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The financial impact of COVID-19: Evidence from an event study of global hospitality firms

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ABSTRACT
This paper examines the daily abnormal stock price returns of a sample of 154 publicly-traded hospitality firms from 23 different countries representing over $400 billion in combined market capitalization around the time that COVID-19 was first viewed by stock market participants as a major—possibly even existential—threat. The findings of the study suggest that, financially, hotels performed better than restaurants, which themselves performed better than casinos. These findings are consistent with medical recommendations concerning the relative safety of various hospitality-related activities and, therefore, also with the tenets of financial market efficiency in the hospitality sector. Additional findings suggest that hospitality firms with strong balance sheets and income statements characterized by relatively low leverage ratios, high market value (consistent with a “too big to fail” mentality), and higher price/earnings ratios (implying higher relative profitability) all fared better than smaller, weaker firms. Although, in no case, did Bloomberg’s proprietary environmental, social, and governance (ESG) variable possess any predictive power, variables reflecting cross-country cultural differences support Huynh’s (2020) finding that “individualism” was an important factor in explaining the economic impact of the COVID-19 pandemic on hospitality firms.

1. Introduction

Despite its still-murky origins, one thing is certain: Not since the 1918 “Spanish flu” has a communicable disease so profoundly changed the course of world events. Although, at the time of this writing (February 2021), the world-wide toll resulting from the SARS-CoV-2 coronavirus pandemic (approximately 107 million infections and 2,350,000 deaths) shows encouraging signs of abating, the economic misery cast by its wake is likely unprecedented in the course of human history. Indeed, not even The Great Depression of the 1930s inflicted carnage as deep nor as swiftly as that associated with the disease officially known as COVID-19. Graphical depictions of virtually every measure of US economic activity in the first half of 2020 border on the surreal, almost as if the recording pens had been accidently bumped or suddenly disconnected mid-plot.1

While a few companies (among them Amazon, Moderna, Novavax, Netflix, Walmart, and Zoom) found themselves the unintended beneficiaries of the COVID “new normal,” most firms languished and laid off countless employees; more than a few failed entirely and proceeded to liquidate. A Federal Reserve survey of US small businesses reported that, in total, almost 30 percent had either already

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1 See, e.g., https://i.insider.com/5e85dfc3487c22417f1a6903.
closed or were at significant risk of closure by the end of 2021, taking the livelihoods of many millions of American citizens down with them. And the story was the same in virtually every other developed nation.

Perhaps not surprisingly, no sector of the world economy suffered more from the fallout of the novel coronavirus than the hospitality industry, the importance of which can scarcely be overstated. According to industry statistics, in the US alone, direct employment in the hospitality sector totaled 19,000,000 people prior to the COVID-19 pandemic, making hospitality the country’s largest single industrial sector, substantially eclipsing employment even in healthcare and manufacturing. And almost all of these jobs were lost—at least temporarily—in the darkest days of the pandemic. Clearly, by virtue of its almost total dependence upon discretionary income, travel, and friendly face-to-face contact, the global hospitality industry was never designed to survive in an environment characterized by plunging incomes, prohibitions on non-essential travel (sometimes involving the closure of international borders), compulsory facemasks and the fear of infection from both fellow customers and hospitality employees, and the extraordinary reductions in operational capacities (and, thus, economic efficiencies) mandated by so-called “social distancing.”

While the exact details of the COVID-19 timeline are still being debated, the intense market reaction to the virus-related news is easy to identify. Indeed, on February 20, 2020, the US stock market reached an all-time high. Barely a month later (on March 23, 2020), it had dropped well into bear market territory (down almost 35 percent), with the majority of hospitality firms faring far worse.

In this paper, we examine the daily abnormal stock price returns of a sample of 154 publicly-traded hospitality firms from 23 different countries representing over $400 billion in combined market capitalization around the time that COVID-19 was first viewed by stock market participants as a major—and possibly even an existential—issue. In so doing, we are able to address both the impact of the COVID crisis on the industry as a whole as well as investigate the cross-sectional impact of the pandemic on firms of differing locational, financial, and operational characteristics.

Just what was the overall impact of the COVID-19 crisis on the stock prices of firms in the hospitality industry? Were all hospitality firms equally impacted? Or, were there cross-sectional differences in share price responses depending upon specific and identifiable characteristics of the studied firms? For example, did differences in national culture (i.e., countries noted as being more “individualist” versus more “collectivist” or “compliant”) help explain deviations in hospitality share movements in response to the COVID pandemic? Did the level of a hospitality firm’s prior commitment to the principles of corporate social responsibility (CSR) serve in some way to “inoculate” the companies from the greatest ravages of the pandemic? Obviously, the answers to these and related questions are likely to prove of significant interest to a number of constituencies, ranging from hospitality executives and shareholders, to risk managers and insurers, to academic researchers in various fields of study. They are the questions to which the remainder of this study is specifically addressed.

2. A brief discussion of COVID-19 in the context of the hospitality industry

As remains the case with the “Spanish flu” before it, the exact date and point of origination of the SARS-Cov-2 virus is presently unknown—and controversial. That it first appeared somewhere near Wuhan City in Hubei Province in the People’s Republic of China sometime prior to the end of 2019 seems likely, although alternative theories have been proposed. Whether, as was originally thought, the virus made the jump directly from bats to humans (or involved an intermediate host such as pangolins) is a matter of considerable ongoing research. What is known for certain is that, outside of the confines of Hubei Province, the world at large took little notice of the disease until a widespread outbreak in northern Italy in early February 2020.

The SARS-Cov-2 virus—the causative agent of COVID-19—is just one of a family of coronaviruses, most of which are known to cause mild-to-moderate upper respiratory infections including the common cold. However, two earlier and extremely serious respiratory disease outbreaks (SARS in 2002 and MERS in 2004) are also known to have been caused by closely-related RNA coronaviruses. Named for the crown-shaped glycoprotein spikes that protrude from its surface and attach (“like a key cut for a specific lock”) to
receptors in the cells that line the respiratory tract, the virus is extremely efficient. Current estimates suggest that, uncontrolled, the reproductive number ("R")—that is, the number of secondary infections generated from one infected individual—is thought to be between 2 and 2.5 for SARS-Cov-2, a number considerably higher than the approximately $R = 1.5$ for seasonal influenza. Although several highly-effective vaccines began to be introduced in late 2020, the inherent instability of all RNA viruses has led to the emergence of faster-spreading and potentially even more lethal (and, potentially, vaccine evading) variants. However, as is the case with influenza, and a matter of considerable import to the hospitality industry, the $R$ value for COVID-19 is almost certainly dramatically higher under the close proximity conditions typical of hospitality settings such as hotels, restaurants, cruise ships, theme parks, and casinos. Indeed, it was the possibility that the virus’s high reproductive number would lead to high morbidity in the general population, combined with a still unknown, but apparently high mortality rate (possibly approaching 5 percent for individuals in the key 65+ hospitality demographic), that proved so catastrophic for firms in the hospitality industry.

The first real evidence of the hospitality nightmare to come involved the case of Princess Cruises’ Diamond Princess. The ship made headlines worldwide after it was quarantined and refused anchorage by the Japanese Health Authority in early February, trapping onboard nearly 3800 guests and staff after one of its passengers tested positive for COVID-19. An almost month-long offshore lockdown of the vessel followed, during which over 700 people were infected and 14 died. But the case of the Diamond Princess was by no means unique. Indeed, less than a week later, the 4000 passengers and crew on Dream Cruises’ World Dream were quarantined in Hong Kong’s Victoria Harbour; other shipboard quarantines quickly followed.

But the dominoes had just begun to fall. On March 12, the US government banned all non-essential travel to 26 European countries. The next day, President Donald Trump declared a national state of emergency due to the coronavirus pandemic. Nevada casinos were ordered closed on March 26. By early April—almost exactly coincident with the enactment of a host of unprecedented economic stimulus programs around the globe—virtually every “non-essential” business entity in the Western World had been temporarily shuttered in a series of governmentally-mandated efforts designed to “flatten the curve” and slow the spread of the virus. There is no question but that hospitality firms bore much of the brunt of the carnage.

While the debates on whether the worldwide economic shutdown in response to COVID-19 were wise or ineffectual and unduly crippling—and whether the recent declines in COVID-19 cases suggest the pandemic is already fading or are merely at the prelude of a much-feared “second wave”—are just beginning, for thousands of hospitality companies, millions of hospitality workers, and hundreds of millions of hospitality patrons around the world, the end of the COVID-19 pandemic cannot come soon enough.

3. Previous results

Given the hospitality industry’s import to both human flourishing and the global economy—calculated by the World Travel and Tourism Council to represent almost 10 percent of world GDP—prior literature on the hospitality industry is extensive. For the purposes of this study, however, research by Dewally et al. (2013); Boz et al. (2015); Mar-Molinero et al. (2017); Paek et al. (2013); Singal (2014); Ionescu et al. (2019), and Goodell and Huynh (2020) is particularly relevant and discussed in detail below.

In their work, Dewally et al. (2013) examine the financial performance of hospitality companies around the time of the 2008 financial crisis. Employing data over the 2000–2010 time period, the authors document clear evidence of significant differences in the valuation responses of different hospitality subsectors in response to the same liquidity crisis. Specifically, the authors found that the restaurant subsector performed significantly better than the casino or hotel sub-sectors during the 2008 crisis and that the most capital-intensive hospitality firms responded to the stresses of the liquidity crisis by both increasing their financial leverage and depleting their cash holdings. All of these results are consistent with the anecdotal evidence presented above that theme parks, hotels, airlines, and cruise companies experienced very different (though consistently negative) declines in stock prices as the COVID-19 pandemic progressed.

In a more recent work, Mar-Molinero et al. (2017) analyze the determinants of the systematic (i.e., “beta” or “market”) risk for European hospitality firms before and after the 2008 financial crisis and document clear differences in the return-generating processes for these companies over the two time periods under study (ranging from 2003 to 2013). For example, while failing to document any statistically significant relationships over the earliest time period (2003–2007), over the years between 2008 and 2013, the authors document that growth, productivity (measured via several metrics), liquidity, and firm size all were correlated with statistically significant differences in systematic risk. In a related work, Boz et al. (2015) analyze European food service and accommodation companies from 2003 to 2011 in an effort to identify variables capable of explaining the cross-sectional differences in systematic risk between the firms. Interestingly, while the size of European tourism firms (measured by total assets) is the only accounting factor shown to influence systematic risk, three macroeconomic factors, namely, European GDP growth, the exchange rate between the Euro and the U.S. dollar, and the profitability of the Dow Jones industrial average had high explanatory power in predicting cross-sectional differences in systematic risk.

A recent stream of research in business and economics concerns the impact of environmental, social, and governance (ESG) and corporate social responsibility (CSR) factors on stock market returns and accounting profitability, and the literature on the hospitality

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10 For a thorough, non-technical description of the disease process, see https://www.fredhutch.org/en/news/center-news/2020/04/covid19-virus-spike-structure.html.

11 https://www.cdc.gov/coronavirus/2019-ncov/transmission/variant.html

12 See, e.g., https://www.ship-technology.com/features/cruise-industry-coronavirus.

13 See, e.g., https://wttc.org/Research/Economic-Impact.
industry has been no exception. For example, Paek et al. (2013) study the relationships between levels of ownership shares by managers and CSR performances in five sub-dimensions using panel data of publicly-traded U.S. hospitality firms. Interestingly, the results indicate that managerial ownership has a significant negative relationship with employee relations and a weakly negative one with diversity, while having an insignificant impact on the community, environmental, and product dimensions. Singal (2014) examines the impact of CSR investments by family- and non-family-owned hospitality firms in order to ascertain whether family-affiliated enterprises invest more (or less) in socially-responsible activities and procedures. Although the author’s results are consistent with the hypothesis that family firms are financially stronger, such firms do not actually appear to invest more in CSR than non-family firms (controlling for differences in financial strength). In addition, the results suggest family firms invest more in mitigating social concerns than in taking positive steps to enhance their CSR ratings. In a more recent work, Ionescu et al. (2019) investigate the relationship between awarded ESG scores for 73 global hospitality firms and observed equity market returns. The authors’ findings indicate that whereas a travel and tourism firm’s overall ESG score is an important explanatory variable, the governance (“G”) aspect dominates both the environmental and social factors, at least over the time period studied (2010–2015). Finally, in a fascinating article, Goodell and Huynh (2020) analyze the stock market trading behavior of US legislators in the early months of the COVID-19 pandemic. The authors document clear instances of legislators “trading ahead of the market” by buying (selling) shares of companies that would be expected to rise (fall) as the pandemic spread, and in particular by buying shares of pharmaceutical companies and selling those in the hospitality industry. Very recently, Popkova et al. (2020) present an analysis of CSR investments between developed (OECD) and less-developed (BRICS) countries in the context of a COVID-19 economy. The authors conclude that investments in CSR—particularly those that enable the transition to more remote-based business models, will help enable businesses in less developed countries to experience faster rates of economic growth (in general) and (more specifically) to an accelerated recovery from the COVID-19 pandemic.

In an important study in this journal, Chin et al. (2013) analyze the impact of the 2007 global financial crisis on the changes in efficiency, resource allocation, and future operational strategies of Taiwan’s international tourist hotels. The authors’ findings are consistent with the hypothesis that although hotel managers attempted to respond to the crisis environment, there remained room for improvement in terms of the availability of slack in operating inputs (including the number of operating guest rooms, the number of guest relations and housekeeping employees, and the resources committed to food and beverage services). Feridun (2011) employs an autoregressive distributed lag (ARDL) bounds test on the Turkish hospitality industry to a “pandemic” crisis of a very different sort (political terrorism) and concludes that “... tourism is in a long-run equilibrium level relationship with terrorism.” The study further concludes that, although, as expected, the Turkish correlation between tourism and terrorism is negative (i.e., higher levels of terrorism are associated with lower levels of tourism) it is also causal (with increases in terrorism leading decreases in tourism).

Finally, while not specific to the hospitality industry, a large number of very recent studies have appeared in the literature on the impact of the COVID-19 pandemic on financial markets. Among these are papers by Al-Awadhi et al. (2020); Ashraf (2020); Baker et al. (2020); Krieger et al., 2020; Mazur et al. (2020); Popkova et al. (2020), and Schell et al. (2020). Al-Awadhi et al. (2020) and Ashraf (2020) examine stock market reactions to changes in the number of COVID-19 cases in China (Al-Awadhi et al.) and 64 different countries (Ashraf), respectively, and document that changes in share returns in response to published news reports of the number of COVID victims were both extremely rapid and highly negatively correlated, with particularly strong reactions observed in the earliest days of the pandemic. Mazur et al. (2020) investigate US share price changes by industry, noting that hospitality shares, in particular, fell dramatically. An analysis of 8 K and DEF14A filings of the poorest performing companies revealed an increase in senior executive departures, remuneration cuts, and (most surprisingly) newly-approved cash bonuses and salary increases in an effort to retain particularly valued managers. Baker et al. (2020) put the stock market’s responses to COVID-19 in historical context by comparing and contrasting the stock market’s responses to the advent of the SARS-CoV-2 virus with the reactions to influenza outbreaks in 1918 (the “Spanish flu”), 1957 (the “Asian flu”), and 1968 (the “Hong Kong flu”). The authors conclude that “No previous infectious disease outbreak, including the Spanish Flu, has affected the stock market as forcefully as the COVID-19 pandemic” and that “... government restrictions on commercial activity and voluntary social distancing, operating with powerful effects in a service-oriented economy, are the main reasons the U.S. stock market reacted so much more forcefully to COVID-19 than to previous pandemics...” Schell et al. (2020) present a related analysis by examining the reactions of 26 world stock market indexes to all six Public Health Risk Emergency of International Concern (PHEIC) announcements issued since the establishment of the program by the World Health Organization in 2005 and conclude, with respect to the COVID-19 pandemic, that “…this time is indeed different.” Finally, Krieger et al., (2020) examine the changes in payout policies observed for US firms during the pandemic and conclude that no recent prior event (including the 2008 financial crisis) led to such profound reductions (and omissions) in cash dividends.

4. Data

Construction of the initial sample in this study exactly follows Paek et al. and includes the totality of all publicly-traded companies (regardless of country of origin) listed on Bloomberg with SIC codes of 5812, 7011, or 7990, representing restaurants, hotels, and casinos, respectively. Although firms lacking data on the specific independent variables necessary to perform a thorough analysis (discussed in detail below) are eliminated from further consideration, the final COVID-19 hospitality sample is both quite large and

14 Indeed, of the six diseases included in the study, only Covid-19 had a significant negative effect on stock markets lasting at least 30 days.
internationally diverse.\textsuperscript{15} Of the 154 sample firms from 23 different countries, 80, 41, and 33 companies represent the restaurant, hotel, and casino sectors of the hospitality industry, respectively. A list of the countries included in the sample and the number of firms from each country is reported in Table 1. The mean market capitalization of the studied firms was $2.7 billion.

Given that the present study’s focus is events that occurred in the first quarter of calendar year 2020, all accounting variables collected from Bloomberg are year-end 2019 values. Changes in stock prices necessary to calculate stock market returns, on the other hand, are contemporaneous to the COVID pandemic under study.\textsuperscript{16} In particular, firm-level data including daily stock returns, ESG (from Bloomberg’s proprietary ESG disclosure metric), ROA (return-on-assets, defined as 2019 net income divided by 2020 total assets), MARKET CAP (defined as the natural log of total equity market capitalization), DEBT-TO-EQUITY ratio (defined as total debt divided by the book value of equity), REV_GROWTH (defined as the year-over-year revenue growth from 2018 to 2019), VOLATILITY (defined as the annualized standard deviation of daily stock returns over calendar year 2019), RETURN which is the cumulative raw return for calendar year 2019, and PE which is the price-to-earnings ratio as of December 31, 2019. Full variable descriptions and sources are reported in Appendix A.

As noted in the introduction, the time period from February 21, 2020 to March 31, 2020 was selected for analysis of the impact of the COVID-19 crisis on the sampled hospitality firms. This time period is similar to other COVID research such as Ashraf (2020) which uses the period January 22, 2020 to April 17, 2020. Whereas the “typical” event study focuses on stock price changes in response to the stimuli of specific corporate news or economy-wide events (such as stock splits, tax law changes, or, more recently in the case of hospitality firms, on-premises homicides\textsuperscript{15}), the veritable tsunami of global pandemic-related news and developments over the first quarter of 2020 made the selection of any single event date or short event window almost arbitrary. Instead, the present analysis simply followed the market itself to generate the examined window. As of February 20, 2020, there was no visible consideration of COVID-19 in the overall stock market. This perspective changed quite quickly, however, with March 2020 alone witnessing four of the fifteen largest single day drops in U.S. stock market history. Given that the stock market began to rally in early April (probably as a consequence of governmental support efforts) it is clear in hindsight that the financial market gloom resulting from the virus pandemic is well-captured by the chosen event window. While the analysis focuses primarily on the entire event period, two different windows (from the start of the pandemic on February 21 to the market low on March 13 and from the market low to the end of the period on March 31) were separately analyzed in recognition of the variety of pandemic developments and stimulus activities that took place over the course of the complete event window. The raw returns of both the hospitality industry firms in our sample and the S&P 500 are displayed in Fig. 1.

5. Methodology

A detailed description of the mathematical procedures involved in the calculation of what are known as “abnormal stock returns” via the “market model” is beyond the scope of this study and is available elsewhere (see, e.g., Brown and Warner, 1985). In general, however, the technique involves modeling how a given hospitality firm’s stock would have been expected to perform vis-à-vis an index of overall stock prices in the absence of a specific, economically significant event—in this case, the COVID-19 pandemic. Once modeled, these day-to-day stock market expectations can be subtracted from actual ex post stock returns and then summed (“cumulated”) across various “event windows” to arrive at reasoned estimates of the economic value of the pandemic on each of the sample firms over the time periods under study. Originally developed in the field of finance, similar analyses of event-induced stock market impacts have been successfully employed in many fields of study, including the economics of hospitality-related events (e.g., Mauck et al., 2020).

In the present case, stock market expectations in the pre-COVID period were estimated over the period from February 1, 2019 to January 31, 2020 (250 trading days). As noted above, although cumulative abnormal returns for each hospitality firm (CAR\textsubscript{i}) were calculated for event windows of varying length, the abnormal return across the full studied event window (February 21, 2020 to March 31, 2020) was utilized as the dependent variable in all performed cross-sectional regressions. In all specifications, indicator variables for the firm country of origin and robust standard errors are utilized. This regression takes the form of:

\[
\text{CAR}_i = \text{ESG}_i + \text{ROA}_i + \text{MARKET CAP}_i + \text{DEBT-TO-EQUITY}_i + \text{REV}_i + \text{VOLATILITY}_i + \text{RETURN}_i + \text{PE}_i + \text{DUMMIES}_i + \epsilon_i
\]

where \text{ESG}_i is Bloomberg’s proprietary ESG disclosure score, \text{ROA}_i is the return-on-assets (net income divided by total assets), \text{MARKET CAP}_i is the natural log of market capitalization, \text{DEBT-TO-EQUITY}_i is each firm’s total debt divided by the book value of equity, \text{REV}_i is the year-over-year revenue growth from 2018 to 2019, \text{VOLATILITY}_i is the annualized standard deviation of daily returns for calendar year 2019, \text{RETURN}_i is the cumulative raw return (unadjusted for market movements) for calendar year 2019, \text{PE}_i is the price-to-earnings ratio for each hospitality firm as of December 31, 2019, \text{DUMMIES}_i are indicator variables for industry sector and/or country of origin, and \epsilon_i is the error term. In addition to the firm-specific metrics discussed above, four national variables were

\textsuperscript{15} By way of comparison, it should be noted that Su and Chen (2020); Ionescu et al. (2019), and Singal (2014) analyze, respectively, just 18, 73, and 60 hospitality firms. Thus, the present sample of 154 firms exceeds the total number of the firms included in these three prior studies (151).

\textsuperscript{16} The relationship between daily “stock returns” (or, more formally, the “holding period return”) and stock “prices” is a simple one and merely involves calculating the percentage gain or loss one would have experienced had they purchased a particular stock at the close of trading on, say, Monday and then sold it the very next day at the close of trading on Tuesday.

\textsuperscript{17} See, e.g., Mauck et al. (2020).
also included—three specifically relating to Hofstede’s cultural dimensions (see, e.g., Hofstede and Bond, 1984) with the fourth being the number of COVID cases reported in each country reported on the Johns Hopkins Coronavirus Dashboard as of the end of the sample period (March 31, 2020). The use of Hofstede’s cultural dimensions follows Huynh (2020), who notes that observable differences in national culture matter in mitigating the spread of COVID-19. In particular, Hofstede’s power distances index (PDI), individualism versus collectivism index (IDV), and uncertainty avoidance index (UAI) attempt to measure a national population’s overall respect for hierarchy, toleration of differences and individual achievement, and fear of uncertain and/or unstructured situations, respectively. Country indicators are included in all specifications in an effort to control for national-level factors not explicitly modeled. The ultimate objective of the analysis is to ascertain reasoned estimates of the overall damage inflicted by the viral pandemic on hospitality companies, as well as to identify some of the factors which explain the cross-sectional variability of hospitality shares in response to the same global crisis. Armed with such information, hospitality managers may find themselves better able to position their firms for success—if not survival—when faced with the types of catastrophically similar events almost certainly likely to occur in the future as a result of the continued growth of the hospitality industry on a perpetually shrinking globe.

6. Empirical results

Panel A of Table 2 presents a summary of the risk- and market-adjusted average daily abnormal returns and associated test statistics.

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**Table 1**

| Country       | N  | Percent |
|---------------|----|---------|
| Japan         | 62 | 40.26   |
| US            | 28 | 18.18   |
| Australia     | 10 | 6.49    |
| China         | 8  | 5.19    |
| Great Britain | 7  | 4.55    |
| India         | 7  | 4.55    |
| Hong Kong     | 6  | 3.9     |
| Malaysia      | 4  | 2.6     |
| South Africa  | 4  | 2.6     |
| Macao         | 2  | 1.3     |
| Mauritius     | 2  | 1.3     |
| Sweden        | 2  | 1.3     |
| Taiwan        | 2  | 1.3     |
| Canada        | 1  | 0.65    |
| Estonia       | 1  | 0.65    |
| France        | 1  | 0.65    |
| Ireland       | 1  | 0.65    |
| Republic of Korea | 1 | 0.65 |
| Luxembourg    | 1  | 0.65    |
| Mexico        | 1  | 0.65    |
| New Zealand   | 1  | 0.65    |
| Singapore     | 1  | 0.65    |
| Thailand      | 1  | 0.65    |
| **Total**     | 154| 100     |

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Fig. 1. Cumulative raw returns of hospitality industry stocks vs. cumulative S&P 500 index returns.

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18 https://coronavirus.jhu.edu/
for the full sample of 154 hospitality firms over the time interval from one day after the stock market peak (February 21, 2020) to March 31, 2020. As noted above, this time period likely represents the greatest uncertainties regarding the extent, duration, and severity of the COVID-19 epidemic on the studied hospitality companies. The cumulative abnormal returns for the hospitality firms in our sample over this period are displayed in Fig. 2.

It is interesting to note that six of the 16 days with significant abnormal returns show positive movements in hospitality stocks while the S&P 500 was falling and seven of the 16 days show negative movements when the S&P 500 was rising. This intriguing result strongly suggests that stock market participants viewed the hospitality sector differently than other sectors during this period of time.

The interval from March 13 to March 17 (inclusive) was the time period with the greatest disparity between the S&P500 and the average abnormal returns of the hospitality sector stocks. Recall, it was during this period that stock market investors found themselves forced to digest just the second declared National State of Emergency for reasons of public health in history—19 as well as a ban on non-essential travel from 26 European countries. Not surprisingly, neither of these events was well-received by hospitality investors.

Panel B of Table 2 presents market- and risk-adjusted cumulative abnormal returns for the hospitality sample firms over three event windows of varying length. The first window (February 21, 2020 to March 31, 2020) shows a total adjusted cumulative abnormal return of −17.56 % over the entire event period. Given that the S&P 500 index fell by 23.38 % over the same interval and that cumulative abnormal returns illustrate changes net of this loss, it is clear that, overall, the sampled hospitality firms suffered wealth declines far in excess of that of those registered by the overall stock market. The second interval (February 21, 2020 to March 13, 2020) shows the cumulative abnormal returns from the day after the market peak to the first trading day following the US declaration of a national state of emergency. The CAR for this interim period was -20.75 % net of the 19.6 % decline of the S&P 500. In other words, over an interval of just three weeks, the studied hospitality shares dropped some 40 % in overall value, erasing approximately $160 billion in hospitality investor wealth. Interestingly, over the final two week interval examined (March 16, 2020 to March 31, 2020), the

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19 The first being President Barack Obama’s declaration concerning the H1N1 “swine flu” epidemic October 24, 2009—an event that paled in comparison with dislocations associated with the COVID pandemic.
performance of the sampled hospitality stocks essentially tracked that of the S&P 500 index (which dropped just 4.7% over this interval), as the noted 3.19% adjusted rise in hospitality shares over this window was insignificantly different from zero. Overall, the results presented in Table 2 make it quite clear that the COVID-19 pandemic exacted both an economically and statistically significant toll on hospitality equity investors.

Panels A and B of Table 3 show tests for the same intervals as in Table 2 for bifurcated samples of Japanese and US hospitality firms. While the overall sample consisted of 154 firms representing 23 countries, the only two countries with a sufficient number of firms to conduct a statistically reliable analysis are Japan (with 62 firms) and the United States (represented by 28 companies). Although, directionally, the results are obviously similar to those presented in Table 2, comparison of the results in Panels A and B show that, in all three intervals, the magnitude of the abnormal returns are quite different, with hospitality firms in the US proving much more sensitive to the COVID-19 pandemic than those in Japan. Over the full five-week event window (February 21, 2020 to March 31, 2020), US hospitality companies under-performed their Japanese counterparts by almost 20 percent. A two-sample t-test of these abnormal return differences is significant at the 1% level. It is not difficult to conjecture that this difference is due to the remarkably different viral environments of the two countries. Indeed, even as early as March it was clear that the US would be severely affected by the pandemic, whereas Japan might not. Even today, this difference is readily apparent in the total viral caseload of the two countries, with US infections outnumbering those in Japan by over 150 to 1.20 It is because of these global differences in hospitality equity responses to the viral pandemic that country indicators were employed as independent variables in much of the analysis that follows.

To further delve into the potential drivers of hospitality returns in response to the COVID crisis, cumulative abnormal returns (CAR) were calculated by hospitality industry segment for the same three calendar intervals discussed in Table 3 above. These results are presented in Table 4, with Panels A, B, and C representing the restaurant, hotel, and casino sectors, respectively. Considered over the entirety of the event window, there is little question but that casino investors were hit the hardest overall and recovered the least (over the final two weeks examined), followed by restaurants and hotels. Interestingly, these results are completely consistent with a graphical chart released by the Texas Medical Association showing the relative risks of contracting COVID-19 (rated on a 1–9 scale) associated with various common activities.21 Specifically, a two-night stay in a hotel was rated as representing a “moderate to low” risk (with a numerical score of 4), eating indoors at a restaurant was classified as a “moderate to high” risk activity (with a score of 7), and, whereas “visiting a casino” was not specifically rated, closely related activities such as “eating at a buffet,” “going to a bar,” or “attending a religious service with 500+ worshippers” were classified as “high risk” activities (with a score of either 8 or 9). Further, although virtually all US-based casinos (and many in other countries) closed during the March 2020 pandemic response, many restaurants remained open for take-out, and fewer than 10% of US hotels (and a significantly smaller number of hotels worldwide) closed at all. Viewed in this light, the results presented in Table 4 represent striking evidence in support of the rationality of hospitality investors in the face of completely unanticipated shifts in consumer preferences and subsequent market demand.

Panel A of Table 5 presents basic descriptive statistics for the independent variables included in the regression analysis to follow, while Panel B reproduces the correlation matrix between each of these variables. As shown in Panel B, when viewed in isolation, the cumulative abnormal return (CAR) over the full event window (February 21, 2020 to March 31, 2020) is slightly positively correlated with the price/earnings ratio (PE), market value (MARKET CAP), return on assets (ROA), and cumulative unadjusted market returns over the pre-event window (RETURN). It is slightly negatively correlated with Bloomberg’s proprietary environmental, social, and governance (ESG) metric, leverage (DEBT-TO-EQUITY), revenue growth (REV_GROWTH), and share price volatility (VOLATILITY). The fact that ESG is positively correlated with return on assets and market value supports the reasonable hypothesis that larger and

20 As of July 14, 2020, confirmed Japanese COVID cases number just 22,431 according to the Johns Hopkins Corona Virus Resource Center. US cases, on the other hand, crossed 3,400,000. Stated somewhat differently, the US has had over six times as many COVID-19 deaths as Japan has COVID infections.

21 See, e.g., https://twitter.com/texmed/status/1279046501054980096/photo/1.
more profitable hospitality companies are more likely to invest resources in ESG practices and policies. Given the relatively high correlation between market value and other explanatory variables, we utilize an orthogonalized market value in all regressions.

Table 6 presents the results of six multiple regression models using the cumulative abnormal returns (CAR) over the entire event window as the dependent variable. The models differ with respect to the presence or absence of the price/earnings ratio (PE), national variables (including cultural metrics and COVID cases), and/or industry sector and country of origin dummy indicators.\textsuperscript{22} The $R^2$ are quite high for cross-sectional abnormal returns regressions, and show that between 34% and 51% of the variability of the individual hospitality firm abnormal return levels are explained by the included independent variables. Not surprisingly, all six regressions are also highly significant ($p < .0001$).

As show in the table, the leverage ratio (DEBT-TO-EQUITY) is negative and statistically significant in all six regressions. Return on assets (ROA) and market value (MARKET CAP) are positive and statistically significant in all regressions save for those including country indicator variables. In all three estimations where the price/earnings ratio (PE) is included, it is both positive and statistically significant.

The negative relationship between DEBT-TO-EQUITY and the noted share price declines is consistent with prudent managerial principles and suggests that hospitality firms with lower debt levels were interpreted by investors as more likely to survive unanticipated, catastrophic events than firms with the more aggressive debt levels typically associated with contemporary hospitality practice.\textsuperscript{23} Similarly, the positive relationships between the return on assets (ROA), market capitalization (MARKET CAP), and the price/earnings ratio (PE) and COVID-related abnormal share returns are consistent with the reasonable hypothesis that larger, more profitable firms and near-term survival are likely positively correlated—a “flight to safety” as it were.

\textsuperscript{22} The number of firms in the regression drops from 151 to 128 due to the omission of firms with negative P/E ratios.

\textsuperscript{23} Hotel company debt levels had risen by 14% (to over $300 billion) in the two years just prior to the outbreak of COVID crisis. See, e.g., https://www.wsj.com/articles/debt-poses-threat-to-some-hotel-owners-as-markets-slide-11583838153.

### Table 3
Cumulative abnormal returns (CAR) for Japanese and US hospitality firms for selected intervals.

| Panel A: Japan                  | Date Range          | CAR (%) | N  |
|--------------------------------|---------------------|---------|----|
| 2/21/2020 to 3/31/2020         | -10.68**            | 62      |
| 2/21/2020 to 3/13/2020         | -24.26**            | 62      |
| 3/16/2020 to 3/31/2020         | 13.58**             | 62      |

| Panel B: United States        | Date Range          | CAR (%) | N  |
|--------------------------------|---------------------|---------|----|
| 2/21/2020 to 3/31/2020         | -29.67**            | 28      |
| 2/21/2020 to 3/13/2020         | -37.43**            | 28      |
| 3/16/2020 to 3/31/2020         | 7.75*               | 28      |

** and * denote significance at the 1% and 5% levels, respectively.

### Table 4
Cumulative abnormal returns (CAR) by hospitality sector.

| Panel A: Restaurants          | Date Range          | CAR (%) | N |
|-------------------------------|---------------------|---------|---|
| 2/21/2020 to 3/31/2020        | -18.34**            | 80      |
| 2/21/2020 to 3/13/2020        | -26.20**            | 80      |
| 3/16/2020 to 3/31/2020        | 7.96**              | 80      |

| Panel B: Hotels               | Date Range          | CAR (%) | N |
|-------------------------------|---------------------|---------|---|
| 2/21/2020 to 3/31/2020        | -12.26              | 41      |
| 2/21/2020 to 3/13/2020        | -10.48**            | 41      |
| 3/16/2020 to 3/31/2020        | -1.78               | 41      |

| Panel C: Casinos              | Date Range          | CAR (%) | N |
|-------------------------------|---------------------|---------|---|
| 2/21/2020 to 3/31/2020        | -22.26**            | 33      |
| 2/21/2020 to 3/13/2020        | -20.04**            | 33      |
| 3/16/2020 to 3/31/2020        | -2.22               | 33      |

** and * denote significance at the 1% and 5% levels, respectively.
Table 5
Descriptive statistics of the hospitality companies included in the sample.

| VARIABLE          | N  | MEAN | SD   | SKEW | KURTOSIS | MIN | MAX  |
|-------------------|----|------|------|------|----------|-----|------|
| CUMULATIVE AR     | 154| -17.56| 30.1 | 1.81 | 17.12    | -95.95 | 184.1 |
| ESG               | 154| 23.13 | 10.79| 1.03 | 3.39     | 2.066| 55.79 |
| PE                | 130| 52.38 | 86.97| 3.8  | 17.83    | 5.699| 520.3 |
| MARKET CAP        | 153| 2,658,000,000 | 5,402,000,000 | 5   | 28.19    | 887,344 | 43,250,000,000 |
| DEBT-TO-EQUITY    | 154| 44.17 | 29.8 | 0.19 | 1.96     | 0    | 100  |
| ROA               | 154| 4.183 | 13.52| 3.77 | 42.45    | -51.29| 122.9 |
| REV_GROWTH        | 152| 4.938 | 14.19| 0.79 | 20.07    | -67.87| 58.83 |
| RETURN            | 153| 11.47 | 32.18| 0.65 | 10.35    | -99.33| 110  |
| VOLATILITY        | 154| 38.08 | 55.87| 6.54 | 47.2     | 9.009| 467.8 |

Panel B: Correlation Table

|                    | (1)  | (2)  | (3)  | (4)  | (5)  | (6)  |
|--------------------|------|------|------|------|------|------|
| (1) CUMULATIVE AR  | 1.000|      |      |      |      |      |
| (2) ESG            | -0.037|      |      |      |      |      |
| (3) PE             | 0.184| -0.192| 1.000|      |      |      |
| (4) MARKET CAP     | 0.046| 0.508| -0.180| 1.000|      |      |
| (5) DEBT-TO-EQUITY| -0.342| 0.050| 0.003| 0.284| 1.000|      |
| (6) ROA            | 0.074| 0.135| -0.248| 0.340| 0.028| 1.000|
| (7) REV_GROWTH     | -0.156| 0.127| -0.125| 0.270| 0.311| -0.050|
| (8) RETURN         | 0.051| -0.000| -0.010| 0.276| 0.191| 0.005| 0.229| 1.000|
| (9) VOLATILITY     | -0.286| -0.045| -0.167| -0.052| 0.197| 0.008| 0.178| 0.009| 1.000|

*Bold denotes that correlation is significant at a minimum of the 10 % level.

Table 6
CAR Regression Results.

|                      | (1)   | (2)    | (3)   | (4)   | (5)   | (6)   |
|----------------------|-------|--------|-------|-------|-------|-------|
| ESG                  | -0.311| -0.077| 0.041 | -0.091| -0.094| -0.051|
|                      | (0.203)| (0.175)| (0.212)| (0.235)| (0.190)| (0.255)|
| ROA                  | 0.561**| 0.517*| 0.338**| 0.604***| 0.585*| 0.254|
|                      | (0.222)| (0.306)| (0.170)| (0.217)| (0.316)| (0.351)|
| MARKET CAP           | 0.121***| 2.892*| 0.050| 0.151***| 3.834**| 0.052|
|                      | (0.046)| (1.587)| (0.050)| (0.046)| (1.786)| (0.053)|
| DEBT-TO-EQUITY       | -0.333***| -0.289***| -0.120*| -0.170**| -0.237***| -0.164*|
|                      | (0.068)| (0.071)| (0.070)| (0.080)| (0.089)| (0.091)|
| REV_GROWTH           | -0.066| -0.109| -0.260*| -0.026| -0.093| -0.368**|
|                      | (0.149)| (0.161)| (0.144)| (0.142)| (0.163)| (0.173)|
| VOLATILITY           | 0.369***| -0.457**| -0.089| 0.430***| -0.346| -0.513***|
|                      | (0.047)| (0.190)| (0.061)| (0.047)| (0.214)| (0.191)|
| RETURN               | -0.013| 0.080| 0.046| 0.023| 0.096| 0.088|
|                      | (0.065)| (0.069)| (0.062)| (0.066)| (0.074)| (0.069)|
| PE                   | 0.048**| 0.049***| 0.046**| 0.046**| 0.024| (0.025)|
|                      | (0.022)| (0.043)| (0.022)| (0.022)|       |       |
| PDI                  | -0.266|       |       |       |       | -0.317|
|                      |       |       |       |       |       | -0.193|
| IDV                  | -0.651***|       |       |       |       | -0.727***|
|                      |       |       |       |       |       | (0.183)|
| UAI                  | 0.043|       |       |       |       | 0.016|
|                      |       |       |       |       |       | (0.187)|
| COVID CASES          | 0.049|       |       |       |       | -0.016|
|                      |       |       |       |       |       | (0.129)|
| RESTAURANTS          | -5.130| 1.748|       |       |       | 2826|
|                      | (4.569)| (4.736)|       |       |       | (4.376)|
| CASINOS              | -1.441| 3.705|       |       |       | 1.233|
|                      | (5.800)| (5.831)|       |       |       | (5.915)|
| JAPAN                | 17.912***| 5.476|       |       |       | 3.177|
|                      | (5.854)| (6.585)|       |       |       | (10.342)|
| US                   | -10.632| -4.784|       |       |       | -5.713|
|                      | (8.990)| (9.136)|       |       |       | (8.339)|
| Country Indicators   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Constant             | -9.839| 2.299| 33.731| -27.583***| -6.588| 63.474**|
|                      | (6.483)| (7.899)| (23.090)| (9.591)| (7.567)| (25.427)|
| Observations         | 151   | 128   | 121   | 151   | 128   | 102   |
| R-squared            | 0.438| 0.340| 0.355| 0.507| 0.354| 0.452|

***, **, and * denote significance at the 1%, 5%, and 10 % levels, respectively. Standard errors in parentheses.
In results that are interesting only in absence, Bloomberg’s proprietary environmental, social, and governance (ESG) metric is statistically unrelated (and negative) to the COVID crisis share decreases in all four regressions. Whatever value ESG investments are thought to provide to the hospitality industry, the present results suggest that—in times of serious economic dislocation, at least—equity market investors appear to assess the health (indeed, possibly even the viability) of hospitality companies through the use of more traditional financial metrics.

While several aspects of individual firm financial management were found to be statistically correlated with the abnormal returns registered over the event windows examined, Huynh (2020) suggests it is also important to consider the potential influence of more traditional financial metrics.


equity market investors appear to assess the health (indeed, possibly even the—

interestingly, only one variable—IDV (Hofstede’s metric for “individualism”)—is significant, but it enters with the expected negative sign, implying that the share prices of countries whose citizens exhibit higher levels of “individualism” (a factor surely inversely correlated with the tendency to follow mask and social distancing guidelines”) fared significantly worse than countries with a more “collectivist” or “compliant” citizenry. The fact that the number of COVID cases in each country was insignificant is not surprising given the study’s emphasis on the earlier stages of the pandemic when large differences in infections, hospital caseloads, and fatalities had yet to fully emerge.

In unreported checks on robustness, a number of alternative dependent variable specifications were also employed. Specifically, substituting cumulative abnormal returns generated over event windows from February 21 st to March 13th, 2020, or February 21 st to March 23rd, 2020 resulted in findings qualitatively consistent with those using the entire event window (February 21 to March 31, 2020). Further, although removing firms headquartered in Japan and the US (the countries with the largest representation in the full sample) resulted in insignificance for the firm-level variables, Hofstede and Bond’s (1984) IDV remains negative and significant, underscoring Huynh’s (2020) conjecture that “individualism” is an important factor in helping to solve the COVID-19 puzzle.

7. Conclusion

In a July 7, 2017 article that seems eerily prescient in retrospect, HospitalityNet.org—a hospitality trade organization—reported on a study by hospitality education leader EHL entitled, “What will the hospitality industry look like in 2030?” The article’s Number 2 point suggested that the industry’s “vulnerability” was on the rise:

The hospitality industry’s vulnerability to a variety of events could increase, which might transform hospitality into a fragile business. Among the most dangerous threats to the sector are climate change, safety and security issues, wild card events (e.g. SARS) as well as unprecedented migration streams.26

There would seem to be little doubt but that the COVID-19 pandemic of 2020 qualifies as one of the wildest of possible “wild card events.” Although a complete accounting may never be possible, it seems quite likely that the hospitality sector (and closely-associated industries such as airlines, cruise ships, theme parks, sporting teams, and concerts and theaters) suffered more economic damage from the viral onslaught than any other. Indeed, by attacking the very foundation of the hospitality industry—guest safety—the virus is leaving scars that are unlikely to fade for several years to come. In a June 10, 2020 white paper, leading managerial consultants McKinsey and Company “…suggests that recovery to pre-COVID-19 levels could take until 2023—or later.”27 In a July 17, 2020 press conference, US Treasury Secretary Steven Mnuchin specifically noted that the next phase of the government’s pandemic relief should be for “…those that are especially hard hit, such as restaurants, hotels and other travel and hospitality businesses.”28 Ultimately, how quickly business recovers is almost entirely beyond the control of the hospitality industry itself. While more diligent disinfection practices, masks, and social distancing are potentially helpful at reducing the spread of the disease and in “flattening the curve,” it seems likely that a full “return to normalcy” will require the development of effective treatments and/or vaccines and/or for the virus to simply infect a sufficiently large number of victims to convince hospitality patrons of their safety via so-called “herd immunity.” But although progress is being made, that is still in the future.

The present study, by analyzing the impact of the COVID pandemic on 154 hospitality companies from 23 countries, sheds light on investor perceptions of the factors that were most closely correlated with share price performance during the darkest days of the crisis (February 21, 2020 to March 31, 2020). Overall, adjusted for risk and market movements, the studied hospitality shares dropped approximately 20 % further than the already extremely steep (20 %) drop in the overall stock market over this period. This is consistent with the view expressed by some observers that, on average, global hospitality shares dropped approximately half of their market values as a result of the pandemic.

Among the more interesting findings of the study are that, financially, hotels performed better than restaurants, which themselves performed better than casinos. These findings are consistent with medical recommendations concerning the relative safety of various hospitality-related activities and, therefore, also with the tenets of financial market efficiency in the hospitality sector. Although only the US and Japan were represented by a sufficient number of companies to support a separate analysis, the fact that Japanese

24 We are grateful to an anonymous referee for bringing this work to our attention.
25 See footnote 5 above.
26 https://blog.ehl.edu/lausanne-report-shaping-the-future-of-hospitality-2
27 “Hospitality and COVID-19: How long until ‘no vacancy’ at US hotels?” https://www.mckinsey.com/industries/travel-logistics-and-transport-infrastructure/our-insights/hospitality-and-covid-19-how-long-until-no-vacancy-for-us-hotels#
28 https://www.rollcall.com/2020/07/17/mnuchin-gives-hints-of-ppp-changes-in-next-covid-19-relief-bill/
hospitality companies fared so much better than their US counterparts is consistent with the hypothesis that Japan’s less “individu-
alist” culture (as measured by Hofstede’s individualism versus collectivism index) largely spared it from the worst ravages of the pandemic.

The findings of the study should prove of significant interest to both equity investors and hospitality managers, and suggest that simple, traditional accounting and financial metrics were more highly-correlated with the market- and risk-adjusted cumulative abnormal return reductions registered by the studied hospitality firms than more esoteric variables such as environmental, social, and governance (ESG) ratings. In particular, hospitality firms with strong balance sheets and income statements characterized by relatively low leverage ratios, high market value (consistent with a “too big to fail” mentality), and higher price/earnings ratios (implying higher relative profitability) all fared better than smaller, weaker firms. In no case did the employed ESG variable possess any predictive power.

From the context of governmental authorities and their newly assumed roles as “lenders of last resort” during periods of significant economic crisis, the study may hold particular interest. Given that hospitality firms ranked highly among companies receiving emergency loans from the US government’s paycheck protection program (PPP), it is likely that the present results may help to guide lending authorities as they seek to “economically triage” struggling hospitality firms during serious emergencies yet to come.

Declaration of Competing Interest

The authors report no declarations of interest.

Appendix A

Description of the variables.

| Variable            | Description                                                                 | Source                              |
|---------------------|-----------------------------------------------------------------------------|-------------------------------------|
| CUMULATIVE AR       | The dependent variable. The sum of daily abnormal returns over the event window where daily abnormal returns = Actual Raw Returns - Predicted Returns and predicted returns are based on the market model. | Bloomberg                           |
| ESG                 | A proprietary score of a firm’s environmental, social and governance disclosure where higher scores are associated with higher levels of ESG. | Bloomberg                           |
| PE                  | The price-to-earnings level of the firm as of the end of December 2019.     | Bloomberg                           |
| MARKET CAP          | The market capitalization of the firm as of the end of December 2019. This value is reported in raw format in the summary statistics and the natural log of the variable is utilized in all regressions. | Bloomberg                           |
| DEBT-TO-EQUITY      | The debt-to-equity ratio of the firm as of the end of December 2019.         | Bloomberg                           |
| ROA                 | The return-on-equity of the firm as of the end of December 2019.             | Bloomberg                           |
| REV_GROWTH          | The year-over-year revenue growth from 2018 to 2019 for the firm.           | Bloomberg                           |
| RETURN              | The calendar year 2019 raw returns for the firm.                            | Bloomberg                           |
| VOLATILITY          | The annualized standard deviation of stock returns for calendar year 2019 for the firm. | Bloomberg                           |
| PDI                 | The power distance index for the nation of the firm as measured by Hofstede. | https://geerthofstede.com/research-and-vsm/dimension-data-matrix/ |
| IDV                 | Individualism versus collectivism for the nation of the firm as measured by Hofstede. | https://geerthofstede.com/research-and-vsm/dimension-data-matrix/ |
| UAI                 | The uncertainty avoidance index of the nation of the firm as measured by Hofstede. | https://geerthofstede.com/research-and-vsm/dimension-data-matrix/ |
| COVID CASES         | The number of cumulative COVID cases reported in a given country as of March 31, 2020 as | https://coronavirus.jhu.edu/ |

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