The impact of COVID-19 on business perspectives of sustainable development and corporate social responsibility in China

Dongyong Zhang¹ · Shuhui Lu¹ · Stephen Morse² · Lingyi Liu¹

Received: 8 December 2020 / Accepted: 26 August 2021 / Published online: 16 September 2021
© The Author(s), under exclusive licence to Springer Nature B.V. 2021

Abstract

The new coronavirus (COVID-19) has generated an unprecedented degree of social and economic impact on the planet, but few researchers have explored the repercussion of COVID-19 for sustainable development (SD) and corporate social responsibility (CSR), especially from the perspective of Chinese businesses. This paper is the first to outline the priority changes of both SD and CSR over the period of COVID-19 incidence in China. An online questionnaire survey of 1161 owners and managers of Chinese companies was conducted, and respondents were asked to score the priorities of their company over the pre, during and post COVID-19 periods. The research was carried out at the end of the first COVID-19 wave in China but during the period of lockdown in some parts of the country. It was found that there was a priority change regarding three dimensions of sustainable development and 13 aspects of CSR. While the social dimension of SD was prioritized during and post COVID-19, the environmental dimension was the only one deemed to be less important and less prioritized over the longer term after the pandemic. The top three short-term CSR priorities were having in place a workplace health and safety plan, engaging in philanthropic activities and protecting biodiversity, and the top three longer-term CSR priorities were job creation, protecting biodiversity and having in place a workplace health and safety plan. Environmental protection and using clean energy were not reported as a CSR priority. The paper concludes that China's recovery mode cannot be called 'green' and suggests ways this could be changed.

Keywords COVID-19 · Impact · Sustainable development · Corporate social responsibility (CSR) · Business perspective · China

✉ Dongyong Zhang
dongyongzhang.cn@gmail.com
Stephen Morse
s.morse@surrey.ac.uk

¹ College of Information and Management Science, Henan Agricultural University, 15 Longzi Lake Campus, Zhengzhou East New District, Zhengzhou 450046, China

² Centre for Environment and Sustainability, University of Surrey, Guildford GU2 7XH, Surrey, UK

1 Introduction

The new coronavirus (COVID-19) was first identified in Wuhan, China, December 2019, and since then has generated an unprecedented social and economic impact on the planet. At the time of writing, more than 170 million people worldwide have been infected and more than three million have died from it (WHO, 2020). The world has almost been brought to a standstill, and a positive side effect has been an improved air quality as road traffic and flights have been significantly reduced (Mandal & Pal, 2020; Quere et al., 2020; Zambrano-Monserrate et al., 2020). However, the improvement in environmental quality during the pandemic may not have a lasting effect and could even generate an environmental rebound effect after the pandemic as consumers look to make up for lost ground and businesses and governments scale-back their investments into sustainable development (Freire-Gonzalez & Vivanco, 2020; McCloskey & Heyman, 2020). Nonetheless, the aspects related to how businesses operate, how people live their lives, and how society is organized, etc., might be changed for good (Honey-Roses et al., 2020; Nicola et al., 2020).

The COVID-19 pandemic has resulted in much epidemiological and medical research devote to addressing the spread and impacts of the virus and seen the development of COVID-19 treatments and vaccine development (Sun et al., 2020; Wiersinga et al., 2020; Zhai et al., 2020). This was quickly followed by a surge of research on the environmental impacts of the pandemic especially as the virus containment measures have made COVID-19 a global experiment for the environment (Quere et al., 2020; Zambrano-Monserrate et al., 2020). Few researchers have looked specifically at the repercussions of COVID-19 for sustainable development (SD) and corporate social responsibility (CSR). Barbier and Burgess (2020) explored the impact of COVID-19 on CSR from a theoretical perspective, while Barreiro-Gen et al. (2020) undertook empirical research on sustainability priority changes due to COVID-19. From an Asian perspective, Liu et al. (2020) and Hassk-Saheem (2020) investigated the various business implications of COVID-19. However, research on the impacts of COVID-19 on both SD and CSR, especially from the perspective of Chinese businesses, is lacking. Given China's increasing influence on the global economy, the perspectives of Chinese businesses' on CSR and sustainability during and after the pandemic could influence not only China but also the global sustainability agenda. Although CSR in China has improved significantly in the years prior to COVID-19 (Li et al., 2019), it has to face the challenge posed by the COVID-19 pandemic since late 2019. This raises a number of important questions. For example, has CSR taken a backseat during the pandemic in China? Will China face an environmental rebound effect after the pandemic? Will the shocks provided by COVID-19 result in a change toward more genuine and authentic CSR as well as contribute to addressing global social and environmental challenges or will the emphasis be placed strongly on economic growth? The answers to these questions will be addressed in this paper with findings based on a survey of 1161 owners and managers of companies headquartered in mainland China, Hong Kong, Taiwan and Macao. The research reported here is the first of its type and explores the general impact of COVID-19 on Chinese businesses and their coping strategy, as well as changes in their SD priorities due to COVID-19 and the long-term implications. The research also analyzes changes in the CSR priorities of the companies and implications which arise from that. As the first economy that has successfully (so far) recovered from COVID-19, it is assumed that China's experience handling the impact of COVID-19 in the area of SD and CSR would make it a useful case study to explore the post-pandemic situation.

The following section of the paper will review the existing literature on SD and CSR in China along with the impacts observed to date of COVID-19 on SD and CSR. Section three of the paper presents the materials and methods employed in this research, including the design of the questionnaire-based survey, sampling characteristics and measurement of variables. It is followed by the results section which sets out the nature of the impact that COVID-19 has had on the companies, their coping strategies, the current business recovery situation, the changing priorities for SD and the changing CSR priorities. Discussion of the results will also be provided in this section. Section five presents the policy and managerial implications of the research. Finally, the paper sets out some conclusions and suggestions for future research.

2 Literature review

China had made great progress in sustainable development and CSR before the outbreak of COVID-19, but as an increasingly significant player in the global economy, China's SD and CSR have been affected by COVID-19 like the rest of the world does.

2.1 Sustainable development and corporate social responsibility in China

Sustainable development and CSR have often been seen as synonymous (Zhang et al., 2018). Both terms are concerned with progress along the triple bottom-line spanning economic, social and environmental concerns. In the context of SD, this triple bottom-line refers to the performance of the entire economy, whereas in the context of CSR, it relates to business performance. Hence, CSR can be thought of as a corporate concept of SD, and by integrating the spirit of SD into the business strategy, CSR creates a balance between economic interests, social expectations and environmental demands (Behringer & Szegedi, 2016; Zhang et al., 2018). The principle of SD has deep roots in China. The traditional Chinese philosophies such as Confucianism and Taoism contain elements that are fundamental to sustainable development. Confucianism believes that harmony between humans and nature is more important than good relations between people, while Taoism recognizes that the Universe works harmoniously in its own way and emphasizes that people should do what is natural and go with the flow (Li et al., 2016).

The modern concept of CSR was introduced into China after the country opened up its economy. As part of the global supply chains, some Chinese companies were required to accept modern Western CSR norms and standards brought about by multi-national companies (MNCs), particularly about working conditions (Hofman et al., 2017). CSR has gained in popularity since 2006 when the concept was legally recognized by China's new Corporate Law, and the number of Chinese companies that produce sustainability reports on a regular basis has increased from 19 in 2006 to 3040 in 2016 (WBCSD, 2017). However, CSR reporting in China is considered to be at a very preliminary stage, mainly because there is no legally enforceable CSR reporting guideline nor an external assurance of CSR disclosure (Noronha et al., 2012). Indeed, Chinese companies have been criticized for lacking a proactive attitude toward CSR disclosure, and even for those published reports, most of which were published by state-owned companies, the quality and reliability of the disclosed information were questionable (Biswas & Tortajada, 2020; Noronha et al., 2012). In addition, local governments in China still remain focused on economic indicators such as GDP, and many provincial governments have openly protected their largest corporate

polluters (Zhang et al., 2018). But the prospect is not all gloomy for China's CSR. The 14th Five-Year Plan (FYP, 2021–2025) adopted by China's National People's Congress (NPC) in March 2021 has drawn up a blueprint for good business, which is to promote high-quality development in all aspects, including the economy, environment, people's livelihood and well-being and realizing the rise of importance of China in the global economy (Xinhua 2021). The plan also acknowledges the negative impact of COVID-19 on the CSR progress made by many companies and emphasized the importance of adjusting CSR strategies, especially in the areas of good health and well-being, sanitation, sustainable cities and communities, responsible supply chain management, etc. (ibid).

2.2 Impact of COVID-19 on sustainability and CSR

The impact of COVID-19 on sustainability and CSR has been explored by scholars in Asia. Zhang et al. (2020) undertook an empirical study and found that sustainability priorities of Chinese companies have shifted toward the social dimension both during COVID-19 and into the post-pandemic period regardless of the ownership, size and market focus of the companies. However, all types of company prioritize the need for economic sustainability in the post-pandemic period and in relative terms environmental sustainability has declined in importance. Liu et al. (2020) focused on China, South Korea and Singapore and examined the business and economic implications of COVID-19 from the theoretical underpinnings of entrepreneurship, agility and resilience. They concluded that COVID-19 has resulted in a decoupling from China's supply chains and the relocation of strategic manufacturing operations out of China and suggested greater collaboration between governments and industries to ensure minimum disruption in global supply chains in the post-pandemic period. Haak-Saheem (2020) looked at businesses in Dubai and discussed the impact of COVID-19 on talent management. He concluded that the post COVID Dubai employment market will see stronger competition for jobs and talent, increased flexibility of work, space and time, have active support to assist individuals to find jobs and increased investment in talent retention. Yoshikawa and Chua (2020) investigated the relationship between shareholder activism in Japan and COVID-19 and explored the directions shareholder activism could take post the pandemic. Gao and Ren (2020) discussed the challenges and opportunities that the global value chains were facing as a result of COVID-19 and how the current dependency on Asian countries might be reshaped by the pandemic.

Scholars in other part of the world have also tried to explore the impact of COVID on businesses and CSR, with some of the studies being based on theoretical analysis, while others are based on empirical evidence. Barbier and Burgess (2020), taking a more theoretical approach, identified three affordable and innovative policy mechanisms for developing countries to achieve sustainability and development objectives after COVID-19. He and Harris (2020) also employed a theoretical approach to examine how COVID-19 could influence the development of CSR and marketing and noted how the COVID-19 pandemic has offered an opportunity for businesses to shift toward more genuine and authentic CSR, instead of 'greenwash' and lip service, as well as contribute to addressing global social and environmental challenges. He and Harris's (2020) view has been supported by Palma-Ruiz et al. (2020) who adopted an empirical approach by investigating Spanish trading companies' investment strategies during COVID-19, and they found socially responsible investing could serve as a competitive strategy for Spanish companies in times of upheaval such as the COVID-19 pandemic. Barreiro-Gen et al. (2020), on the other hand, explored corporate sustainability priority changes as a result of COVID-19 by surveying 653 organizations

around the world. They found that the priority shifted toward the social dimension for most organizations and the environmental dimension had witnessed a diminution in importance. Indeed, COVID-19's impacts on most types of business operation may have already led to some CSR initiatives being modified or canceled (Barreiro-Gen et al., 2020). This result is confirmed by Garcia-Sanchez & Garcia-Sanchez (2020) who employed content analysis to empirically investigate large Spanish companies' CSR during COVID-19 and found that economic interests were more important for most of them.

However, few researchers have looked at the impact of COVID-19 on both SD and CSR, especially from the perspective of Chinese businesses, and changes to longer-term post-pandemic CSR priorities have rarely been mentioned. The research set out in this paper aimed to address these gaps by exploring not only SD but also the CSR priority changes of Chinese businesses during and post the COVID-19 pandemic.

3 Materials and methods

The research framework adopted for this research is summarized as Fig. 1.

Data collection for the research was primarily based on a questionnaire survey implemented in July 2020; the month when China had passed the peak of its first wave of COVID-19 although most of the country was still in lockdown. Because of the travel restrictions and the fact that some companies had not resumed their business, it was decided to implement the survey online using a convenience-based sampling. A Chinese online survey platform (Wenjuanxing) was used to generate the questionnaire and the link to and/or the QR code of the questionnaire was sent to potential respondents that the team had professional or personal connections with via WeChat (a Chinese multi-purpose messaging, social media and mobile payment app). The targeted respondents were owners and other management team members of companies headquartered across China. A total of 1178 questionnaires were returned, of which 1161 (99%) were considered valid in the sense that they came from different IP addresses and the time used to answer the questionnaire

Fig. 1 Research framework

was no less than 207 s; the latter being the shortest time tested by the authors to finish the questionnaire, whether using a mobile phone or a computer. Following the survey, a series of telephone and/or WeChat messaging interviews were conducted with key informants (seven company owners who the authors had close personal and/or professional connections with) to address any information gaps identified in the survey, which also allowed for triangulation.

3.1 Questionnaire design

Questionnaire design method adopted in the survey was based on Bryman et al. (2012). After a pilot study in June 2020, a questionnaire was finalized in Chinese. It comprised three parts with themes outlined in Fig. 2:

1. The demographic characterization of the surveyed companies, the general impact that COVID-19 had on them, how they coped with it and the current business recovery situation. Fourteen single and multiple-choice questions were asked in this part, and some of the questions were open-ended.
2. The changing priorities of the companies following the outbreak of COVID-19 regarding the three dimensions of sustainable development—social, economic and environmental. The respondents were asked to rate the importance of each dimension in a general sense based on the reality of their own company (before and during COVID-19) and their

Fig. 2 Outline of questionnaire survey

prediction (post COVID-19). A total of nine questions (each dimension was assessed three times) are included in this part of the questionnaire. Each question was answered using a 5-point Likert scale, with 1 being the least important, 5 being the most important and the others in the middle.

3. If and how COVID-19 had changed the CSR priorities of the respondent's company and whether the changes will remain in place once the pandemic has ended. Respondents were asked to rate the importance of 13 CSR indicators drawn from Carroll's (1991) pyramid of CSR which includes four components, i.e., economic responsibility, legal responsibility, ethical responsibility and philanthropic responsibility. Based on this definition, the 13 indicators were: profit-making and wealth creation, creating jobs, paying taxes, complying with the law, respecting ethical norms, ensuring corporate integrity, being against corruption, having in place a workplace health and safety plan, opposing employment discrimination, ensuring equal pay for equal work, protecting the environment and using clean energy, protecting biodiversity, engaging in philanthropic activities and community service. Each of these 13 indicators was rated three times (pre, during and post COVID-19) which means that this section had a total of 39 questions, and a 5-point Likert scale, with 1 being the least important and 5 being the most important, was employed for each question.

3.2 Sample characteristics

Table 1 shows the profiles of the surveyed companies. Out of 1161 companies, almost half of them (554) had existed for between 4 and 10 years, 263 (22.7%) had been around for between 11 and 20 years, 225 (19.4%) for more than 20 years, and 119 (10.2%) were established within the past 4 years. In terms of the ownership, 70.5% of them (818) were private-owned companies, 195 (16.8%) were state-owned enterprises (SOE), 76 (6.5%) were international joint ventures, and 71 (6.1%) were individual-owned. Half of the companies (589) had between 20 and 299 employees, a quarter (292) had between 300 and 999 employees, 157 (13.5%) had 1000 employees and more while only 123 (10.6%) had less than 20 employees. Based on where the customers were located, 65 (5.6%) of the companies were entirely export-oriented, 201 (17.3%) were entirely domestic-oriented, one-third of them (381) had both domestic and overseas markets although domestic was the main market, and 514 (44.3%) also enjoyed both markets but were more export-oriented.

The surveyed companies covered 30 industries, including IT/e-commerce/Internet service (22.0%), manufacturing (13.7%), wholesale/retail (7.7%), fast moving consumer goods, i.e., snacks, drinks, cosmetics (6.9%), education/research/training (6.8%), clothing/textile/leather (4.9%), catering/entertainment/tourism (4.6%), real estate/construction (4.5%), communication/network equipment/value-added service (2.8%), finance (2.5%) and 23.7% other industries including furniture/crafts/toys, trade/import and export, automobile, etc.

These companies were headquartered in 32 regions in China. In total, 242 (20.8%) were in Beijing, 155 (13.4%) in Shanghai, 84 (7.2%) in Zhejiang, 79 (6.8%) in Jiangsu, 76 (6.5%) in Hebei, 70 (6.0%) in Guangdong, 68 (5.9%) in Henan, 55 (4.7%) in Sichuan, 53 (4.6%) in Hubei, 37 (3.2%) in Fujian, 33 (2.8%) in Shan'xi, 32 (2.8%) in Tianjin, 31 (2.7%) in Chongqing, 30 (2.6%) in Hunan, 15 (1.3%) in Anhui, another 15 (1.3%) in

Shandong, 11 (0.9%) in Liaoning, and the remaining 73 (6.3%) were in other parts of China.

3.3 Data analysis

SPSS 24 was employed to store and analyze the data. Welch's analysis of variance (ANOVA) was used to test the mean difference of indicators among the periods pre, during and post COVID-19. Welch's ANOVA was selected as the groups being compared did not have the same variance of Likert scale scores, and under such circumstances, it does have advantages when compared to nonparametric methods such as Kruskal–Wallis (Celik, 2020). Unlike nonparametric methods, Welch's ANOVA does require a normal distribution of data but is deemed to be robust with relatively large sample sizes as is the case in this study (Delacre et al., 2019).

3.4 Measurement of variables

The scores of each SD dimension and CSR indicator (based on 5-point Likert scale) for each COVID-19 stage were averaged, and the larger the mean score then the greater the importance of the dimension/indicator. The mean scores of each SD dimension and CSR indicator at later stages of COVID-19 were compared with those at previous stages, and the result was a mean change of the specific dimension/indicator (Barreiro-Gen et al., 2020). For example, the mean change of social dimension of SD for the period between mid-COVID-19 and pre-COVID-19 was the mean score of the social dimension during COVID-19 minus the mean score of the social dimension before COVID-19:

$$\text{Mean change}_{(\text{social dimension, mid vs. pre})} = \text{mean score}_{(\text{social dimension, mid})} - \text{mean score}_{(\text{social dimension, pre})}$$

Similarly:

$$\text{Mean change}_{(\text{social dimension, post vs. mid})} = \text{mean score}_{(\text{social dimension, post})} - \text{mean score}_{(\text{social dimension, mid})}$$

$$\text{Mean change}_{(\text{social dimension, post vs. pre})} = \text{mean score}_{(\text{social dimension, post})} - \text{mean score}_{(\text{social dimension, pre})}$$

If the mean change_(social dimension, mid vs. pre) was greater than zero, then social dimension of SD was assumed to have been prioritized during COVID-19 (Barreiro-Gen et al., 2020). If the mean change_(social dimension, post vs. mid) was greater than zero, then social dimension of SD was assumed to have been prioritized immediately after COVID-19. If the mean change_(social dimension, post vs. pre) was greater than zero, then social dimension of SD was assumed to have been prioritized in the longer term after the pandemic. The larger the mean change then the greater the level of prioritization.

4 Results and Discussion

The results confirm that Chinese companies in general have been impacted by COVID-19. However, the impact of COVID-19 on SD and CSR in China might be far-reaching over the longer term.

Table 2 The reported impact that COVID-19 had on the companies

The impact	Frequency	Percentage (%)
General business disruption	834	74.2
Profit falling	821	73.0
Consumer demand falling	778	69.2
Capital shortage	452	40.2
Cut-off of supply chain	412	36.7
Staff shortage	331	29.5
Interruption of distribution channels	320	28.5
Others	4	0.1

N = 1123; respondents can provide multiple answers

Table 3 Coping strategies that reported to have positive effect

Coping measures	Frequency	Percentage (%)
Resuming business swiftly but with great caution	911	81
Online remote working	712	63.4
Expanding supply chain	708	63
Switching to net direct sale	667	59.4
Switching to online marketplace	638	56.8
Online recruitment	607	54
Others	283	25.2

N = 1123; respondents can provide multiple answers

4.1 General impact of COVID-19 on Chinese companies, their coping strategies and current recovery situation

Out of 1161 respondents, only 38 (3%) reported that their company had not been affected at all by COVID-19, while more than half (648) reported having minor impact and 475 (41%) had been impacted significantly. Table 2 indicates that within the 1123 companies impacted by COVID-19, 74.2% suffered from general business disruption, 73% from profit falling, 69.2% from consumer demand falling, 40.2% from capital shortage, 36.7% from cuts in the supply chain, 29.5% from staff shortage and 28.5% from the interruption of distribution channels. Four respondents reported other problems caused by COVID-19 such as staff having to work longer hours.

Table 3 presents the different strategies that the companies adopted to cope with COVID-19, such as switching to remote working, online recruitment, expanding supply chains, switching to online distribution channels (net direct sale or online marketplace) and resuming business but with great caution.

The business recovery situation at the time of the survey (July 2020) is presented in Table 4. Out of the 1161 respondents, 111 (9.6%) reported that they resumed their business in February 2020 and as the Chinese New Year holiday ended the last day of January 2020, these companies were hardly interrupted by COVID-19. A total of 431 (37.1%) reported that they re-started working in March, and another 448 (38.6%) re-started their business in April. Only 171 (14.7%) resumed their business in May or later. As of July 2020 when the survey was conducted, almost half of the companies (542) had recovered from half to three

Table 4 The current recovery situation

	Frequency	Percentage (%)
<i>When did you company started to resume business?</i>		
February 2020	111	9.6
March 2020	431	37.1
April 2020	448	38.6
May 2020 or later	171	14.7
<i>How much of your production capacity is recovered now?</i>		
Lower than 25%	45	3.9
25–50%	190	16.4
51–75%	542	46.7
Above 75%	384	33.1

N = 1161

quarters of their production capacity, one third of them (384) had recovered more than 75% of their production capacity, while around one fifth (45 + 190) were at less than half of their production capacity.

4.2 Changes of sustainable development priorities in Chinese companies

Welch's ANOVA was carried out to test the mean difference among stages of COVID-19 (pre, mid and post) for each SD dimension (social, economic and environmental). Table 5 indicates that the perceived importance of each SD dimension pre, mid and post COVID-19 is significantly different, implying that there has been a change of SD priorities over the COVID-19 period. Table 5 shows an increasing trend of the mean scores of each SD dimension with the progression of the COVID-19 pandemic (column 3 of Table 5), and it would seem that the pandemic may have resulted in respondents valuing SD more and this appears to last into the post-pandemic period.

The mean change in each SD dimension between the three stages of COVID-19 is shown in Fig. 3. The 1st cluster of Fig. 3 compares mean changes of the three SD dimensions for the period between mid- and pre-COVID-19. The perceived importance of the social dimension of SD increased (0.774) more than that of the environmental dimension (0.626), while the economic dimension increased the lowest in importance (0.569) during

Table 5 Welch's ANOVA test for mean difference among three stages of COVID-19 for each dimension of SD

SD dimension	Stages of COVID-19	Mean score	Statistic ^a	df1	df2	Sig.
Social dimension	Pre	3.32	343.630	2	2305.312	***
	Mid	4.09				
	Post	4.35				
Economic dimension	Pre	3.65	214.548	2	2281.549	***
	Mid	4.22				
	Post	4.47				
Environmental dimension	Pre	3.38	231.080	2	2309.403	***
	Mid	4.01				
	Post	4.29				

this period. This increasing trend in importance of all three dimensions of SD continues into the post-pandemic period, though with lower momentum (2nd cluster of Fig. 3).

For the period between post- and pre-pandemic (3rd cluster of Fig. 3), respondents' perceived importance of the social dimension of SD (1.03) grows the most, followed by an increase in the environmental dimension (0.906) with the lowest change being for the economic dimension (0.823). This perhaps indicates a shifting prioritization toward social issues over the longer term after the pandemic although it should be noted that the importance of the economic dimension of SD was still perceived to be the highest in the post-pandemic period (4.47; 3rd column of Table 5). The relatively slow growth of the economic dimension might be partly due to its higher starting point (3.65).

However, considering the small differences among mean scores of SD dimensions for three stages of COVID-19, another Welch's ANOVA was carried out to test whether there was a statistically significant difference among mean scores of the three SD dimensions for each stage of COVID-19 (Table 6). Results in Table 6 indicate that there is a statistically significant difference ($p < 0.01$) between mean scores of the social, economic and environmental dimensions for each stage of COVID-19.

With the social dimension of SD catching up in terms of importance, and the economic dimension being a central concern, the environmental dimension of SD appears to be the one dimension that is in danger of being left behind for Chinese companies once the pandemic ends. This result is different from that of Barreiro-Gen et al. (2020) study which found that corporations focused more on economic and less on the social aspect of sustainability during the pandemic compared to the time prior to the pandemic. However, Barreiro-Gen et al. (2020) also noted that the environmental dimension of SD has been the least important one for companies during COVID-19.

Fig. 3 Mean increase of each dimension of SD amid and post COVID-19 compared to previous stages

Table 6 Welch's ANOVA test for mean differences among three SD dimensions for each COVID-19 stage

Stages of COVID-19	SD dimensions	Mean score	Statistic ^a	df1	df2	Sig
Pre	Social	3.32	30.119	2	2318.826	***
	Economic	3.65				
	Environmental	3.38				
Mid	Social	4.09	14.806	2	2317.373	***
	Economic	4.22				
	Environmental	4.01				
Post	Social	4.35	14.271	2	2309.155	***
	Economic	4.47				
	Environmental	4.29				

$N = 1161$; Mean score: 1 is least important, 5 is most important; a: Asymptotically F distributed

***: significant at $p < 0.01$

4.3 Changes of CSR priorities in Chinese companies

Respondents were asked to rate the importance of 13 CSR indicators based on Carroll's (1991) CSR pyramid for the three stages of COVID-19 (pre, mid and post the pandemic) and Welch's ANOVA was employed to test for differences (Table 7).

The results suggest that the perceived importance of all 13 CSR indicators was significantly different over the three stages of COVID-19 ($p < 0.01$), with an increasing trend of mean scores from the time prior to COVID-19 to the time the pandemic had ended in China (Column 3 of Table 7). It would appear that COVID-19 has raised awareness across all these areas of CSR, and this awareness extends into the post-pandemic era. The shaded cells in Table 7 are the largest three mean scores for the pre-, mid- and post-pandemic periods, indicating that complying with the law and the regulations, ensuring corporate integrity, having in place a workplace health and safety plan and respecting ethical norms are essential for Chinese business. It has to be noted that the mean scores of complying with the law and regulations and ensuring corporate integrity are some of the highest for all the COVID-19 periods, perhaps implying that they may well be the ingrained beliefs of Chinese businesses. However, COVID-19 seems to have changed the belief of respecting ethical norms (pre, 3.98) to having in place a workplace health and safety plan (mid, 4.37; post, 4.47).

Table 8 presents the results of a comparison between the indicators within each of the three periods, while the mean change of 13 CSR indicators at later stages of COVID-19 compared to previous stages of the pandemic is presented in Fig. 4. Based upon Table 8 and Fig. 4, Table 9 provides a summary of the CSR priorities and business essentials at different stages of COVID-19 for the Chinese companies included in the survey.

For the period between mid-COVID-19 and pre-COVID-19 (black bars in Fig. 4), the largest increase in scores is found for having a workplace health and safety plan (0.707), followed by engaging in philanthropic activities and community service (0.549) and protecting biodiversity (0.532). The need for a workplace health and safety plan, especially during the pandemic, is self-explanatory, but the other two indicators are perhaps less so. The private sector and China's entrepreneur philanthropists responded quickly when COVID-19 broke out in Hubei with donations of cash, goods and medical expertise (Shen,

2020). According to Yishan, the China Philanthropy Data Centre, from late January to 22 April 2020 COVID-19-related donations in China reached over 5 billion USD, and 72% of these donations were provided by companies (CSIS, 2020). Tens of millions of dollars have been channeled by the tech industry to scientific research groups around China for the development of COVID-19 testing, drugs and vaccines (Shen, 2020). Nearly 40% (463) of the respondents reported that their companies had donated medical supplies, 525 (45.2%) donated money and 682 (58.8%) had volunteered to help. In terms of protecting biodiversity, the COVID-19 coronavirus is closely related to viruses found naturally in wildlife (Adhikari et al., 2020) and animals such as bats are very likely to be the natural reservoir host of the virus (Zhou et al., 2020). The virus is thought to have first spread to humans in the wildlife market of Wuhan, and China announced (January 2020) a suspension of wildlife trade across the country and followed this with policy changes in February that completely banned the trade of wildlife for the purposes of consumption of food. These policy changes, along with the news that China's new Wildlife Protection Law will soon take effect, have been well-covered in news and social media platforms, thereby raising awareness of the urgency of protecting biodiversity in order to prevent future virus outbreaks. Overall, it would seem that the top three areas of CSR in terms of the mean change during

Table 7 Welch's ANOVA test on mean difference of each CSR indicator before, during and post COVID-19

	Stages of COVID-19	Mean score	Statistic ^a	df1	df2	Sig.
1. Profit-making and wealth creation	Pre	3.71	107.128	2	2304.772	***
	Mid	4.03				
	Post	4.28				
2. Job-creation	Pre	3.24	225.747	2	2316.984	***
	Mid	3.75				
	Post	4.12				
3. Paying taxes	Pre	3.37	113.426	2	2318.279	***
	Mid	3.62				
	Post	3.99				
4. Complying with the law and regulations	Pre	4.29	44.543	2	2288.051	***
	Mid	4.50				
	Post	4.62				
5. Respecting ethical norms	Pre	3.98	77.925	2	2288.675	***
	Mid	4.27				
	Post	4.44				
6. Ensuring corporate integrity	Pre	4.26	59.547	2	2287.364	***
	Mid	4.48				
	Post	4.63				
7. Anti-corruption	Pre	3.87	68.971	2	2309.227	***
	Mid	4.14				
	Post	4.35				
8. Having in place a workplace health and safety plan	Pre	3.66	221.194	2	2275.124	***
	Mid	4.37				
	Post	4.47				
9. Opposing employment discrimination	Pre	3.32	104.480	2	2316.575	***
	Mid	3.75				
	Post	3.97				
10. Ensuring equal pay for equal work	Pre	3.61	100.227	2	2305.543	***
	Mid	3.98				
	Post	4.19				
11. Protecting the environment and using clean resources	Pre	3.64	136.360	2	2300.804	***
	Mid	4.08				
	Post	4.31				
12. Protecting biodiversity	Pre	3.29	159.602	2	2312.854	***
	Mid	3.83				
	Post	4.11				
13. Engaging in philanthropic activities and community service	Pre	3.21	180.432	2	2314.780	***
	Mid	3.76				
	Post	4.01				

the pandemic are related to handling the impact of COVID-19 or eliminating the cause of it. Again, the smallest increases are for those areas where the pre-pandemic score was already relatively high (e.g., paying taxes and complying with the law and regulations), indicating a switch of priorities as an immediate response to COVID-19.

Not only is the mean change of having a workplace health and safety plan the highest priority during COVID-19, it ranks third based on mean score amid the pandemic (4.37, Table 8), following the need to comply with the law and regulations (4.50) and ensuring corporate integrity (4.48). This indicates that even though respondents prioritize the virus-related CSR initiatives during the pandemic, complying with the law and regulations and ensuring corporate integrity are still business essentials for Chinese companies.

The mean change of all the CSR indicators shows an increase in the post-pandemic phase compared with the period when COVID-19 was prevalent, although the level of change declined (grey bars in Fig. 4). Job creation (0.368), paying taxes (0.363) and protecting biodiversity (0.283) are the top three in terms of mean change of perceived importance. Creating more jobs would seem to be the immediate focus after the pandemic, and paying (postponed) tax would be a legal requirement. Monthly urban unemployment in China spiked at a record high in February 2020 at 6.2%, from 5.3% in January 2020 (NBSC 2020). In July 2020 when the survey was conducted, urban unemployment was 5.7%, unemployment for people between 25 and 59 years old was 5.0%, and unemployment for younger people was even higher (presumably because 8.7 million new college graduates entered the job market the same month; *ibid*). 'Employment' was the most frequently mentioned word in the Chinese Premier Li Keqiang's report at the National Congress in May 2020, and the report dropped China's GDP growth target and instead prioritized an employment target of creating 9 million jobs. High unemployment indicates that the economy is operating below full capacity and this would be expected to lead to lower GDP and personal income (Fraser & Sinfield, 1985). High unemployment would also increase social problems such as crime and cause political instability (*ibid*). Hence, it is not surprising that job creation was regarded as the top priority by survey respondents in the aftermath of the pandemic. Regarding taxes, China's central and local governments put forward a series of policies to support businesses during the pandemic and ease some of their compliance burdens, many of which involved exemptions from taxes, tax reductions and delays in paying tax. For example, the Ministry of Commerce announced in February that from 1 March 2020 to 31 May 2020, taxpayers in Hubei Province would be exempted from VAT if their tax rate was set at 3%, and small-scale taxpayers in other regions would pay a lower rate of 1% on taxable sales revenue if their VAT rate was set at 3% (MCC, 2020). Premier Li Keqiang said in May that the government would continue to lower the VAT rate and the pension insurance rate for enterprises and cut taxes and fees by about RMB 5 billion (USD 70 billion), and the payment of income tax by small and micro-businesses would be postponed to 2021 (China State Council, 2020). With 61.2% of the respondents being from small and micro-businesses (Table 1), paying tax would be one of the first things they would do once the pandemic was over. Nonetheless, even with the above post-pandemic priorities, ensuring corporate integrity (4.63, Table 8), complying with the law and regulations (4.62) and having in place a workplace health and safety plan (4.47) remain the essentials for Chinese businesses after COVID-19, just as they were during the pandemic.

The diagonal bars in Fig. 4 show that for the period between pre-pandemic and post-pandemic, job creation (0.883), protecting biodiversity (0.815) and having in place a workplace health and safety plan (0.809) are the top three in terms of their mean change of perceived importance, indicating their prioritized position in a longer term after COVID-19. Indeed, given the major impact COVID-19 has had on the Chinese economy and society,

Table 8 Welch's ANOVA test on mean difference among CSR indicators for each stage of COVID-19

COVID-19 stage	CSR indicator	Mean score	Statistic ^a	df1	df2	Sig
Pre	1. Complying with the law and regulations	4.29	156.776	12	5863.680	***
	2. Ensuring corporate integrity	4.26				
	3. Respecting ethical norms	3.98				
	4. Anti-corruption	3.87				
	5. Profit-making and wealth creation	3.71				
	6. Having a workplace health and safety plan	3.66				
	7. Protecting the environment and using clean resources	3.64				
	8. Ensuring equal pay for equal work	3.61				
	9. Paying taxes	3.37				
	10. Opposing employment discrimination	3.32				
	11. Protecting biodiversity	3.29				
	12. Job creation	3.24				
	13. Engaging in philanthropic activities and community service	3.21				
Mid	1. Complying with the law and regulations	4.50	126.653	12	5862.321	***
	2. Ensuring corporate integrity	4.48				
	3. Having a workplace health and safety plan	4.37				
	4. Respecting ethical norms	4.27				
	5. Anti-corruption	4.14				
	6. Protecting the environment and using clean resources	4.08				
	7. Profit-making and wealth creation	4.03				
	8. Ensuring equal pay for equal work	3.98				
	9. Protecting biodiversity	3.83				
	10. Engaging in philanthropic activities and community service	3.76				
	11. Job creation	3.75				
	12. Opposing employment discrimination	3.75				
	13. Paying taxes	3.62				

Table 8 (continued)

COVID-19 stage	CSR indicator	Mean score	Statistic ^a	df1	df2	Sig
Post	1. Ensuring corporate integrity	4.63	87.024	12	5861.215	***
	2. Complying with the law and regulations	4.62				
	3. Having a workplace health and safety plan	4.47				
	4. Respecting ethical norms	4.44				
	5. Anti-corruption	4.35				
	6. Protecting the environment and using clean resources	4.31				
	7. Profit-making and wealth creation	4.28				
	8. Ensuring equal pay for equal work	4.19				
	9. Job creation	4.12				
	10. Protecting biodiversity	4.11				
	11. Engaging in philanthropic activities and community service	4.01				
	12. Paying taxes	3.99				
	13. Opposing employment discrimination	3.97				

N = 1161; Mean score: 1 is the least important, 5 is the most important; a: Asymptotically F distributed

***: significant at $p < 0.01$

creating jobs and thereby addressing the problem of unemployment is not only an urgent need but also a long-term strategy for China. Of course, lessons have been learnt from the pandemic and protecting biodiversity and having a healthy and safe workplace environment would have to be prioritized in order to achieve successful businesses recovery and ensure a safe living environment.

Clearly neither wealth creation nor environmental protection and using clean energy are in the top three priorities of the companies (Table 9). It may be understandable that people would downplay the importance of wealth creation during the pandemic and indeed after the pandemic during recovery, but the reasons for it not being regarded as one of the top three business essentials during the pre-pandemic period is not so clear. In fact, wealth creation was rated as the 5th in terms of importance during the pre-COVID-19 period after complying with the law and regulations, ensuring corporate integrity, respecting ethical norms and anti-corruption (Table 8). However, one of the company owners in a telephone interview noted that while making money is always seen as important, what is more important is the need to comply with the law and regulations and ensure corporate integrity. However, once survival is no longer an issue, he noted that having a good business environment would become more urgent as this is the basis for sustainable and long-term development. This point may explain why the mean scores for the importance of complying with the law and regulations, ensuring corporate integrity, respecting ethical norms and anti-corruption are higher than that for wealth creation before COVID-19. Indeed, it was reported that China's anti-corruption efforts, which began in 2012, have proved to be successful in promoting corporate innovation, especially for non-SOEs, because they guarantee a better business environment (Gan & Xu, 2019). Given that only 16.8% of the survey respondents were from SOEs, it is logical that anti-corruption may be considered by most respondents in the survey as more essential than wealth generation.

Protecting the environment and using clean energy are also not CSR priorities in Table 9, even though COVID-19 has focused attention on the importance of protecting biodiversity. This resonates with Zambrano-Monserrate et al. (2020) finding that although forced lockdown has improved air quality, cleaned the beaches and reduced environmental noise, it has led to the neglect of other aspects of environmental protection and the result has been, for example, a reduction in the rate of recycling and an increase in waste.

5 Policy and managerial implications

The research reported here contributes to the scientific literature of the impact of COVID-19 by adding an empirical investigation of the changes in SD and CSR priorities due to COVID-19 in China. The findings have implications for company managers and policy makers. First, the results confirm the post-pandemic concern of an environmental rebound effect whereby the priority shifts to economic and social dimensions of SD to help provide urgent support for businesses and communities. To avoid the post-pandemic environmental rebound effect and ensure a green recovery, Chinese companies need to act now. Although many of them have realized the importance of protecting biodiversity over the longer-term following the pandemic, special attention needs to be paid to environmental protection and the use of clean energy. In this regard, an employee-centric approach, as suggested by Aguinis et al. (2020), might be more effective as it motivates and empowers employees and other stakeholders to pursue sustainable development goals and help them integrate these goals into their daily work routines. This would make environmental protection and the use

Fig. 4 Mean increase of CSR initiatives during and post COVID-19 comparing to the previous stage

of clean energy everyone's job rather than just the job of those who work in the SD/CSR department.

Second, Chinese companies have realized the importance of job creation and having in place a workplace health and safety plan as their long-term strategy of getting used to the 'new normal' (living with the virus) after the pandemic. Hence, more 'genuine and authentic CSR' should be at the heart of Chinese companies' post-pandemic CSR strategy, which would help the companies build stronger rapport among stakeholders and the general public, and ultimately help them recover quickly. Indeed, apart from charity donations provided by Chinese companies at the beginning of the crisis, some companies switched to production lines that could offer immediate help and assistance in the fight against the virus. For example, some Chinese manufacturing companies transformed their factories to produce ventilators, masks, hand sanitizer and so on. Telecom companies offered free internet access to students living in the remote rural areas, so they could continue to take online classes. The 14th FYP calls for similar initiatives, especially in the areas of agricultural modernization and rural poverty alleviation. Hence, in the future, Chinese companies should not only support rural areas through donations but most likely leverage their professional advantages to help poorer regions create economic value.

In addition, protecting the environment and using clean energy was not reported as a CSR priority by respondents, even though protecting biodiversity as part of environmental protection would seem to be prioritized in response to COVID-19. This raises a concern over the post-pandemic environmental rebound effect and highlights a dilemma that China, and possibly other countries, face in the post-pandemic era. While the short-term lockdown benefits of a CO₂ reduction may well fade, it may be that environmental issues are neglected at least over the medium term as priorities shift. To date there has been no mention by the Chinese government of the need for environmental protection and using renewable resources after the pandemic although a series of policy changes have been made to ban the wildlife trade even if there are still 'legal loopholes' as noted by Grace Ge Gabriel, Asia regional director for the International Fund for Animal Welfare (Shepherd & Liu, 2020).

Table 9 Summary of top CSR priorities and basis for three stages of COVID-19

COVID-19 stages	CSR priority			CSR essential		
	1 st	2 nd	3 rd	1 st	2 nd	3 rd
Pre	N/A	N/A	N/A	Comply with law and regulations	Ensure corporate integrity	Respect ethical norms
Mid	Workplace health and safety	Philanthropy and community service	Protecting biodiversity	Comply with law and regulations	Ensure corporate integrity	Workplace health and safety
Post	Job creation	Paying tax	Protecting biodiversity	Ensure corporate integrity	Comply with law and regulations	Workplace health and safety
Vs. mid Vs. pre	Job creation	Protecting biodiversity	Workplace health and safety			

Furthermore, the need to comply with the law and regulations and ensuring corporate integrity are the ingrained values of Chinese businesses before, during and post the pandemic, which might have been the reason that Chinese companies resisted the temptation to take advantage of consumers' need for hedonic gratification at the beginning of the pandemic (He & Harris, 2020). As He and Harris (2020) have noted, in the post-pandemic era companies should engage in socially responsible marketing to help promote socially responsible consumption and resist unethical business practice during the crisis.

6 Conclusion

The research reported in this paper has outlined the perceived priority changes of businesses within SD and CSR in the three periods (pre, during and post) of COVID-19 in China and is the first study of its type to explore changes in these priorities as a result of the pandemic. However, the research does have limitations, for example, only the perceived views of the importance of each dimension of SD, and each indicator of CSR is reported. Further research should look at the actual activities that companies engaged in the SD and CSR area and the change of activities caused by COVID-19. Secondly, SD and CSR priority changes as the result of COVID-19 across industries and cities would also be interesting to investigate. In this research there was no attempt to focus on a comparison between industries or cities, but this is an aspect that could be pursued in future work. In addition, there is always a danger of assuming cause effect regarding changes in SD and CSR and the progression of the COVID-19 pandemic. While COVID-19 has provided a profound shock for business in China, including the various policy interventions from government that were introduced to cope with the pandemic, could it not be that these shifts in perspective were likely to happen in the first half of 2020 in any case? Hence the results should perhaps be seen more as indicative than definitive as other forces besides COVID-19 could be at play, but nonetheless they do chart a change in perspective over what is a significant shock to the business environment.

Four research questions have been addressed by the research. Results suggest that CSR is not taking a backseat in China due to COVID-19, but the environmental aspect has become less important and less prioritized during the pandemic as well as over the longer term in the post-pandemic era. Hence, a post-pandemic environmental rebound effect is possible but could be averted if actions are taken now. However, COVID-19 has to some extent led to more genuine and authentic CSR, although whether this will contribute to addressing global social and environmental challenges still remains a question that needs to be answered especially as economic growth is still considered essential by many Chinese companies during and post the pandemic.

A more sustainable post COVID-19 China should be more resilient to not only global challenges such as pandemics, but also to climate change and other stresses and shocks. Hence, the more relevant and pressing question is not about whether to invest in CSR or not, but more about how best to invest in CSR so as to achieve a delicate balance between profitability and harmony between various stakeholders. Given the growing financial burdens caused by COVID-19, if SD is to be revived as a development objective, then companies in countries such as China should invest in a more cost-effective way so as to achieve long-term sustainability after the pandemic (Barbier & Burgess, 2020). Government intervention plays an important role in channeling such effort, and a number of instruments may be available such as swapping fossil fuel subsidy to clean energy investment fund,

irrigation subsidies to waste supply, sanitation and wastewater infrastructure improvement fund and a fossil fuel levy to fund natural climate solutions as suggested by Barbier and Burgess (2020). Time will tell whether such interventions are taken seriously.

Author's contribution DZ contributed to the study conception and design, data analysis. Data collection was performed by DZ, SL and LL. The first draft of the manuscript was written by DZ, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding This research was funded by the Department of Science and Technology of Henan Province, grant number: 202400410096.

Availability of data and material Data are available upon request.

Declarations

Conflicts of interests The author declares that they have no conflict of interests.

References

- Adhikari, S., Meng, S., Wu, Y., Mao, Y., Ye, R., Wang, Q., Sun, C., Sylvia, S., Rozelle, S., Raat, H., & Zhou, H. (2020). Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: A scoping review. *Infectious Diseases of Poverty*, 9, 29. <https://doi.org/10.1186/s40249-020-00646-x>
- Aguinis, H., Willamor, I., & Gabriel, K. P. (2020). Understanding employee responses to COVID-19: A behavioural corporate social responsibility perspective. *Management Research: The Journal of the Iberoamerican Academy of Management*. <https://doi.org/10.1108/MRJIAM-06-2020-1053>
- Barbier, E. B., & Burgess, J. C. (2020). Sustainability and development after COVID-19. *World Development*, 135, 105082. <https://doi.org/10.1016/j.worlddev.2020.105082>
- Barreiro-Gen, M., Lozano, R., & Zafar, A. (2020). Changes in sustainability priorities in organizations due to the COVID-19 outbreak: Averting environmental rebound effects on society. *Sustainability*. <https://doi.org/10.3390/su12125031>
- Behringer, K., & Szegedi, K. (2016). The role of CSR in achieving sustainable development—theoretical approach. *European Scientific Journal*, 12, 10–25.
- Biswas, A., Tortajada, C. (2020). The evolution of Chinese corporate social responsibility. Retrieved 31 May 2021 from <https://www.chinawaterrisk.org/opinions/the-evolution-of-chinese-corporate-social-responsibility/>
- Bryman, A., Bell, E., & Teevan, J. J. (2012). *Social research methods* (3rd ed.). Oxford University Press.
- Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Business Horizons*, July–August, 39–48.
- Celik, N. (2020). Welch's ANOVA: Heteroskedastic skew-t error terms. *Communications in Statistics—Theory and Methods*. <https://doi.org/10.1080/03610926.2020.1788084>
- Centre for Strategic and International Studies (CSIS). (2020). Chinese philanthropists rush to respond to COVID-19. Retrieved 10 November 2020, from <https://www.csis.org/blogs/trustee-china-hand/chinese-philanthropists-rush-respond-covid-19>.
- China State Council. (2020). The government work report. Retrieved 10 November 2020 from <http://www.gov.cn/zhuanti/2020lhzfzbg/index.htm>.
- Delacre, M., Leys, C., Mora, Y. L., & Lakens, D. (2019). Taking parametric assumptions seriously: Arguments for the use of Welch's F-test instead of the classical F-test in one-way ANOVA. *International Review of Social Psychology*, 32(1), 13. <https://doi.org/10.5334/irsp.198>
- Fraser, N., & Sinfeld, A. (1985). The cost of high unemployment. *Social Policy Administration*. <https://doi.org/10.1111/j.1467-9515.1985.tb00223.x>
- Freire-Gonzalez, J., & Vivanco, D. F. (2020). Pandemics and the environmental rebound effect: Reflections from COVID-19. *Environmental and Resource Economics*, 76, 447–517. <https://doi.org/10.1007/s10640-020-00448-7>

- Gan, X., & Xu, X. (2019). Does anti-corruption campaign promote corporate R&D investment? Evidence from China. *Finance Research Letters*, 30, 292–296. <https://doi.org/10.1016/j.frl.2018.10.012>
- Gao, H., & Ren, M. (2020). Overreliance on China and dynamic balancing in the shift of global value chains in response to global pandemic COVID-19: An Australian and New Zealand perspective. *Asian Business & Management*. <https://doi.org/10.1057/s41291-020-00121-3>
- Garcia-Sanchez, I., & Garcia-Sanchez, A. (2020). Corporate social responsibility during COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.3390/joitmc6040126>
- Haak-Saheem, W. (2020). Talent management in COVID-19 crisis: How Dubai manages and sustains its global talent pool. *Asian Business & Management*. <https://doi.org/10.1057/s41291-020-00120-4>
- He, H., & Harris, L. (2020). The impact of COVID-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research*, 116, 176–182. <https://doi.org/10.1016/j.jbusres.2020.05.030>
- Hofman, P. S., Moon, J., & Wu, B. (2017). Corporate social responsibility under authoritarian capitalism: Dynamics and prospects of state-led and society-driven CSR. *Business & Society*, 56, 651–671.
- Honey-Roses, J., Anguelovski, I., Bohigas, J., Chireh, V., Daher, C., Konijnendijk, C., Litt, J.S., Mawani, V., McCall, M.K., Orellana, A., Oscilowicz, E., Sánchez, U., Nieuwenhuijsen, M. (2020). The Impact of COVID-19 on public space: A review of the emerging questions. *Cities and Health*. <https://doi.org/10.1080/23748834.2020.1780074>
- Li, K., Khalili, N. R., & Cheng, W. (2019). Corporate social responsibility practices in China: Trends, context, and impact on company performance. *Sustainability*, 11, 353. <https://doi.org/10.3390/su11020354>
- Li, Y., Cheng, H., Beeton, R. J. S., Sigler, T., & Halog, A. (2016). Sustainability from a Chinese cultural perspective: The implications of harmonious development in environmental management. *Environment, Development and Sustainability*, 18, 679–696.
- Liu, Y., Lee, J. M., & Lee, C. (2020). The challenges and opportunities of a global health crisis: The management and business implications of COVID-19 from an Asian perspective. *Asian Business & Management*. <https://doi.org/10.1057/s41291-020-00119-x>
- Mandal, I., & Pal, S. (2020). COVID-19 pandemic persuaded lockdown effects on environment over stone quarrying and crushing areas. *Science of the Total Environment*, 732, 139281. <https://doi.org/10.1016/j.scitotenv.2020.139281>
- McCloskey, B., Heymann, D. L. (2020). SARS to novel coronavirus—old lessons and new lessons. *Epidemiol Infection*, 148, E22. <https://doi.org/10.1017/S0950268820000254>
- Ministry of Commerce of China (MCC). (2020). Retrieved 10 November 2020 from http://szs.mof.gov.cn/zhengcefabu/202002/t20200228_3475718.htm.
- National Bureau of Statistics of China (NBSC) (2020). National economy continues its recovery in July. Retrieved 10 November 2020 from http://www.stats.gov.cn/tjsj/zxfb/202008/t20200814_1783045.html.
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Losifidis, C., Agha, M., & Agha, R. (2020). The Social-economic implications of the coronavirus and COVID-19 pandemic: A review. *International Journal of Surgery*. <https://doi.org/10.1016/j.ijsu.2020.04.018>
- Noronha, C., Tou, S., Cynthia, M. I., & Guan, J. J. (2012). Corporate social responsibility reporting in China: An overview and comparison with major trends. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.1276>
- Palma-Ruiz, J. M., Castillo-Apraiz, J., & Gomez-Martinez, R. (2020). Socially responsible investing as a competitive strategy for trading companies in times of upheaval amid COVID-19: Evidence from Spain. *International Journal of Financial Studies*. <https://doi.org/10.3390/ijfs8030041>
- Quere, C. L., Jackson, R. B., Jones, M. W., Smith, A. J. P., Abernethy, S., Andrew, R. M., De-Gol, A. J., Willis, D. R., Shan, Y., Canadell, J. G., Friedlingstein, P., Creutzig, F., & Peters, G. P. (2020). Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement. *Nature Climate Change*, 10, 647–653. <https://doi.org/10.1038/s41558-020-0797-x>
- Shen, A. (2020). How could COVID-19 change philanthropy in China? Retrieved 10 November 2020 from <https://avpn.asia/blog/how-could-covid-19-change-philanthropy-in-china/>.
- Shepherd, C., Liu, Q. (2020). Will Covid-19 tame China's wildlife trade? Retrieved 10 June 2021 from <https://www.ft.com/content/55b2f73f-c05f-4faf-ba89-1af0c082644b>
- Sun, J., Zhuang, Z., Zheng, J., Li, K., Wong, R.L.-Y., Liu, D., Huang, J., He, J., Zhu, A., Zhao, J., et al. (2020). Generation of a broadly useful model for COVID-19 pathogenesis, vaccination, and treatment. *Cell*, 182, 734–743.
- Wiersinga, W. J., Rhodes, A., Cheng, A. C., Peacock, S. J., & Prescott, H. C. (2020). Pathophysiology, transmission, diagnosis, and treatment of Coronavirus Disease 2019 (COVID-19): A review. *JAMA*, 324, 782–793.

- World Business Council for Sustainable Development (WBCSD), (2017). The reporting exchange: An overview of sustainability and corporate reporting in China. Retrieved 31 May 2021 from https://www.cdbsb.net/sites/default/files/cdbsb_case_study_china.pdf
- World Health Organization (WHO) (2020). WHO Coronavirus Disease (COVID-19) Dashboard. Retrieved 10 June 2021 from https://covid19.who.int/?gclid=EAIaIQobChMIzqaup7iF6wIVibPtCh0s7Az uEAAYASAAEgLJ2fD_BwE.
- Xinhua News Agency (2021). The 14th five-year plan for the national economic and social development of the People's Republic of China and the outline of the long-term goals for 2035. Retrieved 31 May 2021 from http://www.gov.cn/xinwen/2021-03/13/content_5592681.htm
- Yoshikawa, T., & Chua, G. (2020). COVID-19 and Japanese shareholder activism: Brief respite for Japan's self-healing concrete. *Asian Business & Management*. <https://doi.org/10.1057/s41291-020-00122-2>
- Zambrano-Monserrate, M. A., Ruano, M. A., & Sanchez-Alcalde, L. (2020). Indirect effects of COVID-19 on the environment. *Science of the Total Environment*, 728, 138813.
- Zhai, P., Ding, Y., Wu, X., Long, J., Zhong, Y., & Li, Y. (2020). The epidemiology, diagnosis and treatment of COVID-19. *International Journal of Antimicrobial Agents*, 55, 105955.
- Zhang, D., Hao, M., & Morse, S. (2020). Is environmental sustainability taking a backseat in China after COVID-19 The perspective of business managers. *Sustainability*. <https://doi.org/10.3390/su122410369>
- Zhang, D., Morse, S., & Kambhampati, U. (2018). *Sustainable development and corporate social responsibility*. Routledge.
- Zhou, P., Yang, X., Wang, X., Hu, B., Zhang, L., Zhang, W., Si, H., Zhu, Y., Li, B., Huang, C.-L., Chen, H.-D., Chen, J., Luo, Y., Guo, H., Jiang, R.-D., Liu, M.-Q., Chen, Y., Shen, X.-R., Wang, X., ... Shi, Z. (2020). A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579, 270–273.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.