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Early and late-stage startup funding in hospitality: Effects on incumbents' market value

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Abstract
This study investigates the effect of funding rounds received by travel startups to assess stock market awareness of these potential new entrants. Using event analysis on the incumbent firms' stock market value we found that early-stage funding for startups offering traditional and alternative hotel and lodging services have a negative and positive effect, respectively. For startups offering intermediary services we found a negative effect of late-stage funding rounds. The effects also differed depending on the level of market commonality and resource similarity between startups and incumbent hotel firm. The findings support awareness of competition as a critical managerial task. This study offers an understanding of startups in the travel industry and provides insights for practitioners.

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Keywords
Startup funding, Market value, Event analysis, Competitive dynamics, Market commonality, Resource similarity

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1. Introduction

Research on startups in the hospitality and tourism industry has been dominated by studies of short-term rental platforms, specifically Airbnb. Past studies mostly investigate effects on consumer behavior (Belarmino & Koh, 2020; Dolnicar, 2019), on hotel properties (Blal, Singal, & Templin, 2018; Hajibaba & Dolnicar, 2017), and whether short-term rentals have a substitutive or complementary function to established incumbents. However, as venture capitalists invest several billion US$ a year in travel startups beyond short-term rental platforms (Prieto, 2020; Schroeder, 2021) it is necessary to understand how incumbent hotel and tourism firms respond to startups. In this study, we assess the effect of funding rounds received by travel startups on the market value of publicly traded firms. We do so to understand if incumbent hotel firms' investors learned from the success of short-term rental platforms and whether investors' risk assessment, like incumbents' risk assessment, is influenced by resource similarity and market commonality.

The industry disruption triggered by Airbnb led to a shift in the competitive landscape and blurred established competitive boundaries as hotels started to compete directly with firms that were previously considered to be operating in different markets (Pechlaner, Giulia Dal, & Volgger, 2012; Zach, Nicolau, & Sharma, 2020). Such competitive shifts and unclear boundaries alter how incumbent firms identify competitors and can thus increase the range and the number of competitors for incumbent hotel firms (Chen, 1996; Withers, Ireland, Miller, Harrison, & Boss, 2018). This can negatively affect incumbents' market positions and market value (Chen, 1996). On the other hand, startups can introduce innovation to an industry (Nanda & Rhodes-Kropf, 2013), which leads to higher market valuation for incumbents (Yinqiao Li, Spigt, & Swinkels, 2017; McDonald & Allen, 2021). Hence, assessing how travel startups affect incumbent hotel firms becomes critical for a better understanding of how the travel industry is evolving.

This study investigates the change in investors' awareness of startups following received funding rounds. We specifically investigate the stock market assessing startups as potential new entrants in an industry that overlooked the disruptor Airbnb to the point where consumers started to embrace the new products, thus costing incumbents market share. This study contributes to the literature on competitive dynamics by investigating resource similarity and market commonality as potential influencer of investors' awareness. Furthermore, this study offers a new contextualization for studies connecting risk assessment and market value and contributes to the tourism and hospitality literature by investigating investors' awareness of potential new market entrants. Finally, this study provides managerial insights as it highlights what high-level decision makers can learn from the stock markets' reactions to startup funding as a means of anticipating possible changes in the competitive environment.

2. Literature review

2.1. Startup effects

Startups are firms in their early stage of development entering a market with a potentially scalable business model (Blank, 2013; Mollick, 2014; Ostrom et al., 2010) and have been extensively studied

in finance and management literature. These studies investigate startup abilities to create innovation (Nanda & Rhodes-Kropf, 2013; Skala, 2019) and factors that lead to startup success such as interfirm cooperation and alliances (Baum, Calabrese, & Silverman, 2000; Shan, Walker, & Kogut, 1994), changes in the management structures (Ewens & Marx, 2018), and effects of external financial shocks on startups' launch and survival (Albert & Caggese, 2021; Nanda & Rhodes-Kropf, 2013). Finally, the relationship between the stock market and startups has been studied extensively.

The stock market has a recycling role for startups (Gompers & Lerner, 1999; Lin & Smith, 1998) as venture capitalists that have provided their expertise to help a startup grow, re-direct their resources to new ventures after that startup goes public. The role of the stock market is not, however, limited to the recycling effect. The stock market can also inform incumbent firms about the role of newly founded startups. McDonald and Allen (2021) related fintech startup funding to incumbents' market value and found that funding received by startups that employed an unusual combination of resources had a negative effect on incumbent firms. In addition to the stock market favoring the development of startups (Michelacci & Suarez, 2004) and assessing startups' contributions to the field (McDonald & Allen, 2021), there is the need to distinguish between early-stage and late-stage startups. This is because startups at different funding stages represent different types of business. The key features of early-stage startups are innovation and limited resources, while late-stage startups exploit market-disruptive situations to achieve high scalability and high valuation (Skala, 2019).

Startups are typically funded using a staged financing approach. Accordingly, a startup receives initial financing that only allows it to proceed until a certain pre-established date when additional funding will be needed (Da Rin, Hellmann, & Puri, 2013). This is used by investors to limit their risk and to set milestones for the startup's development (Bienz & Hirsch, 2012; Da Rin et al., 2013). Hence, in the early stages of their development, startups will receive financing based on their ability to show that their business model is profitable (Bienz & Hirsch, 2012). Later stage funding is granted to expand their market (Bienz & Hirsch, 2012). A startup in the later development stages is thus indicative of a bigger market and higher prospective success. A larger financial footing makes a startup more recognizable as a new competitor and as a possible threat and thus attracts attention and awareness from incumbents' executives and stakeholders (Chen & Miller, 1994; Chen, Su, & Tsai, 2007). Indeed, Airbnb was initially not perceived as a critical competitor by multinational hotel corporations until it received financing to expand its US market reach. At that point it become of national interest incumbent US hotel executives and shareholders started to consider it as a competitor and reacted (Zach et al., 2020).

In the hospitality and tourism literature, a deeper understanding of the relationship between startups as new market entrants and incumbents is missing. However, hospitality and tourism literature recognized that the startup Airbnb had the capacity to challenge the established lodging market (Dolnicar & Zare, 2020; Bianco, Zach & Singal, 2022). Also, Guttentag (2015) analyzed the sharing economy at the example of Airbnb and found that its distinct sets of benefits and its internet-centered business model let to changes in the lodging market. Ultimately firms in the sharing economy developed into the short-term rental market (Dolnicar, 2018), which resulted in new consumers demanding new and more unique experience (Tussyadiah & Pesonen, 2016). As such,

startups, or at least Airbnb as a very prominent example, can change the travel market and challenge established hotel firms. The rise of the sharing economy thus requires established firms to adjust their business to either adapt a sharing economy approach or trying to fend it off.

In the case of publicly traded firms not only the firms themselves, but also the stock market has adapted its understanding of startups. Competitive countermoves by established hotel firms in response to the short-term rental market were rewarded by the stock market (increase in market value) only for the first mover firm whereas all other established firms saw a negative effect on market value (Zach et al., 2020). Before startups become competitive actors in the marketplace and incumbents potentially respond, startup funding might already affect hospitality firms' market value, specifically in the time since Airbnb became a prominent example of a successful startup.

2.2. Awareness of new competitors

Literature on competitive dynamics investigates how firms compete with each other (Chen & Miller, 2012). Kim, Lee, and Roehl (2018) analyzed competitors' reactions of reducing hotels' room rates while Zhang, Geng, Huang, and Ren (2021) used competitive dynamics to evaluate reactions of peer-to-peer accommodation hosts to assess reactions to COVID-19. Furthermore, Schwartz and Webb (2021) used competitive dynamics to investigate competitive sets for hotel locations. The majority of management literature on competitive dynamics focuses on investigating direct and indirect competitive actions from target firms as well as reactions of competitors (Smith, Ferrier, & Ndofor, 2001). These studies find that the effectiveness of a competitive action is connected to magnitude, diversity, and speed of the reaction (Chen & Miller, 1994, 2015; Uhlenbruck, Hughes-Morgan, Hitt, Ferrier, & Brymer, 2017). The speed of the reaction was, in fact, one of the reasons that led some incumbent hotel firms to be rewarded by the stock market after reacting to Airbnb (Zach et al., 2020).

Essential for the investigation of firms' competitive behavior, is the understanding of behavioral drivers of interfirm competition. Previous research stated that firms will not be able to respond to an action undertaken by a competitor unless they are aware of the competitive action (Chen, 1996; Chen & Miller, 2012; Yu & Cannella, 2007). Awareness of competition is seen as a critical cognitive process that includes firms' recognition of their competitive environment (Zhang et al., 2021). Thus, if a firm is not aware of the presence of another firm in its competitive landscape, it will not trigger the need for a reaction (Chen, 1996). Chen et al. (2007) found that an awareness of competitive tensions is perceived equally by executives and shareholders, confirming the premise of a social construction view of competition promoted by neo-institutionalists. According to this view, corporate assets are combined following pressures from investors, who are seen as having an important influence on a firm's behavior (Connelly, Lee, Tihanyi, Certo, & Johnson, 2019; Zuckerman, 2000). Hence, awareness is experienced by a firms' executives and shareholders simultaneously. An example among travel firms was the shift from a model in which hotel firms owned all of their assets to an asset-light model (Yuan Li & Singal, 2019).

Awareness has been used to analyze how executives and shareholders detect and recognize their rivals in different contexts, such as market entry (Baum & Korn, 1996; Markman & Waldron, 2014) or mergers and acquisitions (Haleblian, McNamara, Kolev, & Dykes, 2012). Understanding how firms and the stock market become aware of potential rivals is particularly important in a rapidly

changing competitive environment where the advent of technology has led firms that previously were not rivals to compete with each other (Chen & Miller, 2015; D'Aveni, Dagnino, & Smith, 2010; Downing, Kang, & Markman, 2019). To this extent, knowing incumbent hotel firms' and investors' awareness toward startups entering the industry, allow to determine the perceived threat that incumbents attribute to startups. This is particularly important as startups, despite being potential competitors, often have different characteristics compared to incumbent firms (McDonald & Allen, 2021). Hence, it is important to understand how the difference in characteristics between startups and incumbent hotel firms may affect awareness.

2.3. Resource similarity

Chen (1996) demonstrated that the degree of resource similarity between a focal firm and a possible competitor triggers awareness of competition and possibly results in a counter move. For this reason, resource similarity has been used to identify competitive groups (Peteraf, 1993). For example, a hotel franchisor is more inclined to recognize as a direct competitor another firm with similar resources, such as another hotel franchisor, rather than a possible competitor that has different resources, such as a short-term rental provider or an online travel agency. Consequently, a focal firm will be more inclined to respond to competitive action from a firm with a similar bundle of resources. This is also because firms are more connected to and aware of other firms that are considered to be within their industry (Chen, 1996). Consequently, a startup which operates in a completely different way compared to established hotel firms, can be perceived by incumbents as residing outside industry boundaries and not be regarded as a competitor.

We argue that the success of Airbnb has resulted in incumbent hotel executives and shareholders starting to take cues from rivals who possess a different bundle of resources (Downing et al., 2019). For example, hotel firms today compete with short-term rental firms that are essentially technology firms serving as a platform to connect travelers with hosts (similar to an online travel agency) under the brand name of the platform. Incumbent hotels had to decide to compete with short-term rentals by offering similar service, adjusting current services, or ignoring this new competition altogether (Withers et al., 2018). Most hotel firms started to develop their own services (Zach et al., 2020), thus competing with rivals who possess little to no resource similarity (Chen, 1996). Indeed, the hospitality industry is prone to competing with such rivals as there are no important barriers to entry (Pechlaner et al., 2012).

2.4. Market Commonality

Market commonality is the degree to which two firms compete in the same market (Schwartz & Webb, 2021) and influences firms' awareness of a competitor as two firms operating in the same market are more aware of each other compared to two firms operating in distinct markets (Chen, 1996). However, this original theorizing of market as a geographical market has been extended to also include different customer markets (Cooper & Inoue, 1996). Within the context of this research, we use market commonality in its original definition of overlapping geographical markets between two firms (see Chen, 1996). Hence, two firms will be regarded as having a high degree of market commonality if their core markets are geographically the same. Thus, a hotel franchisor that mostly operates in the United States, will have a higher degree of market commonality with similar

firms that mostly operate in the United States and a lower degree of market commonality with similar firms that primarily operate in China.

The shift in the competitive landscape caused by Airbnb (Withers et al., 2018) not only affected hotels in their core markets, but also had a strong impact on different markets around the world (Dogru, Hanks, Mody, Suess, & Sirakaya-Turk, 2020). This shows that a travel startup funded in one part of the world can have a direct effect on hotel operations in very distant parts of the globe as hotel guests travel internationally. The aforementioned phenomenon is particularly important for hotel incumbents in the United States as they compete globally, despite having the majority of their operations in the United States (Xu, Ye, & Chan, 2018). Furthermore, incumbent hotel firms mostly rely on a franchising model, hence their value increases along with the number of customers that their brands are able to attract (Alon, Ni, & Wang, 2012). Consequently, it is possible that new competitors create a critical mass of followers outside the incumbents' core market, even before entering that market. In that case, these new entrants would be direct competitors without having a strong degree of market commonality with incumbent firms. One such an example is OYO rooms, an Indian lodging startup that became one of the biggest hotel firms in the world in terms of rooms even before opening its first hotel where American incumbent firms have their core market.

3. Methodology

We conduct an event analysis to address our research question which aims at gaining a better understanding of the change in stock market awareness of new competitors in the travel industry. Specifically, we estimate the daily cumulative abnormal returns (CAR) as the market value of firms, followed by the analysis of the effect of startup funding rounds on incumbents' market value from 2011 to 2019. We do so as a firm's market value is affected by what its shareholders regard as a potential threat or a potential opportunity (James & Valenzuela, 2020). Furthermore, we analyzed the effects of resource similarity, market commonality, and a startup's investment stage in driving incumbents' market value. The effect of resource similarity is calculated by evaluating the effect of funding rounds obtained by different types of startups (traditional lodging, alternative lodging, or lodging intermediary) on incumbents' market value. The effect of market commonality is calculated by comparing the effect of funding for startups in the same country in which incumbent firms host the majority of their operations with funding of startups abroad. Finally, a possible differential effect connected to the investment stage of the funded startup is addressed by distinguishing between effects of early-stage investments and late-stage investments. To ensure the robustness of the results, sensitivity tests are conducted by running models with different timespans as subsamples.

3.1. Market value

A five-factor Fama-French model with momentum effects (Fama & French, 1992) is proposed as follows to estimate the daily cumulative abnormal returns.

$$R_{it} = \alpha_j + \beta_1(R_{m,t} - R_{f,t}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(RMW_t) + \beta_5(CMA_t) + \beta_6(WML_t) + \varepsilon_{it} \quad (1)$$

where R_{it} represents the return for firm *i* during period *t*. $R_{m,t} - R_f$ is the excess return on market portfolio during period *t*. α_j represents regression coefficients, while SMB and HML represent size

premium and value premium, respectively. Size premium and value premium are used in the model to control for firms that have a small market cap and generate high returns (SMB), and for stock with high book-to-market value that generate higher returns compared to the market (HML) (Fama & French, 1992). RMW measures the difference of returns on portfolios with robust and weak performance whereas CMA represents the gap of returns on portfolios with low and high investments. WML stands for the momentum return which is measured by the difference of returns on the winner and loser portfolios in the past year. $R_{m,t} - R_f$, SMB and HML are determinants included in the traditional Fama-French three-factor model (Fama & French, 1992). Carhart (1997) added WML as another determinant in the asset pricing model. Fama and French (2015) further introduced RMW and CMA into the model, expanding the model from three to five factors. They also claimed that with the introduction of new determinants into the model, the prediction power has been significantly improved. Thus, the five-factor with momentum effects model is selected to estimate the daily cumulative abnormal returns (CAR) which is the gap between R_{it} and the expected return (i.e. the residual in Equation 1).

3.2. Event Analysis

To assess incumbents' market value coincidently with startup funding rounds, we employ an event analysis to examine incumbents' stock fluctuation at the same time a new entrant receives a funding round and to assess the effect that this will have on the value of the firm itself. This is based on the efficiency market hypothesis, widely used in market value assessments in finance research. According to this fundamental hypothesis, all relevant information is known by the stock market and stocks are priced accordingly (Jones, Reed, & Waller, 2016). Hence, a change in the market value of a firm, coinciding with a funding round, represents the long-term effect on that firm, discounted in relation to the investigated time and reflected in the market value (James & Valenzuela, 2020; Jones et al., 2016).

We estimate the effect of each funding round using three different time windows: the day of the event t_0, three days (t_{-1} to t_1), and seven days (t_{-2} to t_4) around the event date. Increasing time windows are used to estimate effects on the market for different days after the event and to allow for any leakage of the news prior to the event (Swidler, Trinh, & Yost, 2019). *t*-test is employed to examine if there is a significant difference between observed CARs post founding rounds in each time window and counterfactual CARs which assumes no events happened. The counterfactual CARs in each time window are defined as the mean of an 80-days average returns in a 140-day period (-150 to -10) before each founding round.

3.3. Data

Funding round data was gathered from CrunchBase, a database containing data on startups including funding rounds and the type of funding. To create our sample, we filtered for startup profiles that included the word "hotel" or "lodging" in their list of industries, resulting in 2,605 startups. Among these, only 275 had received any type of funding during the study period from 2011 to 2019. We thus focused our study on the years after the end of the 2008 Global Financial Crisis similar to McDonald and Allen (2021) and before the COVID-19 pandemic to eliminate the impact of systematic risk on returns. As only hotels and lodging providers were considered for this research, startups that listed the lodging industry as a possible client but are not hotel or lodging

startups were excluded from the analysis. This process led to a final sample of 205 startups operating in the hotel and lodging industry.

In order to test the effect of different types of startups on incumbent market value, and hence, the effect of resource similarity, the remaining startups are grouped into three main categories. First, traditional lodging startups are those that offer a type of service only connected to hotel establishments. Examples are 25Hours hotels, a growing European hotel chain, or Brilatta, which offers support services for hotel supervisors. Second, alternative lodging startups are firms that offer all other types of accommodation services; for example, AutoCamp which offers modern camping in Airstream trailers, Generator Hostel or BXTR which are hostels with a design focus or Sonder, a short-term rental platform specialized on business travelers. Third, lodging intermediaries are firms that occupy an intermediary role between guests booking accommodation and lodging establishments. This includes online travel agencies such as BookItGreen, which specializes in sustainable hotels, or StayForLong, a booking platform specifically for extended stays. The startups were coded into the three categories by each author independently, followed by a discussion and communication with industry experts to resolve divergence.

The sample of 205 startup firms received a total of 343 funding rounds, which were treated as events in our event analysis. These funding rounds were divided into two main categories: early-stage funding and late-stage funding. This categorization reflects the startup's investment stage. Early-stage startups have an idea or proof of concept, but their size and market are still relatively small (Davila, Foster, & Gupta, 2003). Early-stage investments include Angel Investment, Seed Funding, and Series A funding types. Investment types such as series B to F or secondary market funding are received by firms in a later stage of their development when the startup has already tested and proven its concept and is looking to expand its market (Davila et al., 2003). As we investigate US-based lodging firms we consider funding for US-based startups as high market commonality and non-US-based startups as low market commonality (see Table 1).

Finally, stock market data were obtained from the database belonging to the Center for Research in Security Prices (CRSP), detailing all hotel firms listed on the New York Stock Exchange (NYSE) or the NASDAQ stock exchange in the period between 2011 and 2019. Holding daily returns were collected for a period of two years prior to the first event analyzed. Descriptive statistics of daily return rates of 24 incumbent hotel firms are presented in Table 2. The means of daily return rates in the selected time period ranged from 0.00003 to 0.0018 which are equivalent to annual return rates from 0.99% to 53.87%.

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Table 1 Count of Funding Rounds

		By lodging startup type			By investment stage		By market	
	Full Sample	Traditional lodging	Alternative Lodging	Lodging Intermediaries	Early-stage	Late-stage	US-based	Non US-Based
2011	14	5	6	1	9	5	2	12
2012	23	11	6	5	11	12	2	21
2013	21	6	5	5	9	12	6	15
2014	24	12	2	5	15	9	6	18
2015	46	23	8	10	27	19	17	29
2016	54	29	10	9	33	21	17	37
2017	60	32	11	13	42	18	17	43
2018	54	28	13	3	35	19	21	33
2019	47	16	10	7	32	15	13	34
Total	**343**	**162**	**71**	**58**	**213**	**130**	**101**	**242**

Note: US-based = high market commonality as we investigated 24 US-based firms; Non US-based = low market commonality.

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Table 2 Descriptive Statistics of Daily Return Rate of Selected Hotels

	Mean	Median	Standard Deviation	Min	Max	Sample Size
Apple Hospitality REIT	0.00008	0.00054	0.01007	-0.05580	0.03664	1,015
Ashford Hospitality Trust	0.00057	0.00097	0.02554	-0.27136	0.14085	2,516
Belmond Hotels	0.00072	0.00000	0.02635	-0.13601	0.39830	2,337
Chatham Lodging Trust	0.00041	0.00054	0.01643	-0.20451	0.09397	2,295
Choice Hotels International	0.00075	0.00090	0.01392	-0.10552	0.08125	2,516
Diamond Rock Hospitality	0.00042	0.00083	0.01860	-0.12427	0.11820	2,516
Extended Stay America	0.00003	0.00048	0.01753	-0.21459	0.12899	1,393
Hersha Hospitality Trust	0.00045	0.00000	0.01945	-0.11351	0.14780	2,516
Hilton Worldwide	0.00070	0.00060	0.01461	-0.07333	0.06795	1,373
Host Hotels and Resorts	0.00047	0.00066	0.01745	-0.12343	0.08820	2,516
Hospitality Properties Trust	0.00041	0.00071	0.01475	-0.10940	0.12861	2,516
Hyatt Hotels Corporation	0.00048	0.00053	0.01580	-0.08717	0.07570	2,405
Innsuites Hospitality Trust	0.00118	0.00000	0.04591	-0.22360	0.42308	2,516
InterContinental Hotels Group	0.00084	0.00117	0.01583	-0.08266	0.08479	2,516
Marriot International	0.00088	0.00090	0.01586	-0.07430	0.07380	2,516
Pebblebrook Hotel Trust	0.00044	0.00053	0.01697	-0.08098	0.07539	2,382
RLJ Lodging Trust	0.00037	0.00056	0.01427	-0.07112	0.07931	2,025
Ryman Hospitality Properties	0.00098	0.00075	0.01894	-0.12612	0.14823	2,516
Sotherly Hotels	0.00096	0.00000	0.02478	-0.12609	0.15021	2,516
Summit Hotel Properties	0.00050	0.00064	0.01630	-0.09966	0.07652	2,088
Sunstone Hotel Investors	0.00050	0.00073	0.01927	-0.15855	0.10454	2,516
Wyndham Hotels & Resorts	0.00095	0.00070	0.01760	-0.12058	0.18980	2,516
Xenia Hotels & Resorts	0.00049	0.00045	0.01540	-0.06963	0.08354	1,086

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4. Results

4.1. Estimation Results of Five-factor Fama-French Model with Momentum Effects of Selected Hotels

Table 3 displays the estimation results of the five-factor asset pricing model with momentum effects. Adjusted R^2 ranged from 0.23 to 0.55, indicating good model fit of the five-factor model with momentum effects. As suggested by Fama and French (1992), the excess return on market portfolio $(R_{m,t} - R_f)$ and the difference between stocks that generate a small and big returns (SMB) are the most significant factors as they are significant in 23 and 22 out of 24 hotel firms, respectively, followed by stocks with high book-to-market value (HML) which has 17 significant coefficients out of 24 hotel firms. In line with Fama and French (2015), coefficients that measure the return on portfolios with robust and weak performance (RMW) and the gap in returns on portfolios with low and high investments (CMA) are also influencing factors to return rates and most hotels presented significant effects of RMW and CMA. Although only four out of 24 models observed significant effects of momentum return (WML), it is maintained in the model as a control variable to keep the consistency with the original literature (Carhart, 1997; Fama & French, 2015). The gap between observed and expected return rate, which is the residual of the estimation, is used as the abnormal return rate for further analysis.

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Table 3 Estimation Results of Five-factor Fama-French Model with Momentum Effects

	Constant	$R_{m,t} - R_f$	SMB	HML	RMW	CMA	WML	Adjusted R^2
	-0.000	0.006	0.003	0.000	0.004	0.002	0.000	
Apple Hospitality REIT	(-0.87)	(16.96)***	(6.21)***	(1.56)	(4.89)***	(1.82)*	(-0.43)	0.28
	-0.000	0.013	0.012	0.004	0.004	0.005	-0.000	
Ashford Hospitality Trust	(-0.19)	(26.28)***	(13.86)***	(4.86)***	(2.92)***	(2.63)***	(-0.41)	0.36
	-0.000(	0.013	0.010	0.002	-0.000	0.005	0.000	
Belmond Hotels	-0.08)	(24.14)***	(10.43)***	(1.96)**	(-0.20)	(2.65)***	(1.87)*	0.34
	-0.000	0.008	0.008	0.002	0.002	0.002	-0.000	
Chatham Lodging Trust	(-0.05)	(25.57)***	(12.81)***	(3.11)***	(2.51)**	(1.71)	(-0.03)	0.35
	0.000	0.009	0.003	-0.001	0.002	0.002	0.000	
Choice Hotels International	(1.08)	(34.96)***	(5.94)***	(-2.12)**	(2.97)***	(2.13)**	(0.33)	0.41
	-0.000	0.012	0.007	0.005	0.000	0.004	0.000	
Diamond Rock Hospitality	(-0.68)	(37.78)***	(13.55)***	(6.44)***	(0.79)	(3.73)***	(0.49)	0.52
	-0.000	0.009	0.005	0.000	0.002	0.000	-0.000	
Extended Stay America	(-0.68)	(17.45)***	(5.90)***	(0.49)	(1.22)	(0.51)	(-0.84)	0.23
	-0.000	0.011	0.009	0.005	0.002	0.002	0.000	
Hersha Hospitality Trust	(-0.33)	(30.61)***	(15.08)***	(6.43)***	(1.67)*	(1.88)*	(0.43)	0.44
	0.000	0.011	0.002	-0.001	0.002	0.000	-0.000	
Hilton Worldwide	(0.72)	(28.17)***	(3.26)***	(-2.03)**	(2.63)***	(0.42)	(-0.33)	0.41
	-0.000	0.013	0.003	0.004	0.001	0.004	0.000	
Host Hotels and Resorts	(-0.79)	(44.73)***	(7.28)***	(6.52)***	(1.67)*	(4.18)***	(0.29)	0.56
	-0.000	0.010	0.003	0.002	0.002	0.005	0.000	
Hospitality Properties Trust	(-0.64)	(39.92)***	(7.54)***	(2.98)***	(2.89)***	(5.54)***	(0.41)	0.49
	-0.000	0.010	0.003	0.001	0.000	-0.000	-0.000	
Hyatt Hotels Corporation	(-0.20)	(35.10)***	(6.82)***	(1.94)*	(0.58)	(-0.47)	(-1.04)	0.44
	0.000	-0.000	0.001	0.000	0.007	-0.000	0.000	
Innsuites Hospitality Trust	(1.26)	(-0.14)	(0.53)	(0.37)	(2.12)**	(-1.45)	(0.08)	0.00
	0.000	0.011	0.011	-0.000	0.000	0.002	-0.000	
InterContinental Hotels Group	(1.14)	(40.36)***	(2.14)**	(-0.15)	(1.21)	(2.14)**	(-1.33)	0.47
	0.000	0.012	0.002	0.000	0.002	0.001	-0.000	
Marriot International	(1.12)	(47.74)***	(4.56)***	(-0.52)	(3.12)***	(1.45)	(-1.14)	0.55
	-0.000	0.011	0.007	0.003	0.004	0.001	-0.000	
Pebblebrook Hotel Trust	(-0.38)	(32.69)***	(13.11)***	(4.72)***	(4.29)***	(1.07)	(-0.84)	0.44
	-0.000	0.010	0.006	0.002	0.005	0.003	-0.000	
RLJ Lodging Trust	(-0.54)	(20.32)***	(11.86)***	(2.85)***	(6.32)***	(3.00)***	(-0.07)	0.37
	0.000	0.012	0.007	0.001	0.000	0.005	0.000	
Ryman Hospitality Properties	(1.01)	(36.33)***	(11.62)***	(2.13)**	(1.00)	(4.65)***	(2.78)***	0.48
Sotherly Hotels	0.000	0.006	0.000	0.000	0.002	0.004	0.000	0.04

	(1.27)	(9.69)***	(0.63)	(0.35)	(1.37)	(1.78)*	(0.58)	
	-0.000	0.009	0.007	0.002	0.004	0.002	0.000	
Summit Hotel Properties	(-0.14)	(24.15)***	(10.83)***	(2.03)**	(4.31)***	(1.45)	(1.80)*	0.31
	-0.000	0.012	0.007	0.003	0.000	0.004	0.000	
Sunstone Hotel Investors	(-0.56)	(38.63)***	(12.59)***	(5.83)***	(0.22)	(3.77)***	(0.95)	0.52
	0.000	0.013	0.004	0.001	0.004	0.000	0.000	
Wyndham Hotels & Resorts	(1.03)	(43.12)***	(7.59)***	(2.17)**	(4.32)***	(0.95)	(0.52)	0.52
	0.000	0.010	0.008	0.002	0.004	0.003	0.000	
Xenia Hotels & Resorts	(0.15)	(21.13)***	(10.18)***	(2.55)**	(3.47)***	(2.13)**	(2.11)**	0.38

Note: Numbers in brackets are *t*-statistics. *, ** and *** represent significant at 10%, 5% and 1% significant level, respectively.

4.2. Results of Event Analysis

Table 4 shows the effect of funding rounds received by lodging startups on incumbents' market value. A significant positive difference can be observed in the 7-day window when using the full sample, but not in 1-day and 3-day windows. Investors took investments in travel startups as a positive signal reflecting the market's confidence in the hospitality industry, and thus led to an increase of cumulative abnormal returns (CAR). Such signals can also be found for funding rounds received by early-stage startups in all three-time windows and startups with low commonality in the 7-day window. While there was no change in the effect of funding rounds received by lodging intermediary startups, there are indeed significant CAR differences caused by funding rounds for traditional and alternative lodging startups, respectively. A significant negative effect can be observed in traditional lodging startups in the 3-day window, suggesting the market consider traditional lodging startups as competitors to listed firms. On the other hand, significant positive CAR gaps can be found in funding rounds to alternative lodging startups in all three windows. This means the market is keen to embracing innovations in the lodging industry and consider those startups as complements to traditional hospitality service.

Table 4 Difference of Cumulative Average Return with and without Startup Funding Rounds

		Startup category		
	Full sample	**Traditional lodging**	**Alternative lodging**	**Lodging intermediary**
1-Day	0.056	-0.139	0.321**	0.075
3-Day	0.118	-0.414*	0.582**	0.020
7-Day	0.236**	-0.423	0.815**	0.057

	Investment Stage		**Market Commonality**	
	Early-stage	**Late-stage**	**High**	**Low**
1-Day	0.124**	-0.065	0.050	0.059
3-Day	0.253***	-0.124	0.200	0.085
7-Day	0.534***	-0.300	-0.010	0.334**

Note: *, ** and *** represent significant at 10%, 5% and 1% significant level, respectively.

Table 5 displays the effect of startup funding on the incumbents' market value across startup types and investment stages as well as startup types and commonality. Negative effects are observed in the 3-day window for traditional lodging startups in the early-stage and 7-day window for lodging intermediary startups in the late-stage, respectively. Although the market considered the investment in startups in the early-stage as a positive signal for the industry, traditional lodging startups are recognized as competitors even in their early-stage. Meanwhile, later-stage investments received by lodging intermediary startups negatively affected incumbents' market values. But caution is needed when explaining the above two results, as the significance is marginal. The market embraced funding rounds of alternative lodging startups in their early-stage, but not the late-stage, suggesting the market is more sensitive to newly emerged innovations.

Regarding the moderating role of market commonality, traditional lodging startups in the setting of high commonality with listed hospitality firms were considered as competitors in 3-day and 7-day windows, but not for them with low commonality. Startups with high commonality operate in the same market with incumbents and are thus more likely to be considered as potential competitors. Investments in alternative lodging startups with low commonality are recognized as confidence and positive signal to the global hospitality industry which resulted a positive impact on incumbents' market value. No significant impacts are found for lodging intermediary startups in high or low commonality settings.

Table 5 Crosstab Analysis of Difference of Cumulative Average Return with and without Startup Funding Rounds

		Investment Stage		Market Commonality	
		Early-stage	**Late-stage**	**High**	**Low**
Traditional lodging	1-Day	-0.470	-0.057	-0.295	-0.127
	3-Day	-1.047*	-0.258	-1.420**	-0.335
	7-Day	-1.013	-0.278	-2.372**	-0.270
Alternative lodging	1-Day	0.496***	0.077	0.142	0.510**
	3-Day	0.909***	0.124	0.191	0.995***
	7-Day	1.895***	-0.700	0.186	1.476***
Lodging intermediary	1-Day	0.116	-0.176	0.123	0.056
	3-Day	0.049	-0.158	0.243	-0.071
	7-Day	0.303	-1.450*	0.527	-0.135

Note: *, ** and *** represent significant at 10%, 5% and 1% significant level, respectively.

4.3. Robustness Check

The difference of cumulative abnormal returns (CARs) with and without startup funding rounds were examined by using rolling subsamples. The full sample covers years from 2011 to 2019 and the starting year moved one year forward in each subsample. Thus, the first subsample started in 2012, followed by 2013, with the last subsample being 2019 data only. The results of robustness check with subsamples are presented in Table 6. Consistent with the full sample result, positive effects were identified in most samples, particularly from 2014 onward with 2019 as an exception. The lack of a significant positive effects in 2019 can stem from Airbnb's contemplation in Spring of that year to go public, but then not committing to it and ultimately launching its initial public offering in December 2020. As the most prominent travel startup in the study period Airbnb carried considerable weight. Thus, the delay of going public while Airbnb and other lodging firms had some of their best profits might have negatively affected investors' confidence in travel startups. Furthermore, the relatively small sample size of the subsample with only 2019 data may have contributed to the insignificant results. The results across subgroups in subsamples are similar to the full sample case. We also estimate the three-factor model and got similar results too. Limited by the space these results are available upon requests.

Bianco, S., Zach, F. J., & Liu, A. (2022). Early and late-stage startup funding in hospitality: Effects on incumbents' market value. *Annals of Tourism Research*
doi:10.1016/j.annals.2022.103436

Table 6 Robustness Check

Starting year	**2012**	**2013**	**2014**	**2015**
1-Day	0.066	0.064	0.069	0.086
3-Day	0.104	0.132	0.160**	0.190**
7-Day	0.138	0.200	0.220	0.265**
Sample size	329	306	285	261
Starting year	**2016**	**2017**	**2018**	**2019**
1-Day	0.09	0.111	0.146	-0.077
3-Day	0.201**	0.332***	0.532***	-0.063
7-Day	0.302**	0.329	0.457	-0.361
Sample size	215	161	101	47

Note: *, ** and *** represent significant at 10%, 5% and 1% significant level, respectively.

5. Discussion

Our findings provide several insights for the awareness of the stock market in assessing threat or opportunities stemming from funding rounds received by hotel and lodging startups. A key finding is that market values of incumbent lodging firms are exclusively positively affected when lodging startups receive funding. This means that the stock market recognizes investments in startups as a confident and positive signal to the hospitality industry overall.

Table 7 Significant effects on incumbents' market value

	Investment Stage		**Market commonality**	
Startup category	**Early-stage**	**Late-stage**	**High**	**Low**
Traditional lodging	Negative	None	Negative	None
Alternative lodging	Positive	None	None	Positive
Lodging intermediary	None	Negative	None	None

When dividing the sample in different stages of investment to control for startups' development status (Bienz & Hirsch, 2012), we find that funding for traditional and alternative lodging startups resulted in a negative and positive effect in their early-stage, respectively. Negative effects to traditional lodging startups are in line with previous literature (e.g. Chen et al., 2007; Connelly et al., 2019) as they are recognized as competitors. The positive effect of alternative lodging startups can be explained by them being considered as complements to current hospitality services or by interpreting investors' confidence as a signal of innovation in the industry (Nanda & Rhodes-Kropf, 2013; Skala, 2019). Lodging intermediary startups are only seen as a threat when they received a late-stage investment, which implies the attainment of a sizeable network (Bienz & Hirsch, 2012) that could potentially affect the incumbents' profits. The absence of significant effects of traditional and alternative lodging startups in the late-stage but significant effects of early-stage funding on incumbents' market value suggests that only early-stage funding raises enough stock market awareness to trigger an effect on market value. Future research should also investigate if incumbents

adjusted their business following the early-stage reaction of the stock market, thus preventing an impact of later-stage funding.

Funding for traditional lodging startups results in a significant negative effect only in the case of early-stage funding or in a setting of high market commonality, that is for firms with overlapping markets. Hence, a negative effect of a startup funding round on incumbents' market value represented an awareness of the stock market that these startups are seen as a new competitor (Chen et al., 2007; Connelly et al., 2019; Shi, Connelly, Hoskisson, & Ketchen, 2020; Zuckerman, 2000).

However, in a setting of low market commonality, that is firms whose markets overlap little, we find that there is no significant effect in traditional lodging and lodging intermediary startups. Hence, in the assessment of threats or opportunities the stock market fails to recognize traditional lodging and lodging intermediary startups as possible competitors in markets other than the incumbent's core market (Shi et al., 2020). However, funding received by alternative lodging startups in low market commonality settings resulted in a positive and significant effect. This result directly contrasts what previously found by (McDonald & Allen, 2021) and suggests that the stock market acknowledges investments in innovative businesses in other countries. Investors recognize an opportunity to grow the market of incumbent firms by leveraging alternative lodging startups for their own success or it is a sign of a growing marketplace that benefits all actors in the travel market.

6. Conclusions

This research was conducted with the objective of understanding how the stock market evaluated the funding received by startups that operate in the hotel and lodging market. Our results show that, in relation to the development stage of startups, the stock market recognizes as threats (i.e. negative effect on market value) traditional lodging startups in their early-stage of development and lodging intermediary startups in their later stage of development. However, alternative lodging startups in early stages of development are seen as positive for the industry due to their capacity to innovate and potentially attract new consumers to the travel market. Looking at the degree of market commonality, the stock market regards traditional lodging startups launched in the Unites States as a threat but shows positive market reactions for alternative lodging startups launched overseas.

This research makes several theoretical and practical contributions: First, it adds to the general literature on competitive dynamics by assessing the competitive awareness of the stock market toward startups finding that investors tend to differently consider the dimension of market commonality compared to incumbent firms. For firms that are more aware of competitors that operate in the same markets (Chen, 1996) we find that investors are also considering geographically distant competitors, especially for alternative lodging startups. Second, this study adds to the management literature by contextualizing market evaluations of new competitors in the tourism and hospitality context. McDonald & Allen (2021) found that fintech investors positively evaluated traditional banking startups and negatively evaluated startups that are alternatives to traditional banks. However, we find the opposite effect for the tourism and hospitality context. This can be explained by tourism and hospitality firms and startups requiring hotels or other facilities to deliver their services in-person, whereas fintech startups are often a replacement of existing banking infrastructure such as branches.

Third, this study adds to the startup literature in hospitality and tourism research by investigating startups and their effects on incumbent firms, with specific reference to startup funding rounds and their impact on incumbents' market value. Fourth, by analyzing stock market reactions, this study finds that investors of established hotel firms are aware of travel startups as possible competitors capable of disrupting the market. This is especially the case for traditional lodging and lodging intermediary startups, while alternative lodging startups are not regarded as threats but as innovators and thus as an opportunity for incumbents to benefit of alternative lodging startup innovativeness (Nanda & Rhodes-Kropf, 2013; Skala, 2019). Finally, this research contributes to industry as these results suggest that high-level decision makers at incumbent firms should keep an eye on the funding received by startups to gauge which ones have the necessary market support to trigger disruption or bring innovation in the lodging industry. As such, by monitoring startup funding data, incumbent lodging firms could preempt moves by startups or at least shorten the time required to implement strategic responses.

This has some limitations that provide research opportunities: First, we addressed the effect of startup funding on incumbents' market value but not all hotel firms are publicly traded. Even though all major hotel firms are publicly traded, some smaller private ones may look at new possible threats from a different angle. Second, firms in the sample are all based in the USA. Major firms in other countries may evaluate threats differently. Future research may expand our analysis by investigating awareness of competition in smaller firms located in other countries. Third, this study focuses on the awareness aspect of the Awareness-Motivation-Capability pre-competition perceptions framework to assess new threats following market disruption. Future research could focus on the other two aspects, motivation, and capability, to perform a full investigation into how startups have influenced incumbents' behavioral competition drivers. Causal inference approaches such as regression discontinuity design can be used to identify the causal effect of interventions with the inclusion of other potential determinants to address the heterogeneity across firms. Finally, we assess the effect of startup funding rounds on incumbent market value in the short-term. Future research could investigate long-term effects of startups by evaluating changes in incumbents' business models.

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