
- Know their current situation and to simulate different vulnerability scenarios
- To support negotiations of contracts with airports and airlines
- Compare the evolution of a destination over time and with other destinations
- To prepare contingency plans to address potential risks
Research paper
Measuring the vulnerability of tourist destinations to the availability of air transport, using multi-criteria composite indexes

1. Introduction
Vulnerability refers to a state of being at risk of being harmed. The concept of vulnerability is context-dependent and the language used to define it varies across disciplines, although all disciplines have in common the tendency to change, a sensitivity or susceptibility towards such changes, a capacity to address such risks, and resilience to adapt to the change (Pineau, 2007; Swift, 2005). The tourism literature has defined vulnerability mainly in relation to single events or circumstances that disturb the destination’s (Gentile & Linnemark, 2015; Holbein, 2011; Pavlidou & Adamopoulou, 2011; Swift, 2005). Few studies consider multiple criteria of vulnerability, beyond economic and environmental impacts, and include factors such as tourism, and social (2011), which combine data on resilience from protected areas and local communities.

Destination management organizations (DMOs) need to equip themselves with data, and then act upon it, in order to reduce the vulnerability of their destinations, and to improve their competitiveness and sustainability (Poltrain & Gough, 2012). This paper aims to create a novel methodology through the use of computer software to determine the level of total vulnerability and the level of individual vulnerability, based on the data provided by the tourism industry. Vulnerability is defined as the level of tourism concentration and dependency towards key elements. In the present case, the air industry. The literature on destination vulnerability is related to the airline industry is first summarized. The paper then moves on to a detailed outline of the methodology, which is to make contributions, by determining the key measurement dimensions and then identifying associated indicators, that will be subsequently normalized, weighted and aggregated into a single indicator. The value of this methodology is next determined to the Spanish region of Catalonia. The paper then presents some conclusions and reflections on the political and management implications. Recommendations for future research are then made.

2. Literature review
Tourist destinations are vulnerable to decisions made by external stakeholders who do not share the same organizational objectives as those established by the destination managers and, therefore, may take commercial decisions that negatively affect the destination (Fyfe & Papanikos, 2015). A tourism destination authority can do well, financially, while at the same time being vulnerable. It is dependent on: (a) a single airport and/or a single airline operator, (b) tourist generating markets, and (c) weather variations (Kim, Holsper, Papanikos, Graham, & Anwari, 2015). In this, the tourism destination authority is vulnerable to weather that is outside its control. Vulnerability is defined here as being the result of two key concepts: (Pineau, 2007; Södergran, 2006) (a) concentration, where one element of the system (e.g., the market, season, airlines, airport) has an impact on how sensitive a tourist destination will be to changes in that element and (b)
Thanks!!

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