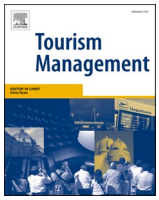
Tourism Management 88 (2022) 104396

Contents lists available at ScienceDirect

Tourism Management

journal homepage: www.elsevier.com/locate/tourman



A study of the tourism industry's cash-driven resilience capabilities for responding to the COVID-19 shock

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ARTICLE INFO

Keywords:
Cash holdings
Financial slack
Organizational resilience
COVID-19
Tourism industry

ABSTRACT

This study explores the tourism industry's cash-driven resilience capabilities. To map these capabilities, it enhances the existing analytical approaches to develop the two-dimensional evaluation of cash holdings of tourism businesses from four Central European Countries. The empirical investigation indicates that the non-resilient companies prevail over the resilient ones. If we consider the tourism industry sectors, cash-driven resilience capabilities differ statistically significantly at businesses size level but do not differ at the country level. It is observed that companies with greater cash-driven resilience capabilities are distinguished by a higher profitability and are less financially constrained. This study contributes to the ongoing debate on the COVID-19 impacts on the tourism industry by specifying the importance of financial slack and cash holdings in determining the resilience capabilities. In this respect, this study highlights the desired directions of system interventions and managerial concerns.

1. Introduction

Although the risks associated with a pandemic have remained in focus for risk management and insurance academia and practice in recent decades, the COVID-19 pandemic outbreak has resulted in unprecedented consequences (Broekhoven et al., 2006; Fan et al., 2018; Qiu, 2020; Verikios et al., 2016). Countries worldwide have taken drastic measures to stop the spread of the disease, including border closures, a ban on mass events, shutting down airports, imposing travel restrictions, and quarantines. The tourism industry is one of the most affected by COVID-19 due to severe disruptions in operating activity induced by customer loss (Hall, Scott & Gösslig 2020; UNWTO, 2020; Yang et al., 2020; Zenker & Kock, 2020).

Inevitably, customer loss leads to liquidity tensions and financial constraints, as businesses are left without the cash inflows from sales. Thus, this study addresses the importance of cash holdings in facing the impact of COVID-19 on tourism businesses' performance by exploring their cash-driven resilience capabilities (RC). To map these capabilities, this study enhances the existing analytical approaches to develop the two-dimensional evaluation of tourism businesses' cash holdings. The first dimension captures the existing cash holdings, while the second captures the dynamics of cash holdings over time, as a determinant of prior cash behavior.

The analytical approach applied in this study is derived from three concepts: organizational resilience, dynamic capabilities, and financial slack. Organizational resilience is commonly defined as the capacity to recover quickly from difficulties, with the emphasis on the ability to adapt after a disruption (a shock) has occurred (Bonss, 2016; Chowdhury et al., 2018; Linkov & Trump, 2019; McManus et al., 2008; Orchiston et al., 2016). The ability to recover, however, is determined by organization's dynamic capabilities. Dynamic capabilities are defined as the capacity of an organization to purposefully create, extent or modify its resources to explain how businesses can adapt to changing and turbulent environment (Barney & Hesterly, 2006; Eisenhardt & Martin, 2000; Helfat et al., 2007; Jiang et al., 2019; Mishra et al., 2019; Teece, 2007). In operational context, the availability of financial resources is crucial for the resistance and the ability to flexibly respond to any shock faced by the organization. In this regard, this work refers to the concept of financial slack, to feature the resilient and non-resilient organizations. Financial slack, also referred to as available slack, is defined as a stock of uncommitted resources, ready to be used and maintained in a form that allows immediate access (Daniel et al., 2004; Mishina et al., 2004; Natividad, 2013). Therefore, financial slack is commonly related to a buffer of cash and cash equivalents held by an organization (Bourgeois & Singh, 1983). Accordingly, this study assumes that higher cash-driven resilience capabilities are demonstrated by companies that hold cash resources and are able to source the buffer of cash resources over time.

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https://doi.org/10.1016/j.tourman.2021.104396
Received 16 April 2020; Received in revised form 8 June 2021; Accepted 20 July 2021
Available online 5 August 2021

In the empirical dimension, this study explores the prevalence of cash-resilient tourism businesses over the non-resilient ones, as well as the relationship between cash-driven RCs and tourism businesses' demographic characteristics (sector, size, and location). It also explores whether cash-driven RCs are associated with tourism businesses' performance by addressing their profitability and financial constraints.

Cash-driven RCs are explored in a sample of tourism businesses operating in four Central European countries: the Czech Republic, Hungary, Poland, and Slovakia. These countries share the experience of transforming from a centrally planned to a market economy and are regarded as similar in numerous aspects of their performance regarding economic development. To some extent, these countries are also relatively comparable if we consider the tourism industry perspective: they faced similar challenges in the development of a tourism industry (Hall, 2011) and currently are regarded as tourist destinations of equal recognition (Krzesiwo et al., 2018). From the macroeconomic perspective, these countries are also similar if we consider the contribution of the tourism sector to GDP (accounting for approximately 2–2.5% in recent years, as reported by World Bank (2020)) or the international spending on travel and tourism (of more than 50%, according to WTTC (2020)).

The Czech Republic, Hungary, Poland, and Slovakia took similar steps in response to the outbreak of the COVID-19 pandemic. In response to the first COVID-19 infections, these countries simultaneously closed their borders to control the flow of people and imposed social-distancing guidelines. In this regard, these countries' tourism industries faced comparable abruptness with respect to the loss of customers. This study examines a sample of 4728 firm-year observations in 2017–2019 to capture the cash-driven RCs. The study applies non-parametric methods to explore these RCs, as well as regression to explore the determinants of cash holdings in an organizational context.

This study responds to the calls for risk management and risk resilience related studies in tourism industry, recently addressed by Rosselló et al. (2020), Paraskevas and Quek (2019), and Ritchie and Jiang (2019). Although the consequences of disasters and other forms of crises have been previously studied in tourism-related literature, there is a virtual lack of studies focusing on financial vulnerability of tourism businesses in the event of pandemic outbreak.

The majority of prior works has reported the evidence of reduced tourist arrivals following major events (Rosselló et al., 2020). This stream of the literature indicates that the problem of loss of demand is a central issue for tourism industry. However, there is a research gap within the attempts to capture the potential severity of these consequences in financial terms and on aggregated level. In this respect, this study contributes to the existing academic debate by demonstrating the application of financial slack concept in the exploratory evaluation of cash-driven RCs of tourism industry as a whole.

According to Paraskevas and Quek (2019), in the works that address crisis management in tourism industry the 'crises-by-case' studies are prevalent, with the contribution to understand the crisis, rather than evaluating the preparedness. This paper fills in this gap, by demonstrating how the available financial slack (and cash resources) could serve in the estimation of resilience capabilities not only in the context of preparedness, but also in the context of the abilities to absorb and recover from the negative consequences of pandemic risk. In this respect, this paper fills in also the research gap identified by Ritchie and Jiang (2019), who have called for studies that aim at a better understanding of the organizational resilience and levels of organizational resilience, as well as the factors that influence the organizational resistance in tourism industry.

Finally, this study contributes by providing insight into cash holdings and cash management practices in the tourism industry. To this end, the literature that examines the cash holdings determinants is relatively extensive, but studies on public companies in the cross-sector dimension are more prevalent. There is a virtual lack of empirical studies that examine these practices in the tourism industry. Therefore, this study also contributes to financial literature, as it examines an under-researched sector with a large sample of non-listed firms.

The rest of this study is organized as follows. Section two outlines the theoretical foundations of this study by explaining: the complementarity of the concepts of organizational resilience, dynamic capabilities and financial slack, the unique features of COVID-19 pandemic as a risk, and the assumptions of the conceptual model of mapping cash-driven RCs in tourism industry. The third section exhibits the design of the research and methods. The fourth section discusses the results of empirical investigations. The fifth section concludes.

2. Conceptual framework of the study

2.1. Organizational resilience, dynamic capabilities and available financial slack

Resilience is commonly defined as the capacity to recover quickly from difficulties, with the emphasis on the ability to adapt after a disruption (a shock) has occurred (Bonss, 2016; Chowdhury, Prayag and Orchiston, 2018; Hall et al., 2018; Linkov & Trump, 2019; Lorenz & Dittmer, 2016; McManus et al., 2008; Orchiston et al., 2016; Prayag et al., 2018). In other words, a resilient system should distinguish with the ability to absorb, recover and adapt to known and unknown threats, with the aim to maintain the functioning of the structure (Linkov & Trump, 2019; NAS, 2012). As noted by Lorenz and Dittmer (2016), the concept of resilience has a merit when we consider the problem of disaster recovery and in this respect, there are various dimensions of resilience.

The majority of existing research is framed within the macro-perspective, by considering the resilience of economic systems or populations, with the prime aim of safeguarding the society. In this context, Linkov and Trump (2019) revise the Ebola disease control, as epidemic resilience. From micro-perspective, organizational resilience remains in focus, as a construct relevant for the field of entrepreneurship. The resilient organization shall design and implement effective actions to increase the probability of its own survival (Bonss, 2016; Hall et al., 2018; Mallak, 1998). Korber and McNaughton (2016), in their review of organizational resilience and entrepreneurship, concluded that there are two leading themes in resilience research. The first reflects the post-disruption view of resilience, by focusing on what happens after the disruption (e.g. Hayward et al., 2010). The second reflects the resilience as a dynamic process of adjustments (e.g. Dewald & Bowen, 2010). Similarly, Bonss (2016: 9) explains resilience as 'a philosophy as much as methodological practice that emphasizes the role of recovery post-disruption as much as absorption of a threat and its consequences'. In this respect, practitioners seek to optimize scarce resources (in this financial resources) to prepare their system against wide variety of threats.

The ability to recover and adapt facing the consequences of disruption, is consistent with the idea behind the concept of dynamic capabilities, which is the extension of resource based view (Mishra et al., 2019; Peteraf et al., 2013). Dynamic capabilities mean the capacity of organization to purposefully create, extent or modify its resources to explain how businesses can adapt to changing and turbulent environment (Barney & Hesterly, 2006; Eisenhardt & Martin, 2000; Helfat et al., 2007; Jiang et al., 2019; Mishra et al., 2019; Teece, 2007). It is impossible and often uneconomic for an organization to identify and prepare for all potential threats (Bromiley & Rau, 2016; Burisch & Wohlgemuth, 2016). The alternative is to build capabilities to sustain the unanticipated. In particular, these capabilities are related with the ability to transform the resources to recover and adapt (Bogodisov & Wohlgemuth, 2017). In this respect, the dynamic capabilities enrich the development of organizational resilience, to better manage the disruptions that have occurred.

In operational context, however, it is difficult to scale organizational resilience, and the existing proposals (e.g. resilience indices or resilience

matrices) are adjusted to a given type of shock (disastrous event), from a macro-perspective (Lorenz & Dittmer, 2016). Nevertheless, the organizational resilience (in micro-perspective) could be measured or scaled under the assumptions of the concept of organizational slack. Organizational slack is defined as a pool of available resources that are held in excess of organization's operational needs (Child, 1972; Cyert & March, 1963; Dimmick & Murray, 1978; Mishina et al., 2004; Nohria & Gulati, 1996; Zhong, 2011).

In the resilience context, organizational slack was defined by Bourgeouis (1981:30) as 'the cushion of actual or potential resources which allows an organization to adapt successfully to internal pressures for adjustment or to external pressures for change in policy'. This definition emphasizes the understanding of 'slack as a resource' and its two crucial functions: opportunity execution and the buffer against disruptions. In this regard, organizational theories perceive slack as a positive phenomenon, as it creates the ability to respond to any changes (e.g. Baker & Nelson, 2005; Mishina et al., 2004; Salancik & Pfeffer, 1978), in this absorb, recover and adapt, which is consistent with the concept of organizational resilience. However, the contradicting view of 'slack as inefficiency' points that slack is a costly item, as the idle resources are unemployed and there are managerial incentives to waste these resources, as suggested by assumptions of agency theory (Almeida et al., 2002; Galbraith, 1973; Jensen & Meckling, 1976; Phan & Hill, 1955; Zhong, 2001). This may explain why some companies are discouraged to hold organizational slack and keeps lively the discussion on optimal level of slack (Bromiley, 1991; Daniel et al., 2004; George, 2005; March & Shapira, 1987; Stan et al., 2014; Tan & Peng, 2003).

In the discussion of the buffering role of slack and the ability to measure the organizational slack, the 'easy to recovery' taxonomy proposed by Bourgeois and Singh (1983) has gained popularity. This taxonomy distinguishes between three types of slack: (a) available (b) recoverable and (c) potential, and the variables that allow to measure the slack are obtainable from accounting-based data (Bourgeois, 1981; Bourgeois & Singh, 1983). The available slack is represented by uncommitted resources, ready to be used and maintained in a form that allows immediate access. In other words, available slack is embodied in unabsorbed and high-discretionary resources and is associated with a buffer of cash and marketable securities, as cash equivalents, held by a company. Thus, available slack could be measured by the volume of cash and cash equivalents relative to total assets or, by ratios of liquidity or cash inflows-based ratios (Daniel et al., 2004). Recoverable slack is embodied in the absorbed resources that could be uncommitted, but it requires time and substantial redesign of organization performance. Thus, the recoverable slack is commonly measured by the ratios of efficiency and profitability, by the analysis of how far sales revenues are absorbed by the expenses (costs). Finally, the potential slack reflects the resources that could be obtained by the organization from its external environment. Accordingly, the potential slack could be captured by the ratios that refer to capital structure (e.g. leverage – debt to equity) or ability to cover debt obligations, as the hallmarks of the possible financial constraints (Wieczorek-Kosmala et al., 2018; Bourgeois, 1981; Daniel et al., 2004).

Undoubtedly, the concept of available slack is closely linked to the determinants of organizations' dynamic capabilities and the related organizational resilience. In the literature, available slack is commonly referred to as financial slack, associated with the cash holdings, that is the storage of company's liquid assets (Mishina et al., 2004; Natividad, 2013). Nevertheless, the remainder types of slack could also be analysed in terms of the availability of cash, as related to financial resources lagged in time (recoverable slack) or determined by the borrowing capacity (potential slack) (Wieczorek-Kosmala & Błach, 2019).

2.2. COVID-19 as a shock

Risk managers seemed to be well aware of the short and long term consequences of pandemic, both in the micro and the macro (in this global) perspective (Baumgart et al., 2007; Estrada et al., 2016; Woolnought & Kramer, 2007). Accordingly, in the works that refer to the management of risk in tourism industry, the pandemic risk was subject of empirical studies from a variety of perspectives (Ritchie & Jiang, 2019). These studies commonly refer to the observation that travel behavior and decisions are influenced by tourist risk perception, as tourists are likely to avoid destinations perceived as risky (Kozak et al., 2007).

The reduction of tourist arrivals following the major events was confirmed in numerous studies, examining the consequences of natural disasters (Bhati et al., 2016; Chowdhury et al., 2018; Huang & Min, 2002; Mazzocchi & Montini, 2001). With reference to influenza epidemic, the impact of infectious diseases in Asia (the 'bird flu' H5N1 and SARS) on international tourism was studied by Kuo, Tseng, Ju and Huang (2008), Mao et al. (2010), McAleer et al. (2010), and Rosselló et al. (2017). The consequences of the SARS outbreak in 2003 on international and regional tourism were also summarized in the review of risk-related studies in tourism industry, by Yang et al. (2017). The effects of various types of disasters (in this epidemic) on international tourism movements has been also very recently reported by Rosselló et al. (2020).

However, the impact of COVID-19 pandemic will undoubtedly result in more severe consequences, both on local and international scale. The global spread of the disease, has led to drastic measures taken by countries around the world, including border closures, ban on mass events, shutting down airports and imposing travel restrictions. From the perspective of tourism industry, these measures result in an unprecedented and catastrophic decline of demand. The impact of COVID-19 pandemic will be inevitably amplified by the nature of pandemic risk. Typically, the impact of a disastrous event is perceived through the combination of its likelihood (probability) and consequences (severity), see e.g. Aven (2016) or Oroian and Gheres (2012). However, Renn (2008) suggests the consideration of risk ubiquity (geographic dispersion of damage), risk persistence (temporal extension of potential damage) and reversibility (possibility of restoration after the damage). In this respect, probability of COVID-19 pandemic is indecisive, whereas the maximum extent of damage is high and can be estimated (in terms of the number of fatalities). However, it seems that COVID-19 pandemic distinguishes also with unpreceded ubiquity and undefined persistence. COVID-19 pandemic outbreak has also lead to severe disruptions in the performance of numerous businesses, leading to the awake of the symptoms of economic crises that are subject of increased governmental worries. In this respect, the reversibility of COVID-19 pandemic seems questionable.

For the tourism industry, the COVID-19 pandemic has caused a sudden decrease in (and a virtual lack of) customers. This is followed by the inability to generate sales revenues and the related operating cash inflows from a financial management standpoint. Simultaneously, the organization is faced with the need to cover the fixed costs (such as salaries or building maintenance). This mechanism is highlighted in the model of break-even-point analysis (Brigham & Daves, 2010; Fabozzi & Peterson, 2003). However, the loss of sales revenues and the related decline of cash inflows ultimately lead to liquidity tensions and financial constraints.

Fig. 1 illustrates a conceptual model of the consequences of the COVID-19 pandemic from the tourism industry perspective, framed within the concept of organizational resilience and incorporating the buffering function of available financial slack and related cash holdings. While performing in non-disturbed circumstances, the organization executes opportunities to prepare for any potential shocks that may emerge in the future. This is the period for developing dynamic capabilities by sourcing financial slack holdings and increasing cash resources.

The COVID-19 pandemic outbreak and the related system interventions are presented in Fig. 1 as the moment of disruption in the planned trajectory of performance. The sudden drop in performance

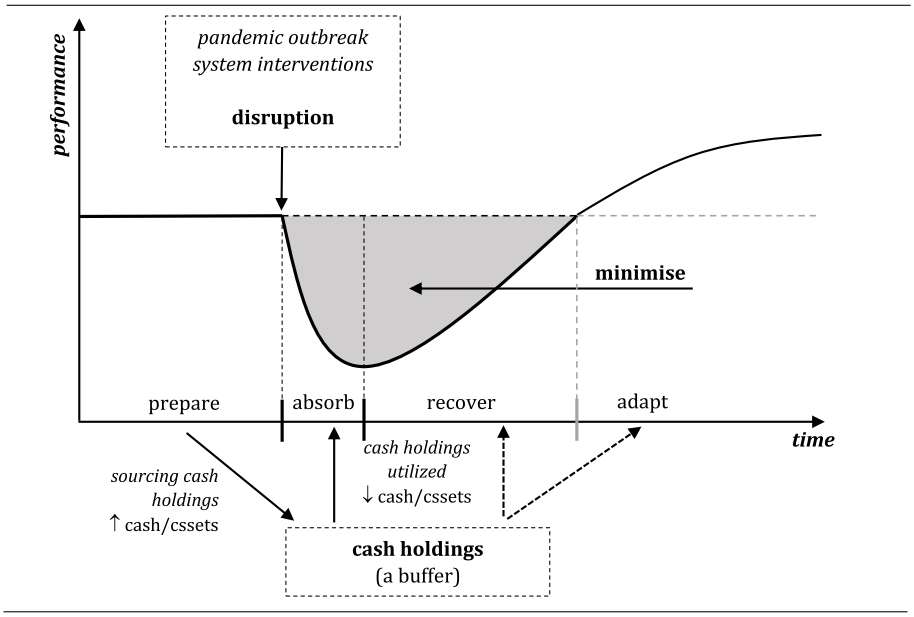


Fig. 1. The functions of cash holdings at the stages of resilience.

capabilities emerges in the phase of absorption. Further, after reaching the bottom of the negative impact of disruptions, the recovery stage begins. At the absorption and recovery stages, all measures and capabilities should focus on the minimization of the depth and duration of performance breakdown.

Financial slack performs a crucial buffering function at the absorption and recovery stages. The available cash holdings help counterbalance the loss of cash inflows in the aftermath of a customer's outflow. The higher the cash holdings, the larger the capacity to support the recovery stage, and possibly the adaptation stage. The conceptual model presented in Fig. 1 also highlights two critical aspects of cash holding behavior: accumulation (sourcing) and consumption.

2.3. Mapping cash-driven resilience capabilities in the tourism industry – a conceptual model

By combining the size and the dynamics of cash holdings (accumulation or consumption), we distinguish between four possible states of cash-driven resilience capabilities, as illustrated in Fig. 2. Therefore, Fig. 2 graphically explains the conceptual map of the evaluation of cash-driven RCs adopted in this study. The first state (square A) features organizations that could be regarded as cash-resilient. These organizations are distinguished by high levels of cash holdings and demonstrate dynamic capabilities in expanding cash resources. The second state (square B) also refers to cash holders, but the negative dynamics of cash holdings highlight the consumption of existing cash buffer. Thus, these

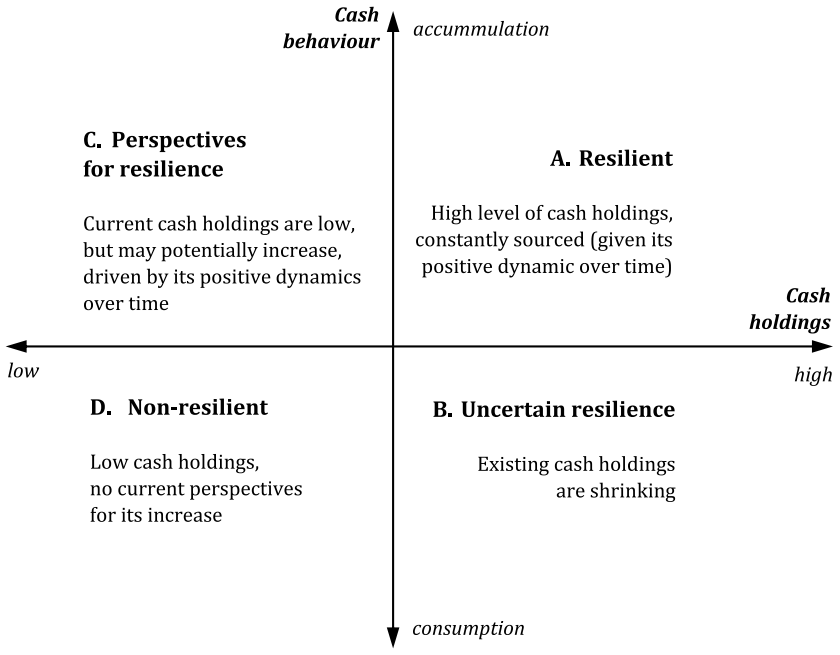


Fig. 2. Conceptual map of the evaluation of cash-driven resilience capabilities in tourism industry.

organizations are regarded as those with uncertain RCs. The third and fourth states (squares C and D) capture organizations that hold low (insufficient) cash holdings. If there is positive dynamics of cash holdings, the organization could be classified as having the perspectives for achieving the resilience capabilities (square C). However, if these organizations cannot increase their cash holdings, they are regarded as non-resilient (square D).

In the conceptual map of the four possible states of cash-driven RCs (Fig. 2), the distinction between organizations that demonstrate accumulation or consumption of financial slack holdings is attributed to positive or negative cash holdings dynamics. However, demarcating between slack holders and non-holders is not that straightforward and requires the establishment of thresholds of the minimum cash holdings requirements. Cash holdings are regarded as being industry sensitive (Berger & Offek, 1995; Subramaniam et al., 2011), since the branch determines cash holdings for operating and precautionary needs. In particular, companies that face a higher level of business risk and related cash flow volatilities tend to hold higher levels of cash (Acharya et al., 2007; Denis & Sibilkov, 2010; Harford et al., 2008; Haushalter et al., 2007; Steijvers & Niskansen, 2013). In practical terms, the industry benchmarks are regarded as good thresholds and are based on the mean values of cash holdings for companies operating in the given industry (e.g. George, 2005; Vanacker et al., 2013).

3. Research design and method

3.1. Development of research questions

From the tourism industry perspective, the major repercussions of the COVID-19 outbreak are the loss of customers and the related decline of operating cash inflows from sales. These consequences inevitably lead to the liquidity tensions and increase the bankruptcy threat. Thus, the capabilities of tourism businesses to resist the pandemic-driven difficulties are determined by their available financial slack holdings and the related cash holdings, as highlighted in the theoretical framework of this study. In this respect, the exploratory investigation was designed to provide insight on cash-driven RCs in the tourism industry, guided by several research questions.

Driven by the conceptual map illustrated in Fig. 2 The first problem addressed is the extent to which tourism businesses are distinguished by their cash-driven RCs relative to other possible states (non-resilient, uncertain resilience, or perspectives for resilience). Thus, the first research question is formulated as follows:

RQ1: Do cash-resilient businesses prevail over non-resilient ones?

Cash holdings are regarded as industry sensitive; thus, this study a priori revised the tourism industry's circumstances based on its sectors (tourism services and travel accommodation are divided). In addition, it addressed the organizations' size and location (country). The specifics of smaller businesses' performance increases their exposure to the negative consequences of a sudden decline in cash inflows (Eggers, 2020). As the countries differ with respect to the regulatory environment, the country-specific features may also influence the scale of cash holdings (Demir et al., 2019), thus determining the cash-driven RCs of the tourism industry. Therefore, in the design of the empirical investigation, the second research question is formulated as follows:

RQ2. Are the cash-driven resilience capabilities associated with tourism businesses' size and the country of operating performance?

Finally, this study examines a possible association between organizations' cash-driven RCs and their performance. Two critical aspects of company performance are considered. The first is profitability, which is sensitive to a decline in sales (due to customer loss) and an increase in operating costs. This aspect is motivated by the concept of recoverable slack. In general, better profitability indicates greater recoverable slack as these businesses can generate internal funds that could potentially source future cash holdings. The second critical aspect is the propensity to financial constraints which is determined by financial leverage and financial liquidity. This aspect is motivated by the concept of potential slack. Companies that demonstrate financial liquidity and low levels of financial leverage enjoy greater access to external funding that could support the evaporating cash holdings. Therefore, further research questions have been formulated as follows:

RQ3. Are resilient tourism businesses more profitable than non-resilient ones?

RQ4. Are resilient tourism businesses less financially constrained than non-resilient ones?

3.2. Variables

In Tables 1–3, we list and explain the variables examined in the empirical investigations. The first set (Table 1) explains the variables related to the evaluation of companies' cash-driven RCs. Following the developed conceptual model (Fig. 2), exploring tourism businesses' cash-driven RCs requires capturing cash holdings (Cash_H) and cash behavior (Cash_B). To explore cash holdings, we employ the cash ratio (C/A) consistent with prior literature (e.g., Han & Qiu, 2007; Kim et al., 2008; Vanacker et al., 2013). Prior literature indicates that cash holdings are industry sensitive (Berger & Offek, 1995; Subramaniam et al., 2011) and thus to demarcate between cash holders and non-holders, the benchmark of the C/A should be implemented as a threshold. Thus, following Bradley et al. (2011), we use the tourism sector means of the cash ratio to set the benchmarks. A company is consistently considered a cash holder if its C/A is above the sector mean and a cash non-holder otherwise. To explore cash holdings behavior (Cash_B), we employ the dynamics of cash ratio (ΔC/A). Positive dynamics identify cash accumulators, while negative dynamics identify cash consumers. The RCs are assigned according to the four possible combinations of cash holdings and cash behavior, as conceptually outlined in Fig. 2: resilient, uncertain resilience, perspectives for resilience, or non-resilient.

We construct the second set of variables as accounting-based financial measures, following prior literature (Bradley et al., 2011; Elsayed & Elshandidy, 2020; Lemmon et al., 2008; Rajan & Zingales, 1995; Welch, 2004). To capture the profitability-related aspect, we use three profitability ratios – return on assets (ROA), the productivity of assets (PA), and operating profit margin (OPM). To capture the financial constraints, we execute the set of ratios that are commonly used to evaluate the financial standing of a company relevant from the perspective of a debt: the current ratio of liquidity (LIQ) and debt-to-assets ratio as financial leverage (LEV). This set of variables is explained in Table 2.

The third set of variables explains the tourism businesses'

Table 1
List of the examined variables: constructs of cash-driven resilience capabilities.

Variable	Definition
C/A	Cash ratio, computed as cash and cash equivalents, relative to assets in total, as end-year obs.
ΔC/A	Dynamics of cash ratio (C/A), computed as the change of cash ratio between two consecutive years (e.g., ΔC/A for 2019 is the change of C/A between 2018 and 2019)
C/A(B)	Benchmark-adjusted cash ratio: $C/A - \bar{x}$, where $\bar{x}$ is the mean of C/A as the sector benchmark
Cash_H	Cash holdings, in two states; 1 – cash holders if $C/A(B) > 0$ 0 – cash non-holders if $C/A(B) \leq 0$
Cash_B	Cash holdings behavior, in two states: 1 – cash accumulation if $\Delta C/A > 0$ 0 – cash consumption if $\Delta C/A \leq 0$
RC	Resilience capabilities, in four states (consistent with Fig. 2; a combination of Cash_B and Cash_H): 1 – NR for non-resilient (cash non-holders, cash consumption) 2 – PR for perspectives for resilience (cash non-holders, cash accumulation) 3 – UN for uncertain resilience (cash holders, cash consumption) 4 – R for resilient (cash holders, cash accumulation)

Table 2
List of the examined variables: tourism businesses' performance.

Performance – profitability	
ROA	Return on assets, defined as operating profit (loss) to assets in total, as end-year obs.
OPM	Operating profit margin, defined as operating profit (loss) to sales revenues, as end-year obs.
PA	Productivity of assets, defined as sales revenues to assets in total, as end-year obs.
Performance – financial constraints	
LIQ	Current ratio of financial liquidity, defined as liquid (current) assets to current short-term debt, as end-year obs.
LEV	Debt-to-assets ratio (financial leverage), defined as long and short-term debt to assets in total, as end-year obs.

Table 3
List of the examined variables: tourism businesses' demographic characteristics.

Country	Country of operating performance CZ – Czech Republic HU – Hungary PL – Poland SK – Slovakia
Sector	Sector of operating performance: ACC Travel accommodation (NAICS 721) SERV Tourism services (NAICS 5615)
Size_EMPL	Business size, according to the number of employees MICRO (up to 9 employees) SMALL (10–49 employees) MEDIUM (50–249 employees) LARGE (250 employees or more)
Size_FIN	Business size according to the EU criteria on annual turnover (AT) and/or balance sheet in total (BS): MICRO (AT or BS up to 2 mln of EUR) SMALL (AT or BS between 2 and 10 mln of EUR) MEDIUM (AT between 10 and 50 mln of EUR or BS between 10 and 43 mln of EUR) LARGE (AT above 50 mln of EUR or BS above 43 mln of EUR)
Size_A	Business size, as the natural logarithm of total assets

demographic characteristics considered in this study (Table 3). The first characteristic is the businesses' location, as the country of operating performance. This exploratory study compares the pre-COVID-19 evidence from a group of Central European countries: the Czech Republic, Hungary, Poland, and Slovakia. The selected countries are considered as similar in terms of economic development due to their successful transition from a centrally planned to a market economy (Wyplocz, 2000). According to Krzesiwo et al. (2018), these countries enjoy the status of tourist destinations of comparable recognition, particularly for winter sports and mountain walking. A comparative focus on these countries is also justified by the simultaneity and similarity of the measures taken against the spread of COVID-19 infections. In response to the confirmation of the first infected (between 1 and March 6, 2020), Czech Republic, Hungary, Poland, and Slovakia relatively quickly (within the next ten days) decided to close their borders to stop the flow of potentially infected persons. In this regard, the tourism industry in the examined countries have faced a sudden customer loss on a comparable scale.

The second business characteristic considered in this study is the sector. Consistent with the NAICS codes classification, we distinguish between:

- Sector 1 – tourism services, following NAICS code 5615 that comprises travel arrangement and reservation services; this includes travel agencies, tour operators, and other travel arrangement and reservation services;
- Sector 2 – travel accommodation, following NAICS code 721, comprises businesses classified as traveler accommodation; this includes hotels, motels, and all other traveler accommodations.

The third business characteristic considered in this study is the size of the business. The main classification of companies by their size is consistent with the number of employees, and we apply the following categories of size: micro (of up to 9 employees), small (10–49 employees), medium (50–249 employees), and large (250 employees or more). However, according to European Commission guidelines (European Commission, 2016), we also supplemented the size classification by referring to the thresholds defined in terms of either annual turnover or annual balance sheet total. We also employ the natural logarithm of total assets as a common parametric measure of business size (Kumar et al., 1999).

3.3. Data and sample

This study employed data available in the EMIS business intelligence database (https://www.emis.com/), which provides information on companies operating in emerging markets. We extracted the business demographic data and accounting-based financial data relevant to the computation of the variables presented in Tables 1–3 for tourism businesses in the Czech Republic, Hungary, Poland, and Slovakia.

In the empirical investigation, we consider companies that were actively performing in 2019, and under this criterion we initially obtained data for 4396 tourism businesses. We verified the initial criterion of functional performance in 2019 by removing the observations with no or missing sales revenues for 2019. Following this, we obtained the entry dataset for 2688 companies, which provided 10,752 firm-year observations. Further, we removed all biased observations (e.g., lack of the balance between assets and liabilities or missing the variables relevant to this study) and obtained a sample of 6671 firm-year observations. Next, we removed all observations in the dataset with missing C/A dynamics records. Data for 2016 were obtained to compute the dynamics of C/A between 2016 and 2017 and, by this, to define the Cash_B for 2017; thus, the firm-year observations for 2016 were also removed from the final sample. We obtained the complete set of entry variables for 2017–2019, with 4728 firm-year observations. The sample composition scheme is presented in Table 4. Table 5 presents the sample structure with reference to the business demographic characteristics relevant for this study.

Table 4
Sample composition scheme.

Sample composition		CZ	HU	PL	SLO	In total
Entry dataset: number of tourism businesses in 2016–2019		786	850	2400	360	4396
of which firms of confirmed active performance in 2019 (availability of data on sales revenues in 2019 revised)		140	663	1604	281	2688
Number of entry sets of firm-year observations		560	2652	6416	1124	10,752
Less biased firm-year observations		179	268	3512	122	4081
Initial free of bias		**381**	**2384**	**2904**	**1002**	**6671**
sample (firm-year observations):	2019	117	607	750	247	1721
	2018	125	604	778	254	1761
	2017	92	593	809	255	1749
of which:	2016	47	580	567	246	1440
Less firm-year observations without dynamics of cash ratio (inability to compute – predominantly for newly launched businesses mainly)		78	14	407	4	503
Less firm-year observations in 2016		47	580	567	246	1440
FINAL SAMPLE		**256**	**1790**	**1930**	**752**	**4728**
of which:	2019	117	606	750	247	1720
	2018	96	598	642	253	1589
	2017	43	586	538	252	1419
of which:	travel accommodation	181	1040	1392	502	3115
	tourism services	75	750	538	250	1613

Table 5
Sample business demographic characteristics.

		In total	Sector			
			ACC		SERV	
		N	N	%	N	%
Country	CZ	256	181	5.81	75	4.65
	HU	1790	1040	33.39	750	46.50
	PL	1930	1392	44.69	538	33.35
	SK	752	502	16.12	250	15.50
	In total	**4728**	**3115**	**100**	**1613**	**100**
Size_EMPL[a]	micro	1323	538	20.30	785	57.38
	small	1244	933	35.21	311	22.73
	medium	918	716	27.02	202	14.77
	large	533	463	17.47	70	5.12
	In total	**4018**	**2650**	**100**	**1368**	**100**
Size_FIN	micro	2314	1873	60.13	441	27.34
	small	1000	710	22.79	290	17.98
	medium	582	431	13.84	151	9.36
	large	832	101	3.24	731	45.32
	In total	**4728**	**3115**	**100**	**1613**	**100**

Notes: [a)] the employment information was missing for 710 firm-year observations.

3.4. Methods

At the first stage of the exploration of cash-driven RCs, we employ non-parametric ANOVA (Kruskal-Wallis test) to verify whether businesses of different sizes or locations differ significantly with respect to the levels of RCs and their constructs (cash holdings and cash behavior). Further, we employ non-parametric ANOVA to verify whether the businesses of various RC states differ significantly in terms of profitability and financial constraints.

As the cash holdings remain a critical variable in capturing the cash-driven RCs, we also perform a weighted-last-square (WLS) regression to explore the determinants of the cash holdings in the tourism industry. In this endeavor, we methodically follow prior studies on cash holdings determinants (Ahmad & Adagoulu 2018; Kim et al., 2011; Ozkan & Ozkan, 2004).

4. Results and discussion

4.1. Exploration of cash-driven resilience capabilities (RQ 1)

We have confirmed statistically significant differences in the C/A between the sectors (travel accommodation and tourism services, U Mann-Whitney test $p < 0.000$). This is consistent with prior findings that the C/A is sector-sensitive (Berger & Offek, 1995; Subramaniam et al., 2011). Therefore, in each aspect of further explorations, we control the results for the tourism industry as a whole and at a sector level (travel accommodation and tourism services are divided). Where applicable, we apply the sector benchmark-adjusted cash ratio (C/A(B)).

Overall, the cash holdings in travel accommodation are, on average, visibly lower than those in tourism services, as confirmed by the C/A mean values of 14.15% and 36.01%, respectively (Table 6). In both sectors, however, we observe a slight increase of C/A over time, and the variability of C/A is visibly higher in tourism services. Data on mean values of dynamics of cash holdings (ΔC/A) provided in Table 7 confirm this observation. In recent years in both sectors, the dynamics ratios are positive (with the exception of 2017/2016 in tourism services).

In Figs. 3 and 4, we graphically visualize the dispersion plots of the two ratios critical for mapping cash-driven RCs, that is, C/A and ΔC/A, on firm-year observation levels (congruent with our theoretical frame provided in Fig. 2). In both sectors, nearly one-third of the observations fall into the non-resilient cluster: in travel accommodation, 32% of observations are captured as non-resilient, and 30.4% in tourism services. However, a percentage of the observations captured in the resilient cluster was higher for tourism services (28.4%) than travel accommodation (20.6%). Nevertheless, in both sectors, more than half of the observations are captured in the non-resilient clusters or with perspectives for resilience, which confirms the prevalence of cash non-holders (69% in travel accommodation, 55.4% in tourism services). This indicates that businesses operating in the tourism industry (in accommodation in particular) do not hold cash reserves that could be used to counterbalance the immediate lack of cash inflows from sales.

We additionally verified the pre-COVID-19 period by examining the situation in 2019, in comparison to prior years (Fig. 5). In travel accommodation, the percentage of businesses captured as cash-resilient in 2019 was visibly higher than in 2018 and 2017. In tourism services, this percentage is relatively comparable over time. Data in Fig. 5 also confirm that the percentage of businesses that fall into the non-resilient cluster is constantly declining.

In light of evidence that non-resilient businesses exceed the number of resilient ones, the tourism businesses' cash-driven RCs are of low level (RQ1). However, the situation improved marginally in 2019 as the immediate pre-COVID-19 period. In both sectors, the percentage of cash non-holders is higher than that of cash holders. Given that the ability to accumulate cash holdings over time is determined by the dynamics of cash holdings (ΔC/A), the combined impact of cash holdings and cash behavior indicate the low ability of the tourism industry to withstand financial disruptions caused by the COVID-19 pandemic.

4.2. Cash-driven resilience capabilities and tourism businesses demographics (RQ 2)

We applied the non-parametric ANOVA (Kruskal-Wallis test) to verify whether the tourism businesses differ with cash-driven RCs across the countries and size. Table 8 provides the p-values of the Kruskal-Wallis test for the tourism industry as a whole and divided by the sectors. The table provides the results obtained for the cash-driven RCs and their constructs (sector-adjusted cash holdings C/A(B) and cash behavior as ΔC/A).

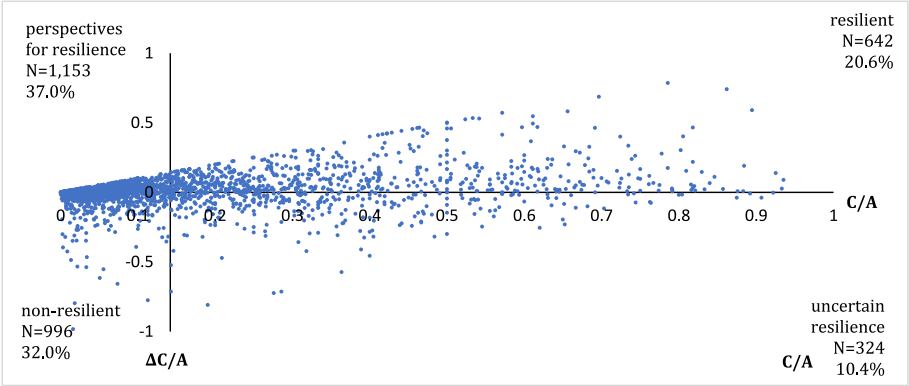
The data confirm that there are no statistically significant differences at the country-level if we consider the sectors. However, the businesses that perform in particular countries differ significantly with their resilience capabilities for the whole tourism industry. Given the results of pair-wise comparisons and mean ranks of the K-W test (presented in Annex, Table A1), there are statistically significant differences between Slovakia and Hungary. The resilience capabilities are the highest for the Czech Republic. Data in Table 8 indicates that there are also statistically

Table 6
Descriptive statistics for C/A ratio (cash holdings) in the examined sample.

	C/A for ACC				C/A for SERV			
	In total	2017	2018	2019	In total	2017	2018	2019
N	3115	928	1062	1125	1613	491	527	595
Mean	0.1418	0.1332	0.1361	0.1545	0.3601	0.3501	0.3597	0.3688
St.Dev	0.1813	0.1745	0.1748	0.1919	0.2584	0.2482	0.2614	0.2642
Variance	0.0329	0.0305	0.0306	0.0368	0.0668	0.0616	0.0683	0.0698
Min	0.0002	0.0004	0.0002	0.0004	0.0008	0.0028	0.0008	0.0034
Max	0.9355	0.9070	0.9254	0.9355	1.0000	1.0000	1.0000	1.0000

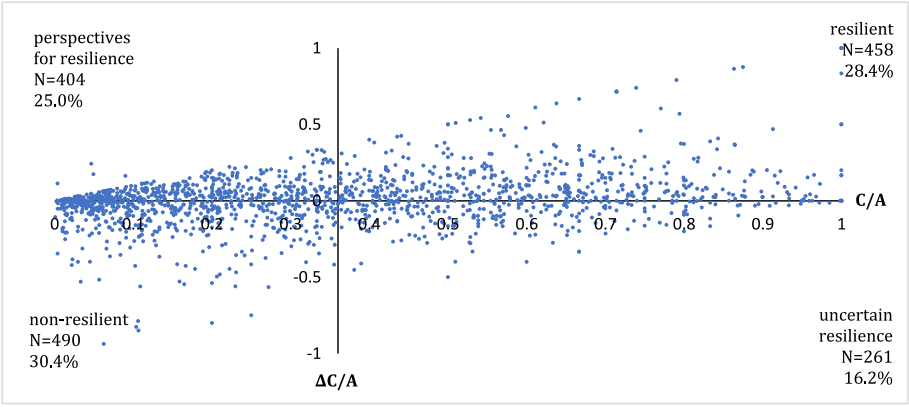
Table 7
Descriptive statistics for ΔC/A (dynamics of cash holdings) in the examined sample.

	ΔC/A for ACC				ΔC/A for SERV			
	in total	2017/2016	2018/2017	2019/2018	in total	2017/2016	2018/2017	2019/2018
N	3115	928	1062	1125	1613	491	527	595
Mean	0.0081	0.0049	0.0043	0.0145	0.0089	−0.0006	0.0140	0.0123
St.Dev	0.1104	0.1061	0.1051	0.1181	0.2147	0.1707	0.1642	0.2776
Variance	0.0122	0.0113	0.0111	0.0140	0.0461	0.0291	0.0270	0.0770
Min	−0.9839	−0.8095	−0.7760	−0.9839	−5.0435	−0.8499	−0.5391	−5.0435
Max	0.7857	0.5714	0.5000	0.7857	1.0000	0.7391	0.8636	1.0000



Notes: The X-axis cut-off point is the sector mean of C/A (0.1418)

Fig. 3. Dispersion of cash-driven resilience capabilities: travel accommodation (N = 3115). Notes: The X-axis cut-off point is the sector mean of C/A (0.1418).



Notes: The X-axis cut-off point is the sector mean of C/A (0.3601)

Fig. 4. Dispersion of cash-driven resilience capabilities: tourism services (N = 1613). Notes: The X-axis cut-off point is the sector mean of C/A (0.3601).

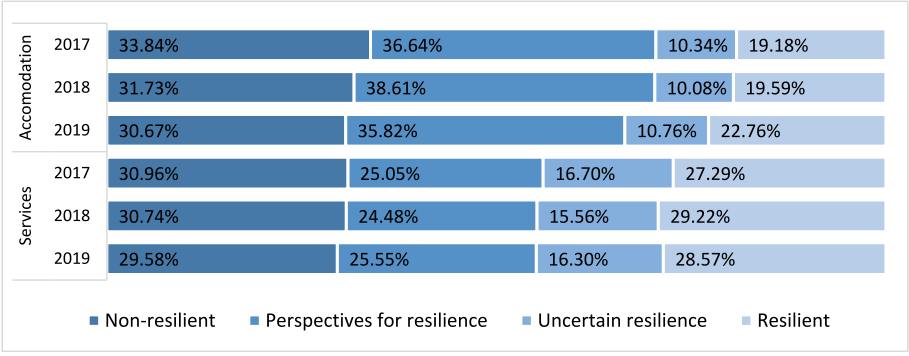


Fig. 5. The structure of cash-driven resilience capabilities in the tourism industry over time.

Table 8
Results of Kruskal-Wallis test for cash-driven resilience capabilities and tourism businesses' demographic characteristics.

K-W p-values for resilience capabilities (RC) and:	Tourism industry			ACC			SERV		
	C/A(B)	ΔC/A	RC	C/A(B)	ΔC/A	RC	C/A(B)	ΔC/A	RC
Country	.000***	.562	.001**	.000***	.405	.054	.032*	.686	.066
SK-PL	1.000		1.000	.759			1.000		
SK-HU	.031*		.006**	.003**			.265		
SK-CZ	.001**		.059	.000***			1.000		
PL-HU	.014*		.209	.041*			.060		
PL-CZ	.001**		.189	.000**			1.000		
HU-CZ	.145		1.000	.032*			1.000		
Size_EMPL	.024*	.181	.000***	.117	.662	.629	.000***	.402	.007**
large-medium	1.000		1.000				.453		1.000
large-small	1.000		1.000				.256		.214
large-micro	.723		.025*				.001**		.023*
medium-micro	.019*		.000***				.035*		.140
medium-small	1.000		.764				1.000		1.000
micro-small	.297		.038*				.021*		1.000
Size_FIN	.000***	0.123	.000***	.000***	.174	.000***	.001**	.423	.021*
large-medium	.000***		.000***	1.000		1.000	.234		.142
large-small	1.000		1.000	.000***		.000***	.112		.486
large-micro	.010*		.038*	.179		.094	.571		1.000
medium-micro	.084		.000***	.000***		.000***	.015*		.061
medium-small	.000***		.000***	.000***		.000***	1.000		1.000
micro-small	.095		.029*	.000***		.000***	.003**		.199

Notes: Statistically significant at: ***α = 0.001; **α = 0.01; *α = 0.05.

significant differences between the countries if we consider the cash holdings (but not cash behavior). Based on this, we may conclude that the country-specific features could be influential on RC, as the country-related settings are influential on the size of cash holdings.

The analysis confirms that there are statistically significant differences in cash-driven RCs for the tourism industry as a whole, as well as in the considered sectors at the businesses-size level. This evidence is apparent if we consider the size determined by the number of employees (size_EMPL, except from the accommodation sector) and the scale of performance (given the business's sales revenues and volume of assets, size_FIN). Notably, the results of pair-wise comparisons (Table 8) and mean ranks of the Kruskal-Wallis test (Annex, Table A1) do not reveal the unified pattern of the differences in cash-driven RCs of businesses of different sizes. For instance, with respect to travel accommodation statistically significant differences were not observed between medium-large and medium-small firms (size_FIN). Moreover, the means of Kruskal-Wallis test ranks indicate greater cash-driven RCs in small and micro firms, as compared to large and medium ones. However, with respect to tourism services, micro and larger firms are distinguished by higher ranks for cash-driven RCs than small and medium firms. The mean ranks of Kruskal-Wallis test for size determined by employment (size_EMPL) indicate that with respect to accommodation, the lowest cash-driven RCs are observed in medium firms (although the differences are not statistically significant), whereas in services–in large firms. Overall, consistent with country-level results, there are statistically significant differences for cash holdings but not for cash behavior. Therefore, we may conclude that size influences cash-driven RCs, as it determines the level of cash holdings. However, size is inconclusive if we consider the link between tourism businesses' size and the state of RCs.

4.3. Cash-driven resilience capabilities and tourism businesses' performance (RQ3 and RQ4)

Further analysis was directed toward examining whether businesses assigned to a given state of cash-driven RCs differ with the level of profitability (RQ3) or financial constraints (RQ4). The results of the non-parametric ANOVA (K-W test) outlined in Table 9 signalize that the resilient firms differ significantly with respect to their profitability from the non-resilient ones (with the exception of productivity of assets (PA) in tourism services, in pair-wise comparisons). A more-in-depth study of the mean ranks of the K-W test (see Annex, Table A2) indicates that businesses captured as being cash-resilient or of uncertain resilience (which means the cash-holders) are distinguished by higher levels of profitability. Only in the case of operating profit margin (OPM) in travel accommodation (ACC), the ranks are higher for resilience and perspectives of resilience, which suggests that the businesses of higher operating profit margin can accumulate cash to strengthen their resilience capabilities. Overall, the non-parametric ANOVA results indicate that the worsening of sales-costs and sales-assets relationships may negatively influence cash-driven RCs of tourism businesses, as they remain significantly connected with the ability to hold high cash reserves and accumulate cash over time.

Data presented in Table 10 indicates that cash-resilient businesses differ significantly from non-resilient ones and those of perspectives for

Table 9
Results of Kruskal-Wallis test for the states cash-driven resilience capabilities (RC) and profitability.

p-values of:	Tourism industry			ACC			SERV		
	ROA	PA	OPM	ROA	PA	OPM	ROA	PA	OPM
K-W test	.000***	.000***	.000***	.000***	.000***	.000***	.000***	.003**	.000***
Post-hoc tests:									
R-NR	.000***	.000***	.000***	.000***	.000***	.004**	.000***	.325	.000***
R-PR	.000***	.000***	1.000	.000***	.000***	1.000	.000***	.001**	.002**
R-UR	.007**	.253	.000***	.000	.029*	.000***	1.000	.776	1.000
NR-UR	.000***	.000***	1.000	.000***	.000***	.009**	.000***	1.000	.000***
NR-PR	1.000	.000***	.000***	1.000	.053	.000***	1.000	.292	.300
PR-UN	.000***	.000***	.000***	.000***	.000***	.000***	.000***	.467	.001**

Notes: Statistically significant at ***α = 0.001; **α = 0.01; *α = 0.05; R – resilient, UR – uncertain resilience, PR – perspectives for resilience, NR – non-resilient; Post-hoc tests indicate significant differences between the pairs of cash-driven resilience states (pair-wise comparisons).

Table 10
Results of the Kruskal-Wallis test for resilience states and financial constraints.

p-values of:	Tourism industry		ACC		SERV	
	LIQ	LEV	LIQ	LEV	LIQ	LEV
K-W test	.000***	.000***	.000***	.000***	.000***	.000***
Post-hoc tests						
R-NR	.000***	.000***	.000***	.000***	.000***	.000***
R-PR	.000***	.000***	.000***	.000***	.000***	.000***
R-UR	1.000	1.000	.623	.082	.788	.362
NR-UR	.000***	.001**	.000***	1.000	.000***	.000***
NR-PR	.622	1.000	1.000	1.000	1.000	1.000
PR-UN	.000***	.002**	.000***	1.000	.000***	.000***

Notes: Statistically significant at ***α = 0.001; **α = 0.01; R – resilient, UR – uncertain resilience, PR – perspectives for resilience, NR – non-resilient; Post-hoc tests indicate significant differences between the pairs of cash-driven resilience states (pair-wise comparisons).

resilience differ with the levels of liquidity and financial leverage. The ANOVA mean ranks (see Annex, Table A3) show that the tourism businesses with higher liquidity levels are captured as the resilient ones or as those of uncertain resilience. It confirms that higher cash holdings are observed in businesses with better liquidity positions and lower financial constraints. This observation is confirmed for the tourism sector as a whole and for travel accommodation and tourism services. The mean ranks of the K-W test indicate that the firms with greater RC are of higher levels of financial leverage. This is consistent with prior evidence that firms with greater financial constraints (due to higher financial leverage) tend to hold more cash to safeguard their financial position and mitigate the risk of liquidity tensions (Acharya et al., 2007; Ferreira & Vilela, 2004). The statistically significant differences between the resilient and non-resilient businesses are observed at the tourism-industry and the sector-levels.

In general, the non-parametric ANOVA confirms that there are statistically significant differences between the tourism businesses' performance and their cash-driven RCs (RQ3 and RQ4). Consequently, it was confirmed that companies with higher profitability, higher liquidity, and lower financial leverage demonstrate better quality of cash-driven RCs. Nevertheless, the pandemic's persistence and the related lack of cash inflows could lead to the dilution of this advantage over time.

Guided by the prior literature on cash-holdings determinants (Kim et al., 2011; Ozkan & Ozkan, 2004), we performed regression analysis to examine the importance of profitability and financial constraints in explaining the cash-driven RC in tourism businesses. In this study, the C/A remains central in scaling the two dimensions of cash-driven RC: cash holdings and cash behavior. Thus, examining the determinants of C/A could highlight the relevance of the potential COVID-19 disruptions driven by sales-costs tensions and financial constraints. Additionally, we included the sector dummy (Sec(D): 1 if travel accommodation, 0 otherwise) in the regression and the natural logarithm of assets to control for the tourism businesses' size (Size_A). Consistent with Kim et al. (2011) approach, we ran the WLS (weighted least square) regression to handle the problem of heteroskedasticity (which we have confirmed with the Breusch-Pagan test, $p < 0.000$).

Pearson's pair-wise correlations between the variables are presented in Table 11. Generally, the C/A is positively correlated at a statistically significant level to two profitability-related performance measures (ROA and PA), as well as to liquidity (LIQ) and negatively correlated to financial leverage (LEV) and size (Size_A). Overall, these findings are coinciding with our former insights on the interdependencies within cash-driven RC on a non-parametric level. In Table 12, we provide the results of the WLS regression. The model explains 50.1% of the variation in C/A (given the adjusted R-square), which is comparable to Kim et al.'s (2011) findings, and we controlled the model for multicollinearity, which was not a concern in our case (the VIFs below 10).

The regression results support prior findings that more profitable firms tend to hold more cash. There is a strong and statistically significant relationship between the ROA and C/A (positive Beta coefficient of 1.376, $p < 0.000$) and the PA and C/A (positive Beta coefficient of 0.434, $p < 0.000$). It indicates that more profitable firms tend to hold higher cash reserves and thus distinguish with greater available financial slack holdings. However, if we consider the operating profit margin (OPM), which captures the direct relationship between sales revenues and operating costs, there is a strong negative impact on the C/A, as the Beta coefficient is negative (−1.240, $p < 0.000$). It suggests that firms with lower operating profit margins tend to hold more cash. This may also suggest that firms that face greater operational risk (and operate close to break-even-point) tend to safeguard their financial situation against the adverse changes of sales revenues (decline) or operating costs (increase).

In this study, liquidity positively impacts cash holdings (positive Beta coefficient for LIQ of 0.583, $p < 0.000$). It suggests that the financial liquidity position is strongly tied to high cash holdings. This observation is consistent with the expectation and suggests that cash holdings are relevant for maintaining the financial liquidity, as measured by the liquidity ratios. Further, we observe that firms in the tourism industry

Table 12
WLS regression model for determinants of cash ratio in the tourism industry.

Variables	B Coefficient	Beta Coefficient	t-Statistic	Significance	VIF
Constant	5.876 ***		7.977	.000	
ROA	1.376 ***	.047	4.263	.000	1.134
PA	.434 ***	.460	27.530	.000	2.644
OPM	−1.240 ***	−.316	−22.703	.000	1.831
LIQ	.583 ***	.440	34.457	.000	1.543
LEV	.609 ***	.100	7.569	.000	1.642
Sec(D)	−.442 ***	−.142	−10.569	.000	1.699
Size_A	−.052 ***	−.079	−6.883	.000	1.254
Observations = 4728					
Adjusted R-square = 0.501					
Model F = 678.533***					

Notes: Statistically significant at ***α = 0.001; the dependent variable C/A (cash ratio), in natural logarithm; all performance characteristics in natural logarithms; Sec(D) is a dummy variable that denotes the sector: 1 for travel accommodation, 0 otherwise.

Table 11
Pearson correlation coefficients.

	C/A	ROA	PA	OPM	LIQ	LEV	Sec(D)	Size_A
C/A	1	.141***	.561***	.009	.477***	−.032*	−.438***	-.086***
ROA		1	.097***	.055***	.192***	−.313***	−.076***	.059***
PA			1	.119***	.153***	.190***	−.517***	−.152***
OPM				1	.009	−.032*	−.005	−.020
LIQ					1	−.474***	−.214***	.030*
LEV						1	−.040**	−.122***
Sec(D)							1	−.257***
Size_A								1

Notes: Statistically significant at ***α = 0.001; **α = 0.01; *α = 0.05. All performance characteristics in natural logarithms. Sec(D) is a dummy variable that denotes the sector: 1 for travel accommodation, 0 otherwise.

with higher leverage tend to hold more cash, which is confirmed by the positive Beta coefficient for LEV (0.609, $p < 0.000$). This is consistent with the view and prior evidence that highly leveraged firms tend to hold more cash to diminish financial constraints (Acharya et al., 2007; Ferreira & Vilela, 2004). This finding is also consistent with our prior observation on the non-parametric level.

Regression results also confirm that larger firms tend to hold less cash, as Beta coefficient for Size_A is negative (-0.052, $p < 0.000$). These findings are consistent with prior literature evidence on the determinants of cash holdings (Kim et al., 2011; Opler et al., 1999). It suggests that smaller firms that operate in tourism industry tend to hold more cash to counterbalance their greater propensity to financial distress due to their limited access to external funding.

Finally, the negative Beta coefficient (-0.442, $p < 0.000$) for the sector dummy Sec(D) confirms that firms in tourism services hold greater stock of cash than firms in accommodation. This is consistent with the former observations on non-parametric level, as confirmed with the statistically significant differences between the mean values of C/A in these two sectors.

5. Conclusions

This work explores the cash-driven RCs of tourism businesses that actively perform in Czech Republic, Hungary, Poland, and Slovakia. Theoretically, the cash-driven RCs were addressed as the relevant determinant of the business's preparedness to the consequences of the COVID-19 outbreak. The evaluation of these capabilities was framed within a merger of three concepts: organizational resilience, dynamic capabilities, and financial slack. Financial slack indicates the extent of uncommitted resources that could support the resistance of a sudden decline of cash inflows due to the loss of customers. Thus, the evaluation of cash-driven RCs of the tourism industry was attached to cash holdings as the crucial resource determining the dynamic response to disruptions.

5.1. Policy implications

The empirical investigation indicates that the cash-driven RCs of the tourism industry in the examined countries should be judged as low, as the non-resilient cases prevail over the resilient ones. In 2019, as the direct pre-COVID-19 year, nearly one-third of the businesses distinguished with low cash holdings that have been consumed since 2018. These findings indicate that the number of businesses that were not prepared to counterbalance the immediate lack of cash inflows from sales due to the lockdown is considerable. The empirical investigation also confirms that non-resilient tourism businesses are distinguished by lower profitability and higher financial constraints. It makes these companies prone to bankruptcy, given the persistence of COVID-19 and the related persistence of the disruptions in continuity of performance faced by the tourism industry worldwide.

These findings lead to the conclusion that the system interventions by the concerned governments need to address the problem of the limited borrowing capacity of the tourism industry by designing supportive tools that help to maintain liquidity or promote better access to external funding. Shortly after the COVID-19 outbreak, the tourism businesses operating in the examined countries were included under the special emergency tool packs designed for all business entities and aimed at protecting employment primarily. The emergency schemes offered aid under lending subsidy programs or tax release schemes. Some of these tools were designed only for the SME sector. However, this study confirms that the cash-driven RC of tourism businesses are not directly associated with company size. It suggests that the policy interventions and the related emergency packs should be designed to support all tourism businesses equally, regardless of their size. Greater attention should be paid to the financial constraints and profitability in the pre-pandemic period. It seems that profitable, more liquid, and less leveraged firms are better suited in this effort, as those were captured as the cash-resilient ones. However, the continuity of COVID-19 will inevitably lead to the dilution of their entry advantages.

In general, the results of this empirical investigation indicate an urgent need to develop mechanisms that could support the tourism industry respond to the negative impact of COVID-19 risk in the immediate future. The ultimate impact of pandemic on tourism industry will be inevitably amplified, as the possible persistence of the virus spread is difficult to estimate, and countries worldwide (including Central European countries) expect to face economic crises in the aftermath of the outbreak.

5.2. Managerial implications

The system interventions implemented at the governmental level are critical in supporting the cash non-resilient tourism business to better address their current needs and reduce the possible wave of bankruptcies. A well-designed scheme of interventions is of primary importance in facing the inevitable persistence of disruptions caused by the COVID-19 spread. Nevertheless, at the micro-level, tourism businesses can improve their risk response strategies in two ways: by seeking the chances for effective risk transfer mechanisms or implementing well-designed sales-costs strategies.

Effective risk transfer mechanisms can enhance the inflow of funds when faced with cash-inflow disruptions in the aftermath of a pandemic outbreak. Thus, managers need to actively monitor the risk-transfer opportunities that may emerge in the market. In particular, they should track innovations in insurance products, as they may offer a potentially effective tool in supporting the absorption of and recovery from the consequences of the loss in customers. Recently, each epidemic episode has raised a debate on the need to develop tools that will enhance businesses' abilities to overcome the devastating consequences of business interruption (Zjady, 2020). Experts predict that the insurance market will begin offering effective insurance coverage for the disruptions caused by pandemic risks for the sustainability of businesses in the tourism sector in the near future.

A well-designed sales-costs strategy may enhance the internal and external inflow of funds. While facing a decline or lack of sales revenues and related cash inflows, managers need to restrict cost management policies. This covers both the management of operating costs, as well as seeking avenues to diminish external funding costs, which are critical to surviving the liquidity tensions for numerous businesses. The higher cost of external funding is induced by the more restrictive approach in the banking system. Thus, managers need to revise their capital structure policies and prepare to react elastically in seeking more cost-effective financing strategies. In sales-related contexts, managers should prepare to implement a well-designed sales and marketing policy that will enhance the current cash-inflows from future transactions. It needs constant monitoring of system interventions and the readiness for immediate response to the release of the lockdown restrictions.

Sales-cost management needs to be adjusted to the specifics of the tourism sector. Overall, the businesses operating in services are more flexible as they hold relatively lower fixed assets and are distinguished by lower fixed costs. Therefore, sales-cost adjustments could be more manageable in tourism services than in travel accommodation. Moreover, this study shows that the percentage of cash-resilient businesses was significantly lower for travel accommodation than for tourism services. It suggests that the managers of firms operating in travel accommodation may face greater challenges in managing the COVID-19 disruptions.

5.3. Limitations of the study

This study's main limitation is that it explored cash-driven RCs of tourism businesses from a financial slack and related cash holdings perspective. Therefore, this study could be regarded as a one-dimensional analysis, as it does not control for a wider range of

organizational resilience determinants. However, although limited, the cash holdings perspective determines the businesses' capabilities to implement effective adaptive strategies in crises. In other words, businesses operating under high liquidity tensions are often incapable of implementing the desired resilience strategies. Therefore, the single-dimensional cash holdings perspective emerges as a justified prelude for the exploration of other relevant resilience determinants of tourism businesses that have faced the consequences of the COVID-19 pandemic.

Another limitation of this work pertains to the specifics of the available data and the sample. First, a major and unavoidable limitation of this analysis is that it could cover only the years up to 2019, as the accounting-based figures are lagged in time. Second, the study relied predominantly on accounting-based data, which provide a snapshot of the financial situation as an end-year observation. As an exploratory work, this study was designed to propose an analytical framework to capture cash-driven RCs as qualitative states. Thus, to some extent, it was limited by the non-parametric level of analysis of the variable. However, the regression analysis of the cash holdings determinants (as the central construct in the evaluation of cash-driven RCs) was performed to confirm the performance-related aspects.

Although the empirical investigation has embraced a large panel of accounting-based data on tourism businesses, it remained focused on the data provided for four Central European countries, which could be regarded as another limitation of this study. Overall, the investigations have led to the confirmation of several important observations on the specifics of the cash-driven RCs of the tourism industry. These observations could support the solution for problems faced by the tourism sector at a national level in a group of compared countries.

5.4. Further research

This study is exploratory in nature. The results suggest that low cash-driven RCs of the tourism industry can meet the challenges of the COVID-19 outbreak if we consider the financial consequences of the disruption of operating activity and the related customers outflow. The findings may contribute to further research endeavors in several dimensions.

First, similar inquiries could be made regarding other countries, particularly those where the tourism sector contributes considerably to the economic development. Further research could explore this by replicating the analytical framework proposed in this study. Also, the studies that will aim at confirming the cash holdings determinants will provide a relevant contribution in exploring the situation of tourism businesses operating in different settings. There is also a need to plan similar examinations in the post-COVID-19 period to identify the most important drivers of tourism businesses' resilience and to identify the most problematic areas from a financial performance perspective (sales-costs and financial constraints). In particular, by applying similar methodical approach further studies could provide the evidence on pre-vs-post pandemic cash resilience of tourism businesses, by covering the situation in 2020 and 2021.

Second, this study encourages discussion on how far the liquidity pressure (driven by low cash-driven RCs) has impacted the performance of tourism businesses by inducing bankruptcy waves. In this aspect, studies on the successful recovery paths could help to better understand the significance of cash-driven RCs, in comparison to other determinants of organizational resilience. These investigations could be performed at a company-level (the case study approach), as well as from a macro perspective by addressing the design and efficiency of system interventions. In particular, further research can provide a closer analysis of the design of the tools dedicated to support the tourism industry that were implemented at the national level and compare the effectiveness of these tools in supplying the cash resources that dried up as a consequence of the COVID-19 pandemic.

Impact statement

This study revises the cash-driven resilience capabilities of the tourism industry. The findings confirm that there is a considerable number of tourism businesses that were not prepared to counterbalance the consequences of the lockdown and the related loss of customers and decline in sales revenues. The empirical investigation confirms that these firms do not hold a buffer of cash, and at the same time are distinguished by lower profitability and higher financial constraints. In this regard, the governments interventions need to address the problem of the limited borrowing capacity of the tourism industry by designing supportive tools that help to maintain liquidity or promote better access to external funding. This study has also confirmed that the cash-driven resilience capabilities of tourism businesses are not directly associated with their size. Thus, tourism industry emergency packs should be designed to support all businesses equally, regardless of the scale of their performance.

Credit author statement

I declare sole authorship of the paper.

Declaration of competing interest

None.

Acknowledgements

I gratefully acknowledge the detailed and insightful comments provided by the anonymous Reviewers of this paper. I have also benefited greatly from the discussion on the bi-annual conference of the European Risk Research Network (ERRN) in 2018 and the suggestions on how to develop a framework of measuring financial slack. I particularly appreciate the recommendations provided by Prof. Philip Lindsley from the University of York, UK, who inspired me to explore the financial slack as a relevant driver for maintaining business continuity and resilience capabilities.

Appendix A. ANOVA results: K-W test, mean ranks

Table A1
Mean ranks of K-W test for resilience capabilities and tourism businesses location and size

Demographic characteristics		Tourism industry	ACC	SERV
Country	CZ	2520.17	1697.98	838.48
	HU	2436.59	1581.46	833.26
	SLO	2295.66	1537.50	767.09
	PL	2316.58	1515.77	804.66
Size_EMPL	micro	2112.53	1332.59	708.76
	small	1992.61	1334.05	677.25
	medium	1918.86	1295.78	640.57

(*continued on next page*)

Table A1 (*continued*)

Demographic characteristics		Tourism industry	ACC	SERV
Size_FIN	large	1949.30	1345.99	571.42
	micro	2343.10	1554.41	838.33
	small	2482.81	1716.03	766.01
	medium	2070.20	1363.63	729.54
	large	2487.68	1343.11	820.36

Table A2
Mean ranks of K-W test for resilience capabilities and tourism businesses performance.

RC (resilience capabilities)	Tourism industry			ACC			SERV		
	ROA	PA	OPM	ROA	PA	OPM	ROA	PA	OPM
Non-resilient	2066.78	2113.48	2207.09	1376.81	1317.11	1478.97	688.78	805.33	708.62
Perspective for resilience	2095.72	1837.02	2513.97	1413.70	1215.25	1657.45	723.99	743.63	769.97
Uncertain resilience	2727.47	3165.96	2153.98	1722.60	2330.37	1296.98	938.15	808.84	910.63
Resilient	2954.10	3024.00	2477.55	2015.19	2157.49	1633.74	931.96	863.63	885.87

Table A3
Mean ranks of K-W test for resilience capabilities and tourism businesses financial position.

RC (resilience capabilities)	Tourism industry		ACC		SERV	
	LIQ	LEV	LIQ	LEV	LIQ	LEV
Non-resilient	2037.64	2468.30	1346.32	1595.23	687.97	885.43
Perspective for resilience	1957.09	2458.46	1319.54	1610.53	676.65	882.90
Uncertain resilience	3009.69	2221.47	1994.62	1557.32	996.09	667.68
Resilient	3039.61	2167.35	2094.32	1406.26	941.58	735.53

Appendix B. Descriptive statistics for parametric variables

Variables	N	Min	Max	Mean	St.Dev.	Variance	Skewness	Kurtosis
Tourism industry								
C/A	4728	0.000	1.000	0.216	0.235	0.055	1.249	0.662
ROA	4728	−3.000	5.652	0.076	0.235	0.055	0.451	95.831
PA	4728	0.000	76.826	2.351	3.341	11.160	5.861	80.485
OPM	4728	−4805.280	425.600	3.634	97.853	9575.231	−33.927	1438.471
LIQ	4728	0.017	988.000	3.346	24.040	577.916	33.014	1247.118
LEV	4728	−0.526	14.917	0.624	0.641	0.411	8.257	118.230
ACC								
C/A	3115	0.000	0.935	0.142	0.181	0.033	1.883	3.177
ROA	3115	−3.000	1.769	0.062	0.219	0.048	−2.040	34.595
PA	3115	0.000	16.400	1.352	1.850	3.421	2.718	9.711
OPM	3115	−4805.280	425.600	4.119	115.897	13432.125	−30.134	1098.686
LIQ	3115	0.017	402.000	2.688	11.482	131.840	25.398	765.380
LEV	3115	−0.526	14.917	0.626	0.725	0.525	7.800	100.448
SERV								
C/A	1613	0.001	1.000	0.360	0.258	0.067	0.518	−0.715
ROA	1613	−2.800	5.652	0.104	0.262	0.069	3.148	148.229
PA	1613	0.007	76.826	4.279	4.524	20.469	5.443	59.048
OPM	1613	−1573.930	239.570	2.698	46.144	2129.239	−26.960	879.680
LIQ	1613	0.059	988.000	4.616	37.915	1437.537	23.242	575.374
LEV	1613	0.001	9.571	0.620	0.435	0.189	7.655	130.497

Notes: Descriptive statistics for raw data.

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