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Case study

Air-travelers’ concerns emerging from online comments during the COVID-19 outbreak

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ARTICLE INFO

Keywords: COVID-19
Coronavirus
Pandemic
Online comments
Air-travelers
Italy

ABSTRACT

This research aims to assess air travelers’ concerns affected by the Coronavirus pandemic, expressed in the comments they wrote online. A sample of 639 comments written on the Italian National Consumer Union website and related to the airline industry was assessed through an automated sentiment analysis in this study. The achieved results showed that travelers’ concerns were directed mainly towards compensations, cancellations, and COVID-19 and at the same time, they had mixed and unpredictable feelings. This element suggests that consumers may have understood that airline companies are facing unsustainable cash-flow and revenue situations. Moreover, all our hypotheses, grounded on existing literature, were refuted. Accordingly, we argue that the actual context prevents assessments based on previous assumptions, and studies related to the impact of COVID-19 need to be conducted anew.

1. Introduction

As a key element in the travel and tourism industry, air transport contributes largely to economic development (Moro et al., 2020). As the COVID-19 epidemic disease became a worldwide pandemic, the vital airline industry suddenly came to a halt. As a result, prospective air travelers, apprehensive with the absence of flights, started writing their concerns in online comments. This study aims to analyze such comments in order to unveil the relation between the evolution of the pandemic and travelers’ concerns.

During the first quarter of 2020, the disease had already caught the global attention of media, health organizations, and researchers, and the theme had been analyzed under multiple facets (e.g., Velavan & Meyer, 2020). Nonetheless, little is known about how related prospective customers perceived the virus outbreak’s impact on the airline industry. Indeed, the purpose of this investigation is to reduce such research gap through a sentiment analysis of online comments related to airline companies. Understanding customers’ point of view and how the main concerns evolved during the pandemic would help air carriers cope with the crisis more effectively and enrich their contingency plans.

In this study, an automated textual analysis was run on a sample of 639 comments related to the airline industry, written by consumers on the Italian National Consumer Union website. The source was chosen because Italy is among the countries most severely affected by the worldwide pandemic. Sentiment analysis was adopted to unveil affected travelers’ sentiments towards a set of relevant categories grounded on existing literature. While most previous studies adopted sentiment analysis for analyzing datasets composed by after-service reviews (e.g., Brochado et al., 2019; Calheiros et al., 2017), this research is innovative by focusing on the pre-service stage, where consumers are uncertain whether or not they will actually be able to travel.

The remainder of this paper is structured as follows: section 2 presents a literature review on the subjects relevant to this manuscript and proposes research hypotheses. Section 3 describes the dataset and methodology. Section 4 showcases the results and reviews their main implications. Finally, section 5 summarizes findings, addresses limitations, and proposes new paths for future research.

2. Literature review and research hypotheses

The sentiment analysis run on comments enables to determine their polarity (positive or negative) as well as the intensity of consumers’ perceptions (with zero being a neutral sentiment comment and a different numeric value reflecting that intensity for both polarities,

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https://doi.org/10.1016/j.tourman.2021.104313
Received 30 June 2020; Received in revised form 16 December 2020; Accepted 24 February 2021
Available online 27 February 2021
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negative and positive) (Pang & Lee, 2008). Therefore, sentiment analysis has been extensively applied within tourism and hospitality literature to understand tourists’ perceptions from online comments (Guerrero & Rita, 2020; Moro et al., 2019). After recognizing its importance and extensive development in existing literature, Tiwari et al. (2019) ran a sentiment analysis on a Twitter dataset related to the airline industry. They highlighted that passengers had negative comments regarding delayed and canceled flights, booking issues, and customer service. Indeed, as the increase of COVID-19 cases and consequent travel bans in Taiwan, pinpointed that out of three countries of origin that comprised the dataset (Hong Kong, US, and Japan), the number of tourists arriving from two of them (Hong Kong and the US) bounced back to the pre-SARS level right after the removal of the SARS alert in Taiwan.

As the confinement measures implemented to avoid healthcare systems from collapsing (Grasselli et al., 2020) resulted in turning the exponential increase of new cases into more controllable numbers (i.e., by reducing the number of new cases versus recoveries), it was more likely that prospective travelers became more positive toward the disease risk (Chen et al., 2020). Also, as Mao et al. (2010) confirmed in the SARS 2003 context, a reduction of infected cases led governmental authorities to analyze the removal of travel bans, which increased travelers’ predisposition to think about traveling again, mitigating the negative effect of the outbreak. Thus, we proposed that:

(H4) The decrease of new cases and fatalities leads to an increase in the sentiment score (i.e., more positive sentiment) towards the disease itself.

3. Methodology

The source of the online comments analyzed in the current research was the Unione Nazionale Consumatori (National Consumer Union) website (https://www.consumatori.it/bacheca-reclami/) (UNC, 2020a). Founded in 1955, the UNC is the oldest consumer association in Italy. The UNC is a member of the National Council of Consumers and Users (CNCU), set up within the Italian Ministry of Economic Development, and it is a social promotion association approved by the Italian Ministry of Labor and Social Policy. Moreover, the UNC is officially notified to the European Commission as a Consumer Association in Italy (UNC, 2020b).

The whole approach undertaken for the experiments is summarized in Fig. 1. All the experiments were conducted using the R statistical tool, which is an open-source software for data analysis supported by a broad community of contributors for packages to perform numerous tasks, including sentiment analysis.

Consumers can write comments about every issue they encounter with a product or a service with an entity on the National Consumer Union’s website. While submitting a comment, firstly, the macro category (e.g., Car Rental, E-Commerce, Tourism & Travel) closer to the issue (if none of the macro-categories work, there is a ‘generic’ one) which needs to be chosen and then the related company. When the company is not listed, there is the possibility of selecting an ‘other’ option. The consumers fill in a form with their written comments and can decide whether it is published online (making it publicly available) or not.

We only considered the ‘Tourism and Travel’ macro-category for our analysis. The related company’s list shows the following six sub-categories: ‘Alitalia,’ ‘Ryanair,’ ‘Trentitalia,’ ‘Italo,’ ‘Alpitour,’ and ‘other’ for tourism and travel. Between January 1 and April 30, 2020, 1671 comments were published under the ‘Tourism and Travel’ macro category. Out of them, all the comments that were classified under the sub-categories ‘Alitalia’ and ‘Ryanair’ (both airlines) were selected. Additionally, from the comments classified under the remaining sub-categories, those that were related to the airline industry were also selected.

Moreover, duplicates were removed, and also all comments which mentioned that the purchase was made through a third party (e.g., Travel Agency, Online Travel Agency) were excluded. Considering that the intermediary is the airline company’s direct customer instead of the final customer, consumers should address the third party for potential claims. This facet is aligned with our goal of understanding travelers’ perceptions about airlines and not towards travel agencies. Although affected by the pandemic too, these belong to a different segment and require a different study. The achieved result was a pruned set of 639 comments.

Most of the comments were written in Italian. Those were automatically translated into English using the Yandex translate API through
a specifically developed R script using the 'RYandexTranslate' package. The translation was validated with a random check of 5% of the comments by one of the authors whose native language is Italian and who writes fluently in English.

The approach detailed in Fig. 1 aimed at discovering and classifying sentences according to the consumer’s feelings in which (s)he denotes specific aspects deemed as important in existing literature (Table 1). It should be noted that the references highlighted in Table 1 are related to studies that analyzed the corresponding categories in the airline industry, which are the focus of our approach, regardless of the adopted methodologies or data sources. The approach is cyclic to allow incremental improvement of the underlying expressions that denote each category and that were not found in the previous iteration. First, a set of categories and related terms was developed based on existing literature. Then, the sentiment analysis algorithm detailed in Fig. 1 was executed. It consisted of searching if a sentence contained any of the expressions related to each category in every comment and every sentence in each comment. If a match was found, then the sentiment score was computed using the "sentimentr" package. The sentiment score is a numeric variable, with the two polarities denoting negative or positive sentiments, respectively. The absolute numeric value denotes the sentiment intensity (with zero meaning a neutral sentiment and higher absolute values implying stronger sentiments) (Pang & Lee, 2008). Such a procedure enabled capturing the sentiments perceived by prospective travelers about each category as the epidemic turned into a pandemic and spread globally and, specifically, to Italy during the analyzed period. The iterations through the cycle were needed since the common language used by travelers in online posts was not fully captured in the initial dictionary matching terms to each category. In each iteration, a small set of randomly selected comments was evaluated to assure if those contained any word that was not captured as belonging to a given category (e.g., ‘toll-number’ was not initially captured within the ‘Customer Service’ category; it was included later after the described tuning process). Consequently, the dictionary was enlarged to the version shown in Table 1, and the analysis was re-run in each new iteration of the cycle.

4. Results and discussions

Fig. 2 shows the main reasons that led customers to write comments
online. By assessing the volume of comments during the peak of the pandemic in Italy, it is possible to highlight that compensation and cancellation were the prevalent motives of concern.

The results of the sentiment analysis are presented through box-and-whiskers diagrams (also known as box plots). The x-axis represents the weeks in each figure, while the left y-axis and the right y-axis show the sentiment scores and the number of new and death COVID-19 cases reported in Italy, respectively (European Center for Disease and Control, 2020). The data is aggregated per week, and each box-and-whisker plot shows the weekly sentiment scores five summary-statistics (minimum, maximum, median, lower quartile, and upper quartile). We hypothesized there was a relation between the number of new cases and deaths in the country and each of the six categories defined in Table 1. To assess it, we adopted a linear regression model. However, as the number of comments mentioning each category was small (Fig. 2), we adopted the bootstrapping resampling method, which is considered a viable option to analyze moderate sample sizes (Shrout & Bolger, 2002). We adopted 5000 resampling processes, a number also adopted by Volgger and Pechlaner (2014), who highlighted that it is considered sufficient in existing statistics literature.

With the reduction of flights, one might expect a null score towards both 'on-time performance' of flights and issues related to boarding, since most commercial flights were not operating. Notwithstanding, it can be noticed from Fig. 3 that from the beginning of the outbreak in Italy (beginning of March), most of the expressed sentiments were negative toward 'on-time performance.' Only after April did the sentiment become neutral and even positive as the weekly new cases plummeted. Table 2 shows there is no support for a relation between cases/deaths and the sentiment score towards boarding issues as the COVID-19 numbers increased over the analyzed period. As for boarding issues, Fig. 4 highlights that there was an increase in the sentiment generated for boarding when the outbreak hit Italy exponentially hard. It can be hypothesized that this resulted from most flights to, from, and within Italy being grounded from March 10 onwards. Thus, as observed in Fig. 4, despite the pandemic striking hard since the end of February, the travel sector's media coverage and preannounced flight bans might have triggered a positive effect on travelers for actually being able to travel in that situation. Also, as more prospective travelers chose not to travel to avoid risk, the boarding procedure was likely swifter. The dispersion in

| Independent variables | Estimate | Std. Error | t-value | p-value |
|-----------------------|----------|------------|---------|---------|
| cases                 | -3.04E-05| 8.29E-05   | -0.3670 | 0.7172  |
| deaths                | 6.76E-04 | 6.05E-04   | 1.1170  | 0.2756  |

Model summary

| F-value | 1.8360 |
|---------|--------|
| Adjusted R² | 0.0627 |

Note: Bold p-values indicate that their corresponding variables are significant at p < 0.05.
the box plots shown after flights being grounded may also be justified because consumers write their comments whenever they want, which may happen after some time of the original situation (Stamolampros & Korfiatis, 2018).

Given the results discussed above, H1 can be assessed. Although flights were grounded in entire Italy since the second week of March, the trend regarding sentiments towards ‘on-time performance’ kept pace with the pandemic evolution, showing significant dispersion. While this contradicts the findings by Chinazzi et al. (2020), it should be noted that these authors analyzed the Chinese context, and before the disease was declared a pandemic by the World Health Organization (WHO). Also, they considered traffic flow and disease spread and not travelers’ perceptions. The results regarding boarding issues were also not consistently neutral (there is high dispersion regarding the generated sentiments – Table 3), as proposed in H1. Thus, H1 is not supported.

Contextually, following the reduction of the flying activities, a decrease in the sentiment score (more negative) towards cancellations and related compensations was expected, as well as towards the interaction with customer service. The sentiment analysis towards ‘cancellation’ showed how in Italy at the beginning of the outbreak, the feeling started to have a greater variation during each week than the previous periods when it was more consistent. Additionally, when the casualties started to rise, the average sentiment score towards cancellations was slightly negative and then remained neutral (Fig. 5). The considerable variation shows that consumers experienced very different feelings. The results suggest that few people canceled flights before the pandemic (and, subsequently, few reported them online). From the sentiment analysis, it can be noticed that the consumers’ perceptions of the topic ‘compensation’ present a large variation each week regardless of the pandemic. From the beginning of the outbreak until the end of the selected timeframe, the sentiment was averagely positive (Fig. 6).

Since, at these peculiar times, airline customer services are flooded with calls from customers needing assistance and long wait times are a consequence (The Wall Street Journal, 2020), we were presuming a negative sentiment score towards it. Unexpectedly, during the outbreak, the average sentiment scores were alternating negative, neutral, and positive positions with large weekly variations (Fig. 7). Zendesk, a CRM software company builder, while investigating the impacts of COVID-19 on customers’ experience, discovered that global customer satisfaction scores remained stable during the pandemic. More precisely, customer satisfaction only fell 3% towards airlines, suggesting that customers may be more forgiving during a crisis (Zendesk, 2020).

Unlike as hypothesized, the sentiment scores related to cancellations, compensations, and customer service showed heterogeneous perceptions among consumers. While the results in Tables 4–6 support the existence of a relation between COVID-19 numbers and sentiments towards cancelation/compensation/customer service, a rise in the number of cases has a negative influence, whereas a rise in deaths has a positive influence. It seems as if more deaths make customers more sympathetic towards impacted airline services. Thus, H2 is not supported. One can argue that the COVID-19 pandemic and its unprecedented impact generated mixed feelings in citizens in present times. Some travelers are also workers in small and medium enterprises (some are owners) and understand that airlines are currently facing enormous difficulties and may not be able to refund travelers at all. On the opposite side, if citizens are facing financial difficulties and see that airlines may never be able to recover fully, people will complain heavily and demand to be refunded.

In this unprecedented time, when airline companies are experiencing unsustainable cash-flow and revenue situations (European Commission, 2020), to preserve their liquidity, they are offering vouchers instead of refunds (Suau-Sanchez et al., 2020) for canceled flights. Vouchers would help ease the liquidity problems and could lead to better protection of passengers’ interests (European Commission, 2020). However, European regulation Nr. 261/2004 guarantees the right of the passengers to be refunded.

### Table 3

| Independent variables | Estimate  | Std. Error | t-value | p-value |
|-----------------------|-----------|------------|---------|---------|
| cases                 | 1.11E-04  | 4.75E-05   | 2.3330  | 0.0273  |
| deaths                | -9.27E-04 | 3.21E-04   | -2.8910 | 0.0075  |
| Model summary         |           |            |         |         |
| F-value               | 5.1350    |            |         | 0.0129  |
| Adjusted R²           | 0.2219    |            |         |         |

Note: Bold p-values indicate that their corresponding variables are significant at p < 0.05.
Table 4  
Regrouping model explaining 'Cancellation' sentiment score.  

|                | Estimate | Std. Error | t-value | p-value |
|----------------|----------|------------|---------|---------|
| **Independent variables** |          |            |         |         |
| cases          | -4.12E-05| 1.64E-05   | -2.5070 | 0.0126  |
| deaths         | 5.12E-04 | 1.09E-04   | 4.6630  | 0.0000  |
| **Model summary** |          |            |         |         |
| F-value        | 19.4000  |            |         | 0.0000  |
| Adjusted \(R^2\) | 0.0864   |            |         |         |

Note: **Bold** p-values indicate that their corresponding variables are significant at \(p < 0.05\).

Table 5  
Regrouping model explaining 'Compensation' sentiment score.  

|                | Estimate     | Std. Error  | t-value | p-value |
|----------------|--------------|-------------|---------|---------|
| **Independent variables** |          |            |         |         |
| cases          | -3.23E-05   | 1.22E-05   | -2.6440 | 0.0083  |
| deaths         | 2.87E-04    | 8.28E-05   | 3.4620  | 0.0006  |
| **Model summary** |          |            |         |         |
| F-value        | 6.9190      |            |         | 0.0101  |
| Adjusted \(R^2\) | 0.0133      |            |         |         |

Note: **Bold** p-values indicate that their corresponding variables are significant at \(p < 0.05\).

Table 6  
Regrouping model explaining 'Customer service' sentiment score.  

|                | Estimate | Std. Error | t-value | p-value |
|----------------|----------|------------|---------|---------|
| **Independent variables** |          |            |         |         |
| cases          | -9.72E-05| 2.92E-05   | -3.3270 | 0.0012  |
| deaths         | 7.19E-04 | 1.88E-04   | 3.8200  | 0.0002  |
| **Model summary** |          |            |         |         |
| F-value        | 7.3130   |            |         | 0.0010  |
| Adjusted \(R^2\) | 0.0911   |            |         |         |

Note: **Bold** p-values indicate that their corresponding variables are significant at \(p < 0.05\).

Considering that companies were initially omitting the refund option and according to Forbes (2020), some airlines have been accused of actively hiding the steps to get a cash refund, one can assume that the improper management of the cancellations and related compensations acted by the carriers (i.e., highly advertising vouchers as a form of compensation for the canceled flights rather than offering the refund option) caused incredible frustration (i.e., constant negative score related to compensations and cancellations) among prospective travelers. Furthermore, taking into account that the Employment Expectations Indicator plummeted to its lowest level on record in April 2020 (Directorate-General Financial and Economic Affairs of the European Commission, 2020), those passengers may have suffered the economic impact of the pandemic and have seen their income cut following the reduction of the economic activities (European Commission, 2020); indeed a monetary compensation would be much needed.

In addition to what has been previously pinpointed regarding the sentiment scores towards ‘compensation’ and ‘cancellation’ (Figs 4 and 5), Fig. 8 summarizes the trend of both themes showing that ‘cancellation’ was always perceived more negatively than ‘compensation,’ whereby the values were computed with the average of the sentiment scores emerged from the sentences containing the keywords. Moreover, both themes had a common behavior at different levels, suggesting that they were strictly interconnected. Lastly, even though the form of compensation presented was not the preferred one, sentiment toward compensation was averagely positive throughout the pandemic.

Given the results discussed above, H3 can be assessed. Despite the improper management of the cancellation adopted by carriers, sentiment scores towards ‘compensation’ were positive, and the ones related to the ‘cancellations’ were slightly negative when the casualties started to arise and then remained neutral. Additionally, in contrast to the findings of Liau and Tan (2014), where the cancellation is perceived as a negative issue, it should be noted that COVID-19 created an unprecedented environment where people have mixed and unpredictable feelings. Thus, H3 is not supported.

Although its first appearance in China occurred at the end of 2019, the current analysis pinpointed that COVID-19 was mentioned for the first time on the National Consumer Union website only at the beginning of February. Most likely, travelers whose destination was Asia were already concerned about the matter occurring at the destination. Later, at the beginning of the outbreak, as soon as the first cases were detected in Italy, the mention of the disease rose incredibly (Fig. 9). A similar pattern occurred with the diffusion of MERS in South Korea: according to Yongsu (2016), once the first case was registered, the number of related tweets increased and surged when the first death case was reported. As stated for MERS (Yongsu, 2016), it can be argued that the knowledge of the actual number of victims increased the feeling among travelers that COVID-19 could threaten their safety (consequently generating a negative score). Indeed, with the decrease of new cases, the
feeling towards the disease should be more positive.

The sentiment analysis (Fig. 10) shows that before the outbreak in Italy, the theme COVID-19 was firstly perceived positively and then neutrally with little dispersion, meaning that consumers had a similar consistent feeling towards it. Also, little was known about the matter at that time; travel bans were not in place, and the WHO had not yet declared it a pandemic. Later, during the outbreak, the sentiment alternated between slightly negative and neutral scores with large variations, showing again that people had mixed feelings. The only exception occurred at the end of March, when the lowest average score towards the disease and the smallest variations were detected, concurrently with the number of deaths reaching its peak. Moreover, with the number of cases decreasing, starting from a slightly negative position, the sentiment score first decreased (becoming more negative), and then returned to almost neutral.

Mao et al. (2010) taught us that a reduction of SARS infected cases removed, the number of incoming visitors from two out of three countries analyzed bounced back, showing that people were eager to travel and feared the disease less.

To conclude, unlike hypothesized, while the new cases were decreasing, the sentiment score was not increasing. The statistical results shown in Table 7 provide evidence of the absence of a relation between cases/deaths and the overall sentiment towards COVID-19 in the context of (non-)travel flights. Thus, H4 is not supported. However, it should be underlined that from its lowest average score at the end of March, with the number of cases dropping, the score improved while remaining negative, almost reaching a neutral status.

5. Conclusions

This research showcased how air-travelers’ concerns developed and changed during the COVID-19 pandemic through a sentiment analysis of online comments. The comments that composed the dataset in this study lay in a pre-service stage where consumers had not yet flown. Indeed, considering the likely impossibility to fly, travelers sought ‘compensation,’ which explains the highest frequency of that theme. Moreover, ‘cancellations’ and ‘COVID-19’ attracted much attention, and LCC were mentioned 1.67 times more than traditional airlines.

The COVID-19 pandemic and its unprecedented impact in present times definitely generated mixed feelings among travelers: sentiments towards delays and boarding issues kept pace with the pandemic evolution and showed significant dispersion, while the sentiments related to cancellations, compensations, and customer service displayed unpredictable behaviors. Moreover, it can be contended that cancellations and compensations are linked and showed similar patterns at different levels. Although the carriers initially improperly managed cancellations by highly advertising and offering vouchers instead of refunds, sentiment towards cancellation was slightly negative when the casualties started to arise and then remained neutral, while the one related to compensation was on average positive. Specifically in Italy, companies were not required to fully refund their customers immediately since an alternative issued voucher maintained the same monetary value. Additionally, the Italian government released a plan to nationalize Alitalia, the largest Italian airline, which might have calmed down concerned customers. This nationalization was a backup solution that many national governments have announced, with many already issuing refunding plans to major national companies such as Air France (in France), British Airways (in the UK), and Lufthansa (in Germany). We believe the national governments’ support of airlines during this troubled period was mandatory to enable the survival of existing airlines. This measure is vital for a quick resume of travel when the pandemic hopefully begins to be under control.

Several reasons may have led to the rejection of all four hypotheses. Based on existing literature, we assumed that delay issues would be nonexistent since air fleets were grounded. However, there were some negative comments regarding delays. Those may have been related to the numerous repatriation flights, which were especially scheduled to bring home travelers caught by the confinement rules suddenly applied worldwide (Pongpirul et al., 2020). Such travelers included both tourists and foreign workers who wished to return home. Some of the latter

| Independent variables | Estimate | Std. Error | t-value | p-value |
|-----------------------|----------|------------|---------|---------|
| cases                 | -1.65E-05| 1.59E-05   | -1.0420 | 0.2980  |
| deaths                | 9.64E-05 | 1.08E-04   | 0.8940  | 0.3720  |
| **Model summary**     |          |            |         |         |
| F-value               | 0.5506   |            |         | 0.5771  |
| Adjusted R²           | -0.0025  |            |         |         |

**Note:** Bold p-values indicate that their corresponding variables are significant at \( p < 0.05 \).
unexpectedly found themselves unemployed, while others were concerned with their families (Liao, 2020). Hence, a first recommendation stemming from such finding is the need for national contingency plans, that address unexpected crisis situations such as a pandemic, to repatriate nationals to their home countries, in association with national airlines. Despite the implementation of country-level lockdowns brought the pandemic numbers to lower levels and helped healthcare systems to be able to support increased demand, the situation was not sustainable in the long-term. Thus, as country-level lockdowns started to be lifted, a recommendation to the nation-level bodies that regulate the travel industry is to adopt different strategies to address tourists and traveling workers. For example, the former will not accept to be under quarantine due to the usually small duration of a vacation period of just a few days, while the latter may be willing to accept it. Thus, for tourists, additional COVID-19 tests may be required as an alternative to quarantine. As of December 2020, some nations (e.g., the UK) started to approve the first vaccines and huge logistic efforts are on the way to distribute them at an unprecedented worldwide scale. We can foresee that air traveling resume will require a certificate of vaccination instead of COVID-19 test or quarantine period. However, these are still crucial since vaccines will likely take a while before reaching the worldwide population.

In the face of our results, we can conclude that studies on the effects of COVID-19 in tourism may need to be developed anew. As highlighted by Kock et al. (2020), innovative tourism research remains low even in top-tier journals. Our study attempts to answer the challenge raised by Zenker and Kock (2020) to assess if existing knowledge is still valid under the ‘new normal’ driven by the coronavirus pandemic. Novel research unarguably needs to address this pertinent pressing issue. Notably, special issues are requesting submissions related to the impact of COVID-19 in tourism, and the top-tier Journal of Travel Research only accepts new submissions that assess such impact since pre-COVID-19 research may have become obsolete.

The analysis of online comments for research has limitations (Moro et al., 2019) that need to be mentioned. As with any secondary data source, data is limited to what is available. For example, it is not possible to assess if a consumer has some concerns about the airline’s difficulties to struggle with the pandemic or if (s)he is only concerned due to individual motivations. To deal with such limitations, we propose a primary data-based study using a specifically designed questionnaire to assess individual motivations versus understanding airline difficulties when expressing consumers’ concerns as future follow-up research. Such future research could also aim at analyzing guests’ expectations in the face of crises such as the COVID-19 pandemic.

Credit author statement

Stefania Piccinelli: Conceptualization, Methodology, Formal analysis, Writing – original draft. Sérgio Moro: Methodology, Formal analysis, Validation, Writing – review & editing. Paulo Rita: Writing – review & editing, Supervision.

Impact statement

This study provides evidence of unstable sentiments towards airlines as the COVID-19 pandemic spreads throughout the world and, particularly, Italy, one of the most severely affected countries. The mixed feelings by affected air travelers suggest they are understanding the unsustainable cash-flow and revenue situations of the airlines, but they can also imply that they are eager to travel again and already planning a future journey by accepting a voucher.

All the hypotheses formulated, grounded on existing literature, were not supported. Such result shows that the current pandemic context is unprecedented. Thus, assessment based on previous assumptions are not possible. Consequently, we can conclude that studies on the effects of COVID-19 need to be developed anew.

Declaration of competing interest

None.

Acknowledgments

The work by Sérgio Moro was supported by the Fundação para a Ciência e Tecnologia (PCT) within the following Projects: UIDB/04466/2020 and UIDP/04466/2020.

References

Abd-Alrazzaq, A., Albuwais, D., Househ, M., Hamdi, M., & Shah, Z. (2020). Top concerns of tourists during the COVID-19 pandemic: A forensivestudy. Journal of Medical Internet Research, 22(4), Article e19016.

Bhadra, D. (2009). You (expect to) get what you pay for: A system approach to delay, fare, and complaints. Transportation Research Part A: Policy and Practice, 43(9–10), 929-943.

Brochado, A., Rita, P., Oliveira, C., & Oliveira, F. (2019). Airline passengers’ perceptions of service quality: Themes in online reviews. International Journal of Contemporary Hospitality Management, 31(2), 855-872.

Calheiros, C., Moro, S., & Rita, P. (2017). Sentiment classification of consumer generated online reviews using topic modeling. Journal of Hospitality Marketing & Management, 16(7), 675-693.

Chen, H., Zhang, X., & Li, Z. (2020). A content analysis of Chinese news coverage on COVID-19 and tourism. Current Issues in Tourism. https://doi.org/10.1080/17441730.2020.1763269

Chinazzi, M., Davis, J. T., Ajelli, M., Gioannini, C., Litvinova, M., Merler, S., & Viboud, C. (2020). The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak. Science, 368(6489), 395–400.

Directorate-General Financial and Economic Affairs of the European Commission. (2020). Business and consumer survey results for April 2020. Accessed at: https://ec.europa.eu/info/sites/info/files/full_bcs_2020_04_en.pdf.

European Center for Disease and Control. Download today’s data on the geographic distribution of COVID-19 cases worldwide. Available at., May 17, 2020 https://www.ecdc.europa.eu/en/publications-data/download-today’s-data-geographic-distribution-covid-19-cases-worldwide.

European Commission. (2020). Commission Recommendation (EU) 2020/648 of 13 May 2020 on vouchers offered to passengers and travellers as an alternative to reimbursement for cancelled package travel and transport services in the context of the COVID-19 pandemic. Available at: Official Journal of European Union. June 13, 2020 http://data.europa.eu/eli/reco/2020/648/oj.

Gardner, E. S., Jr. (2004). Dimensional analysis of airline quality. Interfaces, 34(4), 272–279.

Grasselli, G., Pesenti, A., & Cecconi, M. (2020). Critical care utilization for the COVID-19 outbreak in Lombardy, Italy: Early experience and forecast during an emergency response. Journal of the American Medical Association, 328(16), 1545–1546.

Grippefett, C. I., & Erotokritou, C. (2020). EU regulation No 261/2004 on air passenger rights: The impact of the COVID-19 on flight cancellation and the concept of extraordinary circumstances. Air and Space Law, 45 (Special issue).

Guerreiro, J., & Rita, P. (2020). How to predict explicit recommendations in online reviews using text mining and sentiment analysis. Journal of Hospitality and Tourism Management, 43, 269–272.

Kock, F., Asnaf, A. G., & Tsonias, M. G. (2020). Developing courageous research ideas. Journal of Travel Research. https://doi.org/10.1177/0047287519900807

Liao, K. A. S. (2020). Operation ‘bring them home’: Learning from the large-scale repatriation of overseas Filipino workers in times of crisis. Asian Population Studies. https://doi.org/10.1080/17441730.2020.1811511

Liao, B. Y., & Tan, P. P. (2014). Gaining customer knowledge in low cost airlines through text mining. Industrial Management and Data Systems, 114(9), 1344–1359.

Mao, C. K., Ding, C. G., & Lee, H. Y. (2010). Post-SARS tourist arrival recovery patterns: An analysis based on a catastrophe theory. Tourism Management, 31(6), 855–861.

Moro, S., Lopes, R. J., Esmerado, J., & Botelho, M. (2020). Service quality in airport hotel chains through the lens of online reviewers. Journal of Retailing and Consumer Services, 56, 102193.

Moro, S., Rita, P., Esmerado, J., & Oliveira, C. (2019). Unfolding the drivers for sentiments generated by Airbnb experiences. International Journal of Culture, Tourism and Hospitality Management, 13(4), 430–442.

Pang, B., & Lee, L. (2008). Opinion mining and sentiment analysis. Foundations and Trends in Retrieval, 2(1), 1–135.

Pongpirul, K., Kewponwongpanya, K., Chotiratananit, K., & Therpugsu, S. (2020). Commercial airline protocol during COVID-19 pandemic: An experience of Thai Airways International. PloS One, 15(8), Article e0237299.

Ramsey, I. (2020). Consumer law and policy relating to change of circumstances due to the COVID-19 pandemic. Journal of Consumer Policy, 43, 437–450.

1 https://journals.sagepub.com/author-instructions/JTR.
Stamoulampros, P., & Korfiatis, N. (2018). Exploring the behavioral drivers of review valence. *International Journal of Contemporary Hospitality Management, 30*(10), 3083–3099.

Suau-Sánchez, P., Voltes-Dorta, A., & Cuguer-Escofet, N. (2020). An early assessment of the impact of COVID-19 on air transport: Just another crisis or the end of aviation as we know it? *Journal of Transport Geography*, https://doi.org/10.1016/j.jtrangeo.2020.102749.

Velavan, T. P., & Meyer, C. G. (2020). The COVID-19 epidemic. *International Journal of Contemporary Hospitality Management, 30*(3), 278–280.

Volgger, M., & Pechlaner, H. (2014). Requirements for destination management organizations in destination governance: Understanding DMO success. *Tourism Management, 41*, 64–75.

Yongsu, A. (2016). The impact of the MERS Outbreak in daily lives: Sentiment Analysis of Korean Tweets using time-series methods. Master thesis. Available at: university of north caroline Accessed on June 20th, 2020 [https://cdr.lib.unc.edu/concern/masters_papers/5999n700g](https://cdr.lib.unc.edu/concern/masters_papers/5999n700g).

Zendesk. (2020). Benchmark snapshot: Tracking the impacts of COVID-19 on CX. Available at: Accessed on June 15th, 2020 [https://www.zendesk.com/blog/ze ndesk-benchmark-snapshot-impact-covid-19-cx/](https://www.zendesk.com/blog/zendesk-benchmark-snapshot-impact-covid-19-cx/).

Zenker, S., & Kock, F. (2020). The coronavirus pandemic—A critical discussion of a tourism research agenda. *Tourism Management, 81*, 104164.