

The Impact of Social Networks on Public Opinion and Economic Behavior During COVID-19: A Comparative Analysis of China and the United States

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Abstract: The Covid-19 pandemic has had a significant impact on the world's economic behavior, including China and the United States. Social networks then played an important role both in the spread of the virus and in information diffusion. However, there are limited studies explaining the impact of social networks along with an analysis of public opinion and economic behavior during the COVID outbreak. Therefore, this study aims to investigate the relationship by comparing the different situations in China and the United States and analyzing different economic recovery strategies used to reduce dramatic economic contraction. The study started with a brief explanation of the concept of social networks and their relation with the transmission of Covid-19. Then, it is split into two sections to focus deeper on how social networks relate to each country in the spread of COVID-19. Lastly, the differences in the policies implemented to stimulate economic activity are analysed.

Keywords: Covid-19 Pandemic, Social networks, Social media, Economic activity

1. Introduction

Circulating the world for almost four years since 2020, Coronavirus Disease 2019 (COVID-19) has been impacting the whole of humanity. It is a respiratory disease with symptoms similar to flu, causing infected people to mistreat it. Due to the misjudgment at first, the human-to-human transmission caused clusters of pneumonia cases of unknown etiology to be found in Wuhan City, Hubei Province, China [1]. By January 23, 2020, Wuhan was placed under lockdown, but it did not stop the spread of the disease. On February 10, 2020, the number of confirmed cases in China exceeded 42,500 [2]. On March 11, 2020, the World Health Organisation (WHO) announced that there were more than 118,000 cases and 4,291 deaths in 114 countries and declared COVID-19 as a pandemic [3].

As the number of cases continues to increase, corresponding measures such as quarantine, social distancing, and mask-wearing have also been taken to reduce a portion of the probability of getting infected. Information like this is often spread through social networks such as social media and each individual's social circle. Social media can be used to express public opinions as well as shape an individual's perception of related topics. Social networks also play an important role in the distribution of opportunities and resources in a social economy. Through social relationships between individuals, people can build social capital, which includes elements such as trust, cooperation, and information

sharing that play a crucial role in economic success. In certain contexts, social networks can also be seen as platforms that provide access to job opportunities, facilitate business partnerships, and uncover other economic opportunities. Thus, impacts a country's economy.

This study aims to identify how social networks impact public opinion and economic behaviour in China and the United States during the COVID-19 outbreak, which could be a reference for government officials and politicians to respond to crises and formulate more specific policies efficiently and effectively. The relevant concept of social networks and their relationship with the pandemic was first discussed, followed by a comparison of the US's and China's social networks in regard to preventing the spread of the disease. Lastly, different economic recovery strategies and their relationship with social networks are analyzed.

2. Literature Review

2.1. Concept of the Social Network

Social networks present as a set of nodes (individuals or entities) connected by one or more types of edges (relationships) [4]. Nodes may be persons, groups or other units, but the present focus is the connections between persons. Kadushin introduces the social network theory and some basic network concepts, which involve distance, position, density, network clusters, and social circles [5]. Complex networks are composed of smaller units that overlap one another, and this idea was first articulated by Simmel, who proposed that these smaller units be called "social circles" [5,6]. When the complexity of the network grows, the distance between nodes also increases. However, due to the small world theory, each individual can reach anyone else within five or six people when the nodes overlap, causing the nodes to have a high clustering [7]. Centola investigates the relationship between social networks and the spread of behavior by experimenting with the online health community [8]. The participants were randomly assigned into two different network structures: a clustered lattice network and a random network [8]. The result shows that individual adoption of the behavior was more likely in the clustered network since clustered ties provided social reinforcement, boosting the diffusion to be more influential and frequent across the network. This means that the position of an individual can also determine the network distance since higher centrality indicates a higher power, influence and convenience [9]. Therefore resulting in a shorter path length. The density of a network can be defined as the number of connections, either direct or indirect, within a group [5]. While an indirect connection is a path that connects A to B via C, a direct connection connects A directly to B [5]. Hence, social networks are extremely crucial in understanding information and behavior diffusion among social interactions.

2.2. The Connection between Covid-19 and Social Network

The social network is separated into two types: offline social networks and online social networks. Offline social networks typically indicate interpersonal networks and face-to-face interactions, which is extremely crucial in infectious disease transmission, especially when COVID-19 is a human-to-human transmission. Since social networks are heterogeneous in terms of degree distribution, a few individuals can establish and maintain tens of social connections while the majority only have a small number of social contacts [10]. This is known as hubs. Due to hubs, if the initial infectors are the central nodes, the diffusion of the disease is likely to be faster than those of peripheral nodes. However, unlike information diffusion that is spread through communicational networks, the coronavirus is disseminated through coughs or sneezes from the infected people, which greatly increases the probability for others to get infected [11]. Therefore, coinciding with the Chinese Spring Festival travel season, the coronavirus was massively spread throughout China. Also, due to the convenience of air travel, airline staff, diplomatic personnel, students, tourists, and migrants provide bridges for

the virus to spread between networks in different societies, causing a world pandemic and an emergence of lockdowns [3,12]. In addition to physical social networks, online social networking sites also play a crucial role in the understanding of COVID-19. Social media platforms, such as Twitter or Facebook, provide rapid information dissemination about disease-related information, behavior change, or even misinformation [13]. New policies or urgent requirements from the government are also published through social networking sites for the public to view and respond to. Therefore, people can instantly take corresponding actions, such as quarantine, vaccination and mask-wearing, to prevent getting infected by COVID-19 while protecting others' safety.

3. Social Networks and the Covid-19 Pandemic in the US

People in the United States are often believed to have more freedom, both online and offline. When the directors of the Centers for Disease Control and Prevention (CDC) proposed new measures on social media to prevent COVID-19, such as wearing face masks, most US citizens followed the rules to protect themselves and others from getting sick. However, studies have also shown that not all states in the US have mandatory COVID-19 prevention measures. The first wave of COVID-19 started in April 2020 and continued until June 2020, and approximately all states implemented relevant policies to prevent COVID-19 during this period (see Figure 1) [14,15]. Nevertheless, starting from August 9, 2020, only around 30 of the states maintained the face mask policy, and nearly no states required restaurant closures, increasing the probability of physical, and social interactions among individuals. The second wave started from late November 2020 to early February 2021, showing a slight increase in the number of states that implemented the policies [14]. This shows that the United States did not take the COVID-19 pandemic seriously enough to force its citizens to take corresponding actions to prevent the spread of the virus. Due to the information diffusion on social media, it is easier for citizens in different states to be updated with the newest policies that each state implements. When other states do not require face mask mandates or social distancing, but their own states still have corresponding measures, the difficulty of policy implementation will increase. Therefore, social networks can also limit the execution of new policies and law-enforcements.

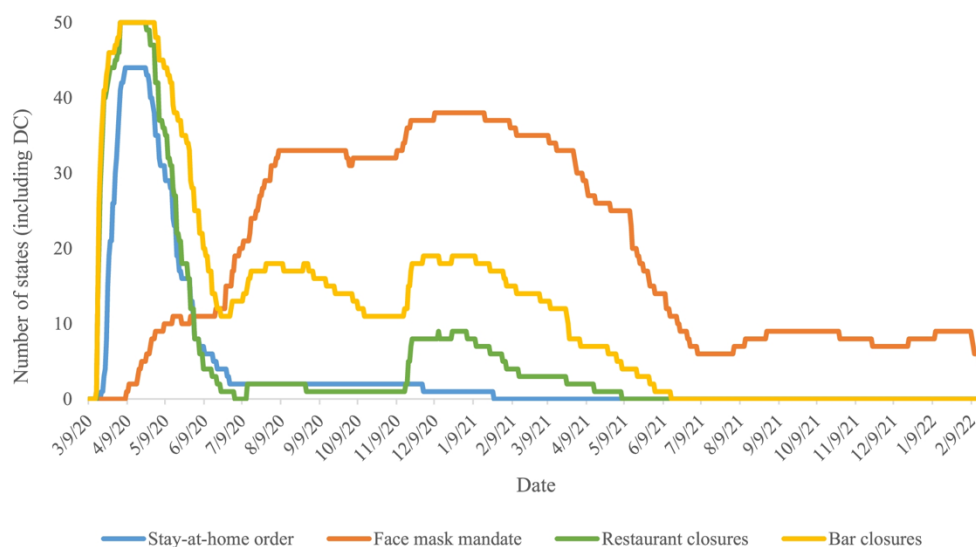


Figure 1: The number of states that implemented policies to prevent the spread of Covid-19 [15].

Moreover, public speeches from government officials highly correlate with public opinion and COVID-19 transmission through social networks. In 2020, Donald Trump, the United States' 45th President, claimed that COVID-19 was "no worse than seasonal flu", and his mocking of citizens who

wear a mask weakened public obedience to the orders from the US administration [16,17]. Under the influence of social media, this "Trumpism" has further contributed to the reason that some US citizens have an anti-mask attitude during the COVID-19 pandemic. Another reason they refused to wear masks and follow other 'extreme' policies, such as stay-at-home orders, is American individualism. Americans believe that they have both the freedom and responsibility to manage their own lives and make their own decisions [18]. Therefore, when the state government announced stay-at-home orders to prevent the COVID-19 pandemic from being disseminated, hundreds and thousands of people protested, saying that the governments had overreacted and calling them a "tyranny" since they also mandated healthy citizens to stay at home [19,20,21]. This massive act of protest was favored by the disease, causing people to have more physical contact with each other and boosting the dispersion of the coronavirus through offline interpersonal social networks.

4. Social Networks and the Covid-19 Pandemic in China

Being the most populated country in the world, China has a population of 1.42 billion, which indicates a much more complex and denser social network for COVID-19 to spread [22]. The denser the network, the faster the diffusion. Therefore, China was very strict about Covid-related policies as they matter to its citizens' health. Other than lockdowns, the Chinese government used the influence of social networking sites to alert and inform their citizens of the importance of hygiene and preventive measures to fight through the pandemic. In less than two weeks, from the Luna New Year (January 24, 2020) to February 5, 2020, COVID-related propaganda and charitable videos have been put on the newspaper, TV, social media sites, mobile propaganda trucks, street speakers, and other forms to provide a positive influence for Chinese citizens [23]. The television station of Zhengzhou City, Hunan Province, also proposed a series of reality shows and 12 hours of live video to release authoritative information in a timely manner and enhance public COVID-19 prevention knowledge [24]. The viewership of the live video exceeded 6.08 million, reflecting an effective information diffusion through social media networking [24].

Moreover, the Chinese government was also strict offline to avert human-to-human transmission by implementing social distancing, presenting the updated health code when entering enclosed spaces, requiring a COVID test every three days, and mandating the face mask policy. Government officials have announced that those who do not choose to cooperate may be alleged infringement, which could result in up to 10 days of detention and a 500 yuan fine [25]. This forced the Chinese citizens to obey the new measures. However, even though many people were annoyed and became impatient to follow the directions, it had a significant effect on the number of people infected by the Coronavirus. Research has shown that the cumulative number of deaths in China at the start of 2023 is 5235 cases, indicating that in one million people, there are 3.7 deaths [26]. However, the United States has a cumulative death toll of nearly 1.1 million cases, with 3214.4 deaths per million people [26]. If the per capita death rate in China is the same as that in the US, then the death toll in China would be over 4.5 million cases instead of 5235 cases [26]. This is due to the dense population and social network that China has, indicating a widespread occurrence of the COVID-19 disease if the government does not implement stringent measures.

However, depending on the situation, the news published by the Chinese media is selective. The Chinese government values its citizens' mental and physical health, hence neglecting the negative news reported on social media to maintain social stability during an outbreak. For instance, when Li Wenliang and other doctors in Wuhan City, Hubei Province, determined some ongoing pneumonia cases as the "SARS" virus that happened in 2003 and alerted their friends and families around their social circle, they were soon admonished by the Wuhan Police officials because they started a "rumor" [27]. However, after Doctor Li Wenliang claimed on social media Weibo, that himself has infected with the pneumonia disease, this event went viral, causing a majority of the public to be anxious as

they recalled the 2003 SARS pandemic and worried about their safety [27,28,29]. A few days later, noticing that Doctor Li Wenliang had passed away due to the virus, the public had a skeptical and unsatisfied attitude towards the Wuhan government officials, saying that the prevention and control measures were not good enough [27,28]. To control public opinion, the Chinese government then used the functions on Weibo to block the keywords related to Doctor Li Wenliang so that the public could not search for any information that was relevant to this event. Also, other than masking keywords to avoid negative news, they require the media to refuse the use of "extreme" language, such as "cannot be cured", "mortal", or "deadly", to prevent social panicking [30]. This stopped the spread of negative information so that Chinese citizens could be confident in fighting through the pandemic.

5. Difference Analysis: The Role of Social Networks in Economic and Social Behavior

5.1. Difference Analysis 1

China's response to COVID-19 and economic recovery speed is faster than the US in every aspect. In economics, consumption, investment and exports are often referred to as the "three engines" that drive economic growth [31]. However, since many countries' borders are closed, affecting international trade and investments, consumption becomes especially important. Therefore, due to the competitive advantage in its population, domestic demand in China has effectively increased its economic dynamic. For example, During COVID-19, there has been a rise in industry innovations and the development of technology [31]. This includes an explosive demand in potential areas such as smart manufacturing, unmanned delivery, e-learning, digital entertainment, virtual healthcare and e-commerce [31,32,33,34,35]. As there are more people in China, the demand for these online services has increased, causing the supply and China's Gross Domestic Product (GDP) to rise [33]. However, the US population is fewer than China's population, indicating less domestic consumption to support the economy. Therefore, the US has faced a trade deficit in the past ten years and even became worse throughout the COVID outbreak, reducing from \$-845.76 billion in 2019 to \$-1,177.37 billion in 2022 (see Figure 2) [34,35]. This is because many countries that import from the US have not recovered, meaning that the goods and services provided by the US cannot be exported. Hence, to increase the number of exports and stimulate economic activity, the US Reserve Bank lowered the interest rate [36].

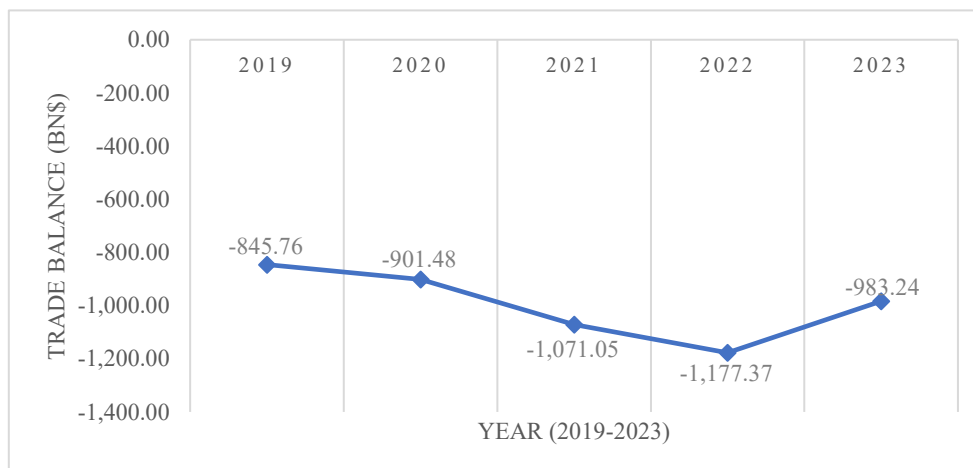


Figure 2: Trade balance of the US (2019-2023) [35].

5.2. Difference Analysis 2

Due to the Covid-19 pandemic, the most affected industry around the world are tourism and travel, as it highly relies on personal interactions. Before the COVID-19 pandemic, Chinese tourists were on the rise in Asian and global tourism [37]. However, due to lockdowns in China, Chinese people could hardly travel abroad, causing a decrease in every country's economy in the tourism industry, including China itself. In 2019, the tourism industry in the US contributed 2.99% to the US GDP and nearly decreased by half in 2020 with a contribution of 1.54% [38]. Unsurprisingly, it has caused a reduction in the US GDP from 21.38 trillion dollars to 20.06 trillion dollars [39]. In the meanwhile, China's tourism industry has contributed to the economy by 4.56% in 2019 and only decreased by 0.55% in 2020 [39,40]. However, during the COVID-19 outbreak, China's GDP did not decrease but increased, indicating a success in its COVID-19 prevention to avoid dramatic economic contraction [33]. Except for the "Zero case" policy that was applied, the implementation of domestic demand has also benefited China's economy. Since the Covid lockdown and international tourism cannot be recovered immediately, the Chinese tourism businesses brought some new mechanisms to make profits. For example, on September 10, 2020, the Forbidden City in Beijing cooperated with the media to open digital tourism through live streams and sold souvenirs to the public, fulfilling people's demand for travel consumption [41]. Therefore, with social networks' influence, people can access a diverse array of local products without the necessity of physical presence. Furthermore, after the pandemic was under control, the government then implemented recovery strategies to reverse the development of the tourism market [42]. During 2020, many travel destinations required early bookings and personal health codes to limit clustering and hence the social contact that may increase the spread of the Coronavirus [43]. Consequently, this led to a rebound in domestic tourism in mid-2020 (see Figure 3) [44]. Also, after the reopening of the border at the end of 2022, advertisements on different travel destinations were widely spread. From the leisure life in Yunnan Province that went viral on March 2023 with a viewership of more than 21 billion to the "winter wonderland" in Harbin City promoted at the end of 2023 [43]. It has become a new trend in Chinese domestic tourism, causing a rocketed increase in the domestic tourism economy from early 2023 to now.

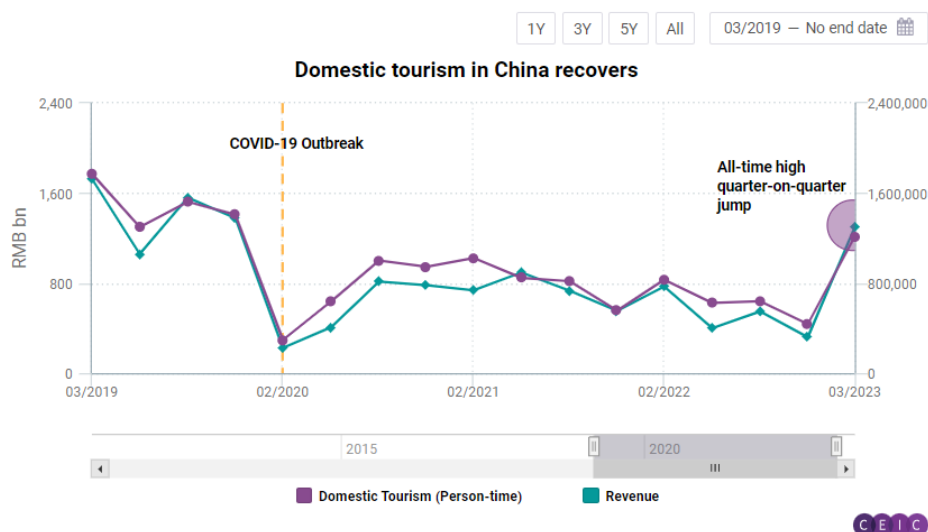


Figure 3: Contribution of China's domestic tourism to its economy [44].

However, as mentioned above, the travel and tourism industry in the US economy in 2020 has decreased by half of 2019's contribution. Although the US has a strong domestic market, the US Travel Association has said that it is not expected to reach the pre-pandemic level until 2023 [45].

This is because the US was not as strict as China in preventing disease transmission, causing the US to fight the Coronavirus while managing the reopening of the tourism economy. A strategy that they used to help the international and domestic travel industry is giving funds. In the American Rescue Plan Act of 2021, a grant of \$8 billion was provided to airports to help with debt and operations costs, \$15 billion to support the airline payroll and another \$350 billion to the U.S. Economic Development Administration for local states and governments to act to the economic injury caused by COVID-19 [46]. Other grants were also given for the resumption of marketing and promotion to inbound and outbound travelers [47]. However, even with the grants provided, the amount of money spent on travel advertisements during the COVID-19 pandemic was far below the pre-pandemic period (see Figure 4) [48]. Therefore, even though the US border was not closed, the marketing strategies on social networks did not have a significant effect on the US economy. Consequently, this has caused the contribution of the travel and tourism industry to only experience a gradual increase in the US GDP, rising from 1.54% in 2020 to 2.15% in 2021 [38].

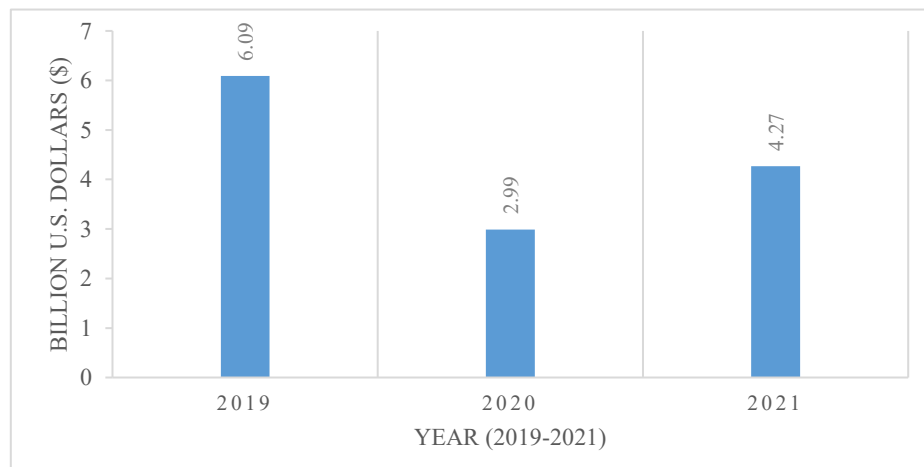


Figure 4: Digital advertising spending in the US travel industry from 2019 to 2021 [48].

6. Conclusion

From the health of an individual to the economy of a country, COVID-19 transferred through social networks has deeply impacted the whole world. Due to social networks, COVID-related information and preventive measures have been effectively disseminated, both in China and the United States. China, on the one hand, implemented harsher policies to avoid the spread of the disease since they have a denser network. This resulted in stable and moderate economic growth during 2020 and continues to rise later on. However, although the Chinese media often blur the truth on related news for the public to have a positive attitude toward fighting the pandemic, the Chinese citizens were anxious, worried, and depressed after learning the truth. On the other hand, the US tried to control the diffusion but failed as the US citizens protested to express their value on personal freedom, causing the coronavirus to spread throughout the network. Therefore, the economic impact that COVID-19 has strongly correlates with the policies and mechanisms that the government used to minimize dramatic economic contraction. For China, this includes industry innovations and the widespread of local tourism destinations through marketing strategies to increase domestic demand and consumption. For the US, this indicates lowering the interest rate to enhance US exports and provide funds for related industries. However, the result shows that the US economy in 2020 declined and the trading balance continued to be in deficit status.

This study not only investigated the relationship between online and offline social networks and the impact of COVID-19 on economic activities, but also two diverse countries' public opinions

toward the pandemic, allowing a cross-cultural analysis and a comparison between different recovery strategies. A limitation of this study is the number of countries that were examined, which only allows an analysis of public opinions from two cultures. Therefore, future studies could delve deeper into cross-cultural variations in influencing public attitudes and behaviors that could impact economic growth.

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