The impact of COVID-19 pandemic on hospitality stock returns in China

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Abstract

Coronavirus disease (COVID-19) has already devastated the world, and the economy becomes the most critical challenge for any country worldwide. The increasing uncertainty of the COVID-19 outbreak has made stock markets in China more turbulent and less predictable. Under the current exceptional circumstances, the hospitality industry suffered the most due to the travel restrictions. This research thus assesses the dynamic relationship among the COVID-19 outbreak, macroeconomic fluctuations and hospitality stock returns based on a structural VAR framework from 13 January to 11 May 2020, in China. Evidence reveals that macroeconomic fluctuations and hospitality stock returns are significantly affected by shocks from the COVID-19 outbreak. An unanticipated positive change of the COVID-19 explosion triggers an addition in exchange rates and causes a reduction in the stock market and hospitality industry returns. For the impacts of the exchange rate, findings reveal that a surprise increase in exchange rates (currency depreciation) exerts a significant negative influence on stock market returns. Additionally, a positive change of stock market returns is linked to a decline in exchange rates and a rise in hospitality industry returns. Therefore, knowledge of these relationships can enable policymakers to evaluate and implement effective policies to stabilize the stock markets and help investors to make appropriate investment strategies.

KEYWORDS
China, COVID-19, stock returns, structural VAR

JEL CLASSIFICATION
I10; G12; L83; C32

1 | INTRODUCTION

Coronavirus disease (COVID-19) is a contagious disease of respiratory illness caused by a newly discovered coronavirus. It was first discovered in Wuhan, China’s central province of Hubei, in December 2019, and then started to spread rapidly in other regions and provinces of China. Two months later, the total number of confirmed cases had reached 60,000, with over 1,500 deaths on February 14, 2020. In early March, the World Health Organization (WHO) issued an alert about the COVID-19 as a global pandemic. According to its statistics, the COVID-19 has infected more than 4.3 million people and led to almost 300,000 deaths by May 15, 2020. Figure 1 presents a direct visualization of the COVID-19 outbreak. Along with the tremendous suffering and enormous loss of...
human life, COVID-19 is affecting the whole world and causing incalculable economic losses. This pandemic is predicted to trigger the economic crash, unparalleled since the Great Depression of the 1930s. Therefore, an important and urgent question immediately arises as to how financial markets react to the sudden spread of the COVID-19.

China was the first economy to be hit by the epidemic. Its gross domestic product (GDP) experienced significantly negative growth of 6.8% in the first quarter of 2020, and the surveyed urban unemployment rate climbed to about 6.2% in February (National Bureau of Statistics of China, 2020). In addition, the drop in investment of fixed assets was more than twice the decline of GDP, and household consumption also fell sharply (Zhao, 2020). The COVID-19 outbreak caused great disruptions in industrial production activities. The first industry, secondary industry and tertiary industry saw negative growth of 3.2%, 9.6%, and 5.2% in the first quarter of 2020, respectively (Liu, Liu, & Yan, 2020). Increased uncertainty over the COVID-19 outbreak also resulted in the financial markets becoming more volatile and less predictable (Apergis & Apergis, 2020; Zhang, Hu, & Ji, 2020). For example, the Shanghai Stock Exchange Composite Index in China began to drop during late 2019 and early 2020, as presented in Figure 2, amid the sudden and dramatic volatility of the COVID-19 outbreak. Against this background, it is essential for researchers, practitioners and policymakers to assess the impact of the pandemic on economic activities and financial markets in China.

The negative impacts of national lockdowns and global mobility restrictions have propagated to many industries. Among them, the tourism-related industry, including hotels, restaurants, theme parks and airlines, suffered the most due to travel restrictions.
(Goodell, 2020; Nicola et al., 2020; Sobieralski, 2020). The capacity utilization of the aviation industry (for example, in major airlines) has dropped by about 60–80%. In addition, business shutdown orders and preventative practices have reduced the operating capacity of restaurants, causing vulnerability to this industry (Kim, Kim, & Wang, 2021). As the most important part of the tourism-related industry, the hospitality industry worldwide has faced dramatic reductions in its business activity (Ahmar & de Val, 2020; Baldwin & Weder di Mauro, 2020; Nicola et al., 2020). People are stressed and are afraid of venturing out in public areas, causing a significant drop in hospitality business. Given that the ensuing economic shock of this pandemic remains indefinite, there is an urgent need to investigate the influence of COVID-19 not only through its actual impact on macroeconomic conditions, but also on stock market reactions. How the COVID-19 crisis affects stock returns of the hospitality industry is an important issue worth a further in-depth investigation.

When identifying the determinants of stock price fluctuations, the financial pricing theory posits that asset prices are determined by investor’s expectations about the discounted values of future cash flows, which are commonly influenced by economic fluctuations (Chen, Chien, & Lee, 2011; Lee, Lee, & Lee, 2014; Lee, Lee, & Lien, 2019; Liu & Lee, 2018). Previous empirical works mostly pay attention to the influence of macroeconomic conditions on stock returns (e.g., Bulmash & Trivoli, 1991; Fama & French, 1988; Rapach, Wohar, & Rangvid, 2005). While the role of non-macroeconomic considerations is highlighted by recent experiences, such as natural disasters, epidemics, terrorism and financial crises, in affecting the performance and development of tourism-related industry (Barrows & Naka, 1994; Chen, 2007; Chen, Jang, & Kim, 2007; Chen, Kim, & Kim, 2005; Lee & Chen, 2020a; Lee, Olasehinde-Williams, & Akadiri, 2020; Tse, So, & Sin, 2006; Wang, 2009), empirical evidence on hospitality stock returns is scarce. Under the current exceptional circumstances, it remains unknown as to what extent the spread of the COVID-19 pandemic affects the stock returns of the hospitality industry. This research strives to assess the influence of COVID-19 shock on the hospitality industry returns to fill the void in the literature. Knowledge can not only help investors to formulate appropriate investment strategies but also assist policymakers in dealing with fluctuations in the stock market.

This research therefore evaluates the dynamic linkages among the COVID-19 outbreak, macroeconomic fluctuations and hospitality stock returns by employing the structural vector autoregression (SVAR, hereafter) approach from January 13 to May 11, 2020 in China. Compared with the conventional VAR specification that requires partial identification indicating causal ordering, the SVAR framework is considered superior, because it clearly offers an economic justification behind the restrictions on the identification of contemporaneous relationships among variables (Lee, Lee, & Ning, 2017; Loría, Sánchez, & Salgado, 2010). Thus, the SVAR model is capable of quantitatively assessing the dynamic interactions among the COVID-19 outbreak, macroeconomic fluctuations and hospitality stock returns. Two major contributions are provided in this research. First, the existing literature is extended to the behaviour of stock prices due to the impact of the pandemic, which is rarely targeted in prior literature. Our findings thus not only highlight how macroeconomic fluctuations affect hospitality stock returns, but also gain new insight into the extent to which COVID-19 interacts with stock returns. Second, applying the impulse response and variance decomposition within the SVAR framework allows us to deduce the interactions among variables of interest.

The remaining parts are arranged in the following sections. Section 2 presents a summary of prior related research to achieve the goals of the paper. Section 3 introduces the methodology used herein. Section 4 describes the data and the research variables, while Section 5 discusses the results. Section 6 derives policy implications and conclusions.

2 RELATED LITERATURE

Since the ground-breaking research of Chen, Roll, and Ross (1986), there is a conspicuous effort aimed at exploring how stock prices react to macroeconomic movements (e.g., Bulmash & Trivoli, 1991; Fama & French, 1988; Rapach et al., 2005). According to the theoretical consideration of the dividend discount model, Chen et al. (1986) postulate that the movements of macroeconomic conditions are regarded as systematic predictors of stock returns due to its profound influence on future earnings, stock dividends and discount rates. In the context of the hospitality research, Barrows and Naka (1994) were the first to empirically assess the influence of macroeconomic conditions on the U.S. hospitality stock returns. Evidence shows that the inflation rate, money supply and consumption have a significant explanatory content for forecasting stock returns. Following this vein, Chen et al. (2005) and Chen (2007) reach the same results and find such macroeconomic factors are important explanatory factors for returns of hospitality stock in Taiwan and China, respectively.

While the researches we refer to above are relevant for understanding the macroeconomic impact on stock
returns, there is an increasing perception highlighting the importance of non-macroeconomic forces, including disasters, epidemics, terrorism, political events and financial crises, in affecting stock market returns (Al-Awadhi, Alsaifi, Al-Awadhi, & Alhammadi, 2020; Ichev & Marinč, 2018). In hospitality literature, Chen et al. (2005), explore the effects of macroeconomic fluctuations and non-macroeconomic considerations on returns of Taiwan’s hospitality stock and reveal that the 921 earthquakes in 1999, the 9/11 terrorist attacks in 2001 and the spread of Severe Acute Respiratory Syndrome (SARS) in 2003, severely damaged returns. Focusing on China’s hospitality industry, Chen (2007) shows that the Asian financial crisis, the 9/11 terrorist attacks, and the SARS outbreak exert a negative influence on stock returns. Using the event-study approach, Chen et al. (2007) also reveal that the cumulative mean abnormal returns are negative after the spread of SARS.

The COVID-19 pandemic has attracted widespread global attention since late 2019, with many societies and economies under this crisis now suffering an unpredictable exogenous shock. Increasing interest has thus arose for assessing the influence of COVID-19 on economic activities and financial markets (Al-Awadhi et al., 2020; Al-Thaqeb, Algharabali, & Alabulghafoor, 2020; Baker et al., 2020; He, Sun, Zhang, & Li, 2020; Liu, Choo, & Lee, 2020; Liu, Wang, & Lee, 2020; Salisu, Raheem, & Eigbiremolen, 2020). Baker et al. (2020) use text-based methods to quantify the influence of COVID-19 on U.S. stock market volatility, finding that the COVID-19 pandemic has caused the greatest stock market volatility. Salisu et al. (2020) assess the hedging effectiveness of U.S. stocks against financial and health risks and conclude that defensive stocks are capable of hedging against pandemic-induced uncertainty. Al-Awadhi et al. (2020) argue the effect of the COVID-19 outbreak on stock market outcomes in China. Their evidence reveals that the China stock market experienced negative returns during the outbreak. Using the event study approach, He et al. (2020) also find that the pandemic has adversely affected Chinese transportation, mining, electricity, heating and environmental industries. All these studies have identified that the pandemic negatively is affecting nearly every industry worldwide.

Compared with the focus of the economic and social disruptions of COVID-19, the influence of the pandemic on tourism-related industries is significantly under-investigated. Lee and Chen (2020b) indicate that COVID-19 deaths exert a sharp negative influence on travel and leisure industry returns across 65 countries. Using restaurant firms’ sales data in China, Kim et al. (2021) explore the influence of COVID-19 on the restaurant industry, presenting that operational characteristics and brand effects mitigate the negative influence of various business shutdowns and restrictions. Based on a global sample of 185 countries, Škare, Soriano, and Porada-Rochaño (2020) also show that the pandemic exerts a much greater destructive impact on the travel and tourism industry. However, no sector has been as severely affected by it as the hospitality industry. In this research we extensively analyse the dynamic relationships among the COVID-19 outbreak, macroeconomic fluctuations and hospitality sector stock returns.

### 3 | METHODOLOGY

The SVAR analysis introduced by Sims (1980) is employed to identify the influence of COVID-19 and their correlation with macroeconomic fluctuations and hospitality stock returns. Therefore, a p-order SVAR model is then specified as:

$$A_0 y_t = C_0 + \sum_{i=1}^{p} A_i y_{t-i} + \epsilon_t,$$

where $y_t = \{\text{COV}_t, \text{EX}_t, \text{IR}_t, \text{MR}_t, \text{HIR}_t\}$ represents a 5 × 1 vector of endogenous variables, $A_0$ is a 5 × 5 matrix specifying the contemporary relations between variables, $C_0$ represents constant terms, $A_i$ are the 5 × 5 autoregressive matrices, $\epsilon_t$ refers to a 5 × 1 vector of mutually uncorrelated structural innovations.

To make the estimation practical and realistic, the reduced form of the model is obtained by multiplication of both sides of Equation (1) with an inverse matrix $A_0^{-1}$ as:

$$y_t = a_0 + \sum_{i=1}^{p} B_i y_{t-i} + \epsilon_t,$$

where $a_0 = A_0^{-1} C_0$, $B_i = A_0^{-1} A_i$, and $\epsilon_t = A_0^{-1} \epsilon_t$, $\epsilon_t$ are linear combinations of $\epsilon_t$, with a covariance matrix of $E[\epsilon_t \epsilon_t'] = A_0^{-1} D A_0^{-1}$.

The structural innovations can be identified by imposing certain appropriate restrictions on $A_0^{-1}$. We therefore enforce the short-run restrictions as:

$$
\begin{bmatrix}
\epsilon_{\text{COV}, t}^C \\
\epsilon_{\text{EX}, t}^C \\
\epsilon_{\text{IR}, t}^C \\
\epsilon_{\text{MR}, t}^C \\
\epsilon_{\text{HIR}, t}^C
\end{bmatrix}
= \begin{bmatrix}
\alpha_{11} & 0 & 0 & 0 & 0 \\
\alpha_{21} & \alpha_{22} & 0 & 0 & 0 \\
\alpha_{31} & \alpha_{32} & \alpha_{33} & 0 & 0 \\
\alpha_{41} & \alpha_{42} & \alpha_{43} & \alpha_{44} & 0 \\
\alpha_{51} & \alpha_{52} & \alpha_{53} & \alpha_{54} & \alpha_{55}
\end{bmatrix}
\begin{bmatrix}
\epsilon_{\text{COV}, t}^C \\
\epsilon_{\text{EX}, t}^C \\
\epsilon_{\text{IR}, t}^C \\
\epsilon_{\text{MR}, t}^C \\
\epsilon_{\text{HIR}, t}^C
\end{bmatrix}
$$

For the ordering in Equation (3), we postulate that the COVID-19 does not affect by contemporaneous

$$y_t = a_0 + \sum_{i=1}^{p} B_i y_{t-i} + \epsilon_t,$$
fluctuations in macroeconomic shocks. Macroeconomic shocks does not receive contemporaneous retroaction from switched hospitality stock returns. Hospitality stock returns are allowed to contemporaneously respond to all other changes in the system.

4 | DATA DESCRIPTION

This article utilizes daily data on the observations of COVID-19, macroeconomic fluctuations, and hospitality stock returns from 13 January to 11 May 2020, in China, subject to data availability. The spread of COVID-19 is measured by both daily new confirmed cases (DNC) and total confirmed cases (TCC), which is sourced from the website of the World Health Organization (WHO). We use exchange rates (EX), interest rates (IR) and stock market returns (MR) to assess the macroeconomic fluctuations to proxy for macroeconomic conditions. These variables are obtained from the China Foreign Exchange Trade System, the website of the Shanghai Interbank Offered Rate and the Shanghai Stock Exchange, respectively. Nominal prices are expressed in log-returns. Table 1 contains the relevant details about the variables used in our analysis. Figure 3 portrays the time series and box plots, which provides tentative findings throughout the sampling era.

There are five hotel companies publicly traded in China’s A-share stock market. Huatian Hotel and Hainan Dadonghai Tourism Centre are listed in Shenzhen Stock Exchange (SZSE), whereas BTG Hotel, Jinjiang Hotel and Jinling Hotel are listed in Shanghai Stock Exchange (SSE). We first compute the value-weighted hospitality price index (HPI) using the price and shares information of these hospitality stocks to calculate the hospitality industry returns (HIR), then calculate its returns as:

$$H_{IR} = (\ln HPI_t - \ln HPI_{t-1}) \times 100,$$

Table 2 provides the summary statistics associated with the testing results of the augmented Dickey and Fuller (1979, ADF hereafter), Kwiatkowski, Phillips, Schmidt, and Shin (1992; KPSS hereafter), Phillips and Perron (1988, PP hereafter) and Zivot and Andrews (1992; ZA) unit-root tests for these variables. The results reveal that the unit-root hypothesis is rejected for EX, MR and HIR at the 1% significance level, for IR at a 5% level, and DNC and TCC at a 10% level. We thus conclude that the non-stationarity of the variables is not a major concern for estimating impulse response functions.

5 | EMPIRICAL RESULTS

5.1 | Impulse response functions

In this section, we perform an impulse-response analysis to quantify the transmission of structural shocks among the spread of COVID-19, macroeconomic fluctuations and hospitality stock returns. Both DNC and TCC are used to track the impact of the COVID-19 outbreak. We establish an SVAR specification with optimal lag order one based on various information criteria, namely LR, AIC and SC, as shown in Table 3. Figure 4 presents the impulse response functions over 12 days of exchange and, interest rates, stock market, and hospitality industry return to one standard deviation structural shock when the spread of COVID-19 is proxied by daily new confirmed cases. The one standard error bands shown by dotted lines are generated by using 1,000 Monte Carlo simulations.

Column (1) illustrates the responses to unanticipated COVID-19 shocks. Evidence reveals that unexpected positive shocks of the COVID-19 pandemic have a slight and insignificant influence on exchange and interest rates, and hospitality industry returns in China. It triggers transitory increases in exchange rates (currency depreciation), persistent decreases in interest rates, and short-lived decreases in hospitality industry returns. Additionally, the graph of the third row indicates that a sudden increase in COVID-19 outbreak causes a significant drop in stock index returns, which is consistent with...
Ichev and Marinč (2018) for Ebola Virus Disease (EVD) outbreak, and Al-Awadhi et al. (2020) for COVID-19 outbreak. The economic rationale behind this result can be attributed to investor sentiment. Regarding behavioural finance, anxious investors are pessimistic about future returns and less likely to take risks, causing price changes (Baker & Wurgler, 2007; Cen & Liyan, 2013). In their pessimism about the investment prospects, investors sell off shares in the event of an outbreak of infectious diseases (Bai, 2014; Baker, Wurgler, & Yuan, 2012).

Column (2) reveals the responses to exchange rate shocks. The graphs of the second and third rows indicate that an unanticipated innovation to exchange rates has a slight and insignificant influence on interest rates and stock market returns. These results reveal that unexpected increases in exchange rates (currency

FIGURE 3  Plots of underlying series used in this study [Colour figure can be viewed at wileyonlinelibrary.com]
depreciation) cause a persistent decrease in interest rates and a transitory decrease in stock market returns. We also find the response of hospitality industry returns on fluctuations in exchange rates is statistically insignificant, which can be attributed to the interaction between price competitiveness and international capital flow. Price competitiveness is often considered as the most fundamental condition for tourism activities (Dwyer, Forsyth, & Rao, 2000; Lin, Chen, Lin, Tseng, & Su, 2020). An increase in exchange rates (currency depreciation) would lower the cost for international tourists and increase tourism activities, thereby increasing hospitality stock returns (Assaf & Josiassen, 2012; Gokmenoglu & Hadood, 2019). However, domestic currency depreciation reduces asset prices and thus decreases its returns. Therefore, our results suggest that the exchange rate plays an uncertain role in explaining the hospitality industry returns.

Column (3) reports the responses to interest rate changes. The graph of the third row suggests that an unanticipated positive interest rate shock causes persistent and partly statistically relevant increases in stock market returns, confirming the findings of Chen et al. (1986), Bulmash and Trivoli (1991). Chen et al. (2005) noted that an increase in interest rate would lower the present value of future cash flows, thus reducing the appeal of investment projects. Additionally, as shown in the graphs of first and fourth rows, although this shock has an insignificant influence on exchange rates and hospitality industry returns, their signs are economically meaningful, as reducing interest rates associate with rising exchange rates (currency depreciation) and stock returns.

Column (4) shows the responses to unanticipated innovations to stock market returns. The graph of the first row suggests that an unforeseen positive change in stock market returns has a significantly negative influence on exchange rates, which is consistent with our expectations. Also, the graph of the fourth row indicates that a sudden increase in stock market returns causes a sharp and significant rise in hospitality industry returns. The result confirms the prediction of conventional finance theory, that is, Capital Asset Pricing Model (Lintner, 1965; Sharpe, 1964) and Arbitrage Pricing Theory (Ross, 1976).

Figure 5 presents the impulse response functions when the COVID-19 outbreak is proxied by total confirmed cases. Compared with our earlier results, some clear patterns can be observed. First, the graph of Column (1) illustrates that unexpected spreads on the

| TABLE 2 | Data description and preliminary tests |
|---------|----------------------------------------|
|         | DNC  | TCC  | EX   | IR   | MR   | HIR  |
| Panel A: Summary statistics |
| Mean    | 731  | 66,250 | 7.012 | 1.411 | −0.001 | 0.000 |
| SD      | 1968 | 29,017 | 0.067 | 0.518 | 0.016  | 0.041 |
| Min.    | 0    | 41    | 6.861 | 0.661 | −0.080 | −0.105 |
| Max.    | 15,152 | 84,450 | 7.110 | 2.654 | 0.031  | 0.087 |
| Obs.    | 77   | 77    | 77   | 77   | 77    | 77   |
| Panel B: Unit root tests |
| ADF     | −3.242* | −8.424*** | −7.102*** | −3.641** | −8.838*** | −9.511*** |
| PP      | −3.227* | −3.263* | −7.165*** | −3.549** | −8.839*** | −9.547*** |
| KPSS    | 0.115  | 0.146* | 0.042 | 0.119 | 0.049  | 0.093 |
| ZA      | −5.556** | −6.285*** | −7.456*** | −5.008** | −9.247*** | −10.183*** |

Note: PP denotes unit root test proposed by Phillips and Perron (1988).
*Indicate significance at the 10% level, respectively.
**Indicate significance at the 5% level, respectively.
***Indicate significance at the 1% level, respectively.

| TABLE 3 | The appropriate lag order selection on the basis of information criteria |
|---------|-------------------------|
| Lag    | LR      | AIC   | SC   |
| 0      | NA      | −13.055 | −12.895 |
| 1      | 229.045** | −15.874** | −14.918** |
| 2      | 14.808  | −15.417 | −13.664 |
| 3      | 27.985  | −15.221 | −12.672 |
| 4      | 25.600  | −15.029 | −11.683 |
| 5      | 18.457  | −14.735 | −10.592 |
| 6      | 31.632  | −14.822 | −9.882 |

**Denotes the optimal lag length at the 5% significance level.
COVID-19 pandemic exert a significantly positive influence on exchange rates. It also has an adverse influence on the stock market and hospitality industry returns. These results conform to the findings of prior works, which indicates that non-macroeconomic factors are relevant in explaining stock returns (Barrows & Naka, 1994; Chen, 2007; Chen et al., 2005, 2007; Wang, 2009). The hospitality industry, like any other tourism-related industry, is influenced by disasters and terrorist attacks (Sonmez, Apostolopoulos, & Tarlow, 1999; Stafford, Yu, & Armoo, 2002). Chen et al. (2005) further indicate that the common feature of these non-macroeconomic factors is the safety of passengers. Particularly, safety is regarded as the most basic requirement for tourism activities. Our empirical results thus support this perspective and are consistent with Chen et al. (2005), Chen (2007), and Chen et al. (2007) that hotel stock returns react negatively to the SARS outbreak.

Second, the graphs of Column (2) reveal that an unanticipated innovation to exchange rates has significant influences on stock market returns. This result suggests that unexpected increases in exchange rates (currency depreciation) cause a transitory decrease in stock market returns. Third, the graphs of Column (4) suggests that an unforeseen positive change in stock market returns has a significantly negative influence on exchange rates. We also find that a sudden increase in stock market return causes a sharp and significant rise in hospitality industry returns.

We now focus on the influence of the COVID-19 outbreak on stock returns of each hospitality company. Figure 6 presents the impulse response functions for Huatian Hotel (HT), Hainan Dadonghai Tourism Centre (DH), BTG Hotel (BTG), Jinjiang Hotel (JJ) and Jinling Hotel (JL). The return responses of COVID-19 for these companies reveal similar patterns to those reported on the industry. Evidence shows that most hospitality companies significantly and negatively react to the COVID-19 outbreak, which supports the results of prior studies.

5.2 | Variance decomposition

We now investigate the forecast error variance decomposition to have more insights into the interdependence of
the spread of COVID-19, exchange rates, interest rates, stock market returns and hospitality industry returns. Tables 4 and 5 present the variance decomposition of the percentage contribution of the structural shocks to the variation of stock market returns and hospitality industry returns, respectively. The results of the 1, 2, 3, 6, 12, 18, 24, 30 and 36 days are reported to gauge the short- and long-term impacts of the factors on each other. Table 4 shows that changes in the COVID-19 outbreak are the primary origins causing stock market fluctuations. As reported in recent research, the COVID-19 pandemic has already devastated the world economy and causing incalculable economic losses (Al-Awadhi et al., 2020; Goodell, 2020; Sobieralski, 2020; Zhang et al., 2020). Table 5 displays that changes in market returns are the most important sources causing hospitality stock fluctuations. These results support the prediction of conventional finance theory, which highlights that systematic risks are the most important factors affecting stock returns (Chen, Zhao, Wang, & Lv, 2018). The percentage contribution of COVID-19 pandemic to the variation of hospitality industry returns is increasing since the COVID-19 pandemic is still spreading.

6 | CONCLUSIONS AND IMPLICATIONS

The dynamics of stock prices have been widely studied and examined in both theoretical and analytical literature. An immense volume of research has already researched the role of macroeconomic conditions in describing stock market returns. Although these studies are essential for us to deepen our knowledge of the spillover effects of macroeconomic conditions, how non-macroeconomic concerns, that is, natural disasters, epidemics, terrorism and financial crises, exert an influence on hospitality stock returns still lacks any proper investigation. COVID-19 has severely impacted the global economy and becomes the most critical challenge for any country worldwide. The increasing financial uncertainties during the period of infectious disease outbreaks

FIGURE 5 Structural impulse responses to one standard deviation structural shocks (COVID-19 total confirmed cases) [Colour figure can be viewed at wileyonlinelibrary.com]
have resulted in an urgent need to understand the response of the hospitality industry returns to the spread of COVID-19 pandemic. This article addresses the void in the literature by examining the interrelationship among the COVID-19 outbreak, macroeconomic fluctuations and hospitality stock return in China from 13 January to May 11, 2020, using an SVAR framework.

Our results overall first indicate that shocks from the COVID-19 pandemic play a pivotal role in explaining macroeconomic fluctuations and hospitality stock returns. The unforeseen spread of the COVID-19 pandemic has a significantly positive influence on exchange rates and a negative influence on stock market and hospitality industry returns. Given that the pandemic appears to exert a pronounced and substantial influence on macroeconomic fluctuations and stock price returns, policymakers should consider the responses of economic and financial activities to the pandemic so as to avoid

**FIGURE 6** Structural impulse responses to one standard deviation structural shocks for each hospitality stock returns (COVID-19 total confirmed cases) [Colour figure can be viewed at wileyonlinelibrary.com]
causing strong socioeconomic fluctuations. Governments should take appropriate restriction and containment measures to reduce the uncertainty and fear from the pandemic and thus stabilize the financial markets. In addition, investors and portfolio managers should be cautious about these forces when making investment strategies. Evidence also shows that a surprise increase in exchange rates (currency depreciation) exerts a significantly negative influence on stock market returns. Finally, a positive change in stock market returns is linked to a decline in exchange rates and a rise in hospitality industry returns. Policies that aim to stabilize stock markets should account for not only macroeconomic fluctuations, but also non-macroeconomic factors. Hospitality industry investors who want to allocate their assets more effectively should make predictions based on variations of the COVID-19 outbreak for enhanced accuracy.

Although this paper fills the gap in the extant research on the dynamic relationship among the COVID-19 outbreak, macroeconomic fluctuations and hospitality stock returns, some questions remain unanswered and should be specified, offering other directions for future research. First, in order to control for the complexity of the operations, this study solely focuses on hotel firms, which implies some missed opportunities for understanding COVID-19 impacts on other tourism-related industries. Such a consideration would further discover different impacts across various industrial characteristics. Second, until now, the spread of COVID-19 is still ongoing and thus a wider dataset with changes in epidemic and socioeconomic status would deepen the knowledge of it impacts. Finally, from the methodological perspective, recent advances in the connectedness method based on time-varying parameter vector autoregression have facilitated exploration into spillovers. It would also be interesting to investigate the dynamic features of the interaction between the pandemic and its economic and social disruptions by applying this method.

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### Table 4: FEVD for stock market returns

| Period | TCC | EX | IR | MR | HIR |
|--------|-----|----|----|----|-----|
|        |     |    |    |    |     |
| Panel A: Stock market returns |
| 1      | 22.773 | 0.803 | 1.820 | 74.604 | 0.000 |
| 2      | 21.051 | 3.369 | 1.698 | 69.089 | 4.794 |
| 3      | 21.096 | 3.358 | 1.708 | 68.789 | 5.049 |
| 6      | 21.277 | 3.350 | 1.709 | 68.626 | 5.038 |
| 12     | 21.485 | 3.340 | 1.727 | 68.423 | 5.025 |
| 18     | 21.547 | 3.337 | 1.736 | 68.359 | 5.020 |
| 24     | 21.565 | 3.336 | 1.740 | 68.340 | 5.019 |
| 30     | 21.570 | 3.336 | 1.740 | 68.335 | 5.019 |
| 36     | 21.571 | 3.336 | 1.741 | 68.333 | 5.019 |

### Table 5: FEVD for hospitality industry returns

| Period | TCC | EX | IR | MR | HIR |
|--------|-----|----|----|----|-----|
|        |     |    |    |    |     |
| 1      | 2.212 | 2.640 | 0.296 | 24.158 | 70.693 |
| 2      | 2.665 | 3.019 | 0.894 | 23.544 | 69.878 |
| 3      | 2.784 | 3.053 | 0.898 | 23.597 | 69.668 |
| 6      | 2.875 | 3.054 | 0.914 | 23.571 | 69.586 |
| 12     | 3.011 | 3.051 | 0.916 | 23.538 | 69.485 |
| 18     | 3.057 | 3.049 | 0.921 | 23.526 | 69.447 |
| 24     | 3.071 | 3.049 | 0.922 | 23.522 | 69.436 |
| 30     | 3.075 | 3.049 | 0.923 | 23.521 | 69.433 |
| 36     | 3.076 | 3.049 | 0.923 | 23.521 | 69.432 |
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CONFLICT OF INTEREST
The authors declare that they have no conflict of interest.

AUTHORS CONTRIBUTIONS
All authors provided critical feedback and helped shape the research, analysis and manuscript.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy restriction.

ETHICS STATEMENT
This is an original article that did not use other information, which requires ethical approval.

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