Does a competitive business strategy make firms more resilient? Evidence from the COVID-19 pandemic

Une stratégie commerciale compétitive rend-elle les entreprises plus résilientes ? Évidence tirée de la pandémie de COVID-19

Hace una estrategia empresarial competitiva que las empresas sean más resilientes. Evidencia de la pandemia de COVID-19

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ABSTRACT

This paper examines the effects of COVID-19 and business strategy on the performance of Chinese-listed firms. Using a sample of 2,606 Chinese non-financial listed firms over 2010-2022, we provide evidence that the COVID-19 (business strategy) pandemic has a significant negative (positive) impact on firm performance and business strategy positively moderates the negative relationship of COVID-19 on firm performance. We further show that firms with a proactive business strategy had better resilience during the COVID-19 pandemic than firms with a defensive business strategy. We also find that these relationships are more pronounced for state-owned and large firms. Our results are robust to a battery of robustness tests and contribute to the growing debate on the role of business strategy during crises, offering insights to regulators and policymakers.

Keywords: COVID-19, Business strategy, Corporate resilience, Firm performance

Résumé

Cet article examine les effets du COVID-19 et de la stratégie commerciale sur la performance des entreprises chinoises. Avec un échantillon de 2 606 entreprises cotées sur 2010-2022, nous montrons que la pandémie (stratégie commerciale) a un impact négatif (positif) sur la performance des entreprises et que la stratégie commerciale modère positivement la relation négative entre le COVID-19 et la performance des entreprises. Nous montrons aussi que les entreprises adoptant une stratégie commerciale proactive ont mieux résisté à la pandémie que celles adoptant une stratégie défensive. Nous constatons également que ces relations sont plus marquées pour les entreprises d'État et les grandes entreprises. Nos résultats sont robustes à une série de tests et contribuent au débat sur le rôle de la stratégie commerciale en période de crise.

Mots-clés : COVID-19 ; Stratégie d'entreprise, Résilience des entreprises, Performance des entreprises

Resumen

Este artículo examina los efectos del COVID-19 y de la estrategia empresarial en el desempeño de las empresas chinas. Con una muestra de 2,606 empresas cotizadas durante el período 2010-2022, mostramos que la pandemia (estrategia empresarial) tiene un impacto negativo (positivo) en el desempeño de las empresas y que la estrategia empresarial modera positivamente la relación negativa entre el COVID-19 y el desempeño empresarial. También demostramos que las empresas que adoptaron una estrategia empresarial proactiva resistieron mejor a la pandemia que aquellas con una estrategia defensiva. Asimismo, observamos que estas relaciones son más pronunciadas en las empresas estatales y en las grandes corporaciones. Nuestros resultados son robustos a una serie de pruebas y contribuyen al debate sobre el papel de la estrategia empresarial en tiempos de crisis.

Palabras Clave: COVID-19, Estrategia empresarial, Resiliencia corporativa, Desempeño empresarial

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The global health impact of COVID-19 is enormous, with over 776 million confirmed cases and 7,068,677 deaths across the globe as of September 29th, 2024[1]. To protect public health, the intervention response to COVID-19 has caused a massive negative short-term impact on economies and is likely to have long-term economic and human losses. IMF has warned of unprecedented economic decline since the great depression (Georgieva, 2020). Globalization has enormously increased the interconnectedness and interdependence of different economies. Consequently, the contagious spread of COVID-19 is not only affecting the local economy but also enabling the contagious spread of economic malaises. Globally, COVID-19 has unprecedentedly eroded a quarter of gained wealth in the first month of the outbreak (Ali *et al.*, 2020) while differently affecting all sectors (Al-Awadhi *et al.*, 2020; Corbet *et al.*, 2020).

The pandemics have their social and economic costs as they can affect societies, organizations, and financial systems, challenging their resilience (Goodell, 2020). Resilience is defined as an entity's ability to survive when facing disruptions (Bhamra *et al.*, 2011; Van Der Vegt *et al.*, 2015). The survival of the organizations and the financial systems depends upon their resilience, specifically during pandemics (Bryce *et al.*, 2022; Florez-Jimenez *et al.*, 2024). Historically, the socioeconomic impacts of contagious diseases or pandemics have been known to affect stock markets (Chen *et al.*, 2007; Ichev *et al.*, 2018). After the COVID-19 pandemic outbreak and the consequent 'global meltdown,' scholars (Al-Awadhi *et al.*, 2020) started investigating the impact of COVID-19 and consequent government responses on stock market behaviors. Such as Xu (2021) investigated the impact of COVID-19-associated uncertainty on Canadian and the US stock markets and observed that COVID-19 induced uncertainty hurt the stock return in Canada more severely than in the US. Al-Awadhi *et al.* (2020) observed a negative impact of COVID-19 cases and deaths on the Chinese stock market. Narayan *et al.* (2020) indicated a positive impact of the government responses to COVID-19 on the stock market returns in the G7 economies. Ortmann *et al.* (2020) documented a significant change in investor behavior in response to the COVID-19 pandemic.

The second wave of empirical studies started investigating the impact of COVID-19 on firm behavior, as Shen *et al.* (2020) observed a negative impact of COVID-19 on the financial performance of Chinese firms. Using cross-country data, Hu *et al.* (2021) found that COVID-19 deteriorated firm performance, specifically in countries with poor health and financial systems. The duration and intensity variation of the pandemic and containment have different economic implications for different countries (Caggiano *et al.*, 2020; Maliszewska *et al.*, 2020). Due to the Zero-Covid policy of the Chinese government, the Chinese economy faced strict lockdowns[2] and their implications. Although, the impact of COVID-19 on the performance of Chinese firms has already been investigated. However, these studies used predicted values of firm performance (Shen *et al.*, 2020) or daily stock returns (Ren *et al.*, 2021) as a measure of firm performance. Second, none of these studies has explored the impact of COVID-19 on firm performance by adopting a strategic management perspective, i.e., addressing the COVID-19 threat by establishing an effective business strategy to signal corporate resilience.

To the best of the authors' knowledge, this is the first study that strategically investigates the impact of COVID-19 on firm performance. Using a longitudinal dataset of 2,606 firms listed from 2010 to 2022, we find that the COVID-19 pandemic adversely affects the performance of Chinese firms, favoring the *real options theory*. However, a timely deployed competitive business strategy enhances corporate resilience and mitigates the adverse effect of COVID-19 on firm performance, favoring *the dynamic capabilities view*. More specifically, an in-depth analysis reveals that the firms with a proactive business strategy showed better resilience during the COVID-19. Our results also reveal that the state-owned firms and larger firms showed better resilience during COVID-19 by formulating a competitive business strategy than non-state-owned and smaller firms. Finally, we ensure by using firm fixed effects, 2SLS, and propensity score matching (PSM) estimations that our results are not subject to endogeneity.

Our study contributes to the COVID-19, business strategy, and corporate resilience literature in manifolds. *First*, we extend the COVID-19 literature by pioneering the strategic investigation of the COVID-19 and firm performance nexus. *Second*, we contribute to the strategic management literature by documenting that a proactive business strategy enhances corporate resilience and mitigates the adverse impacts of pandemics such as COVID-19 on firm performance. *Third*, we extend the corporate governance and strategy literature by highlighting that the same business strategy may have different implications for firms depending on their ownership structure (i.e., state-owned or non-state-owned) and size (i.e., larger and smaller firms). These findings may help corporate managers better understand organizational needs and devise effective business strategies to enhance corporate resilience to cope with pandemics like COVID-19.

The rest of the paper is structured as follows: Section 2 develops hypotheses based on the relevant COVID-19, firm performance, business strategy, and corporate resilience literature. Section 3 presents the data and empirical framework. Sections 4 and 5 present and discuss the results, respectively. Finally, section 6 concludes the paper.

Literature review

The COVID-19 pandemic has been a severe health emergency globally, as more than 7 million people have died since its outbreak. More or less, all economies around the globe are affected by this pandemic. Due to the contagious nature of this disease, people were forced to adopt quarantine measures, go out less, and keep their distance from each other. The enforcement of these policy measures had a significant negative impact on aggregate consumption and demand for goods and services worldwide (Hu *et al.*, 2021; Shen *et al.*, 2020). On the one hand, the policy measures such as lockdowns and quarantines have been strictly enforced in China.

On the other hand, several countries imposed import restrictions on China as the origin of the COVID-19 outbreak. Consequently, the

1. https://data.who.int/dashboards/covid19/cases?n=c; accessed on October 17th, 2024.

2. https://www.reuters.com/world/china/what-is-chinas-zero-covid-policy-how-does-it-work-2022-11-03/

local and international demand for Chinese products decreased and China's gross domestic product (GDP) also dropped by 6.8% during the 1st quarter of 2020 (Shen *et al.*, 2020). Reduced demand resulted in fewer sales and the associated internal cash flows that are considered to be the bloodline for the firms. The corporations' investment, financing, and operational decisions are substantially linked to the cash flows. A decrease in cash flows may lead to a decrease in corporate investments and, consequently, corporate performance (Ren *et al.*, 2021; Shen *et al.*, 2020). The empirical evidence also shows that COVID-19 hit the financial markets severely, increasing stock returns volatility (Chowdhury *et al.*, 2022; Narayan *et al.*, 2020; Xu, 2021), decreasing liquidity (Just *et al.*, 2020), and increasing the cost of equity (Ke, 2022). Reduced and volatile internal cash flows, along with the increased cost of equity, weaken the operating/financial flexibility of the firms and, consequently, their performance (Feng *et al.*, 2022; Liu *et al.*, 2021). Based on these arguments and the significant COVID-19 literature, we develop our first hypothesis as under:

H1: *The performance of Chinese firms dropped during the COVID-19 crisis.*

A competitive business strategy in practice involves a broad range of strategic and tactical decisions, including product pricing and differentiation, investment in production and distribution facilities, contracting with customers and suppliers, spending on research and development, and building human capital (Shapiro, 1989). The *resource-based theory* (Wernerfelt, 1984) argues that a firm's competitive advantage is based on its access to internal resources (i.e., capital, human, R&D, and technology) and external operating environment. By effectively deploying its resources, a firm can devise a competitive business strategy and successfully align it with the external operating environment to bring resilience to the firm and enhance its performance (Kaplan *et al.*, 2008; Maury, 2022; Thaher *et al.*, 2022). Organizational learning over time enhances a firm's strategic capabilities, competitive business strategy, and, consequently, firm performance (Santos-Vijande *et al.*, 2012). For example, Chang *et al.* (2021) indicate that a strategic fit between customers and suppliers increases firm performance. Li *et al.* (2022) suggest that the strategically devised digital capabilities of Chinese firms enhance their performance. Maury (2022) concludes that strategically aligned CSR activities enhance the performance of firms operating in 23 developing countries. In particular, Maury (2022) shows that a proactive business strategy positively impacts firm performance. Cheema-Fox *et al.* (2021) argue that the firms signaling corporate resilience by adopting proactive strategies during COVID-19 such as limiting lay-offs, paying sick leaves, and providing flexible working schedules, experienced lesser negative returns.

The firms deploy a competitive business strategy by exploiting their resources to attain a competitive advantage. However, the question is how to sustain the competitive advantage (Rumelt *et al.*, 1994). The rapidly changing operating environment makes it difficult for firms to remain competitive by having control over scarce resources only (Wernerfelt, 1984). They need to consider managerial strategies to develop new capabilities. The *dynamic capabilities view* refers to the ability of firms to sustain competitive advantage by deploying their dynamic capabilities (Teece *et al.*, 1997). The term "dynamic" refers to the ability of firms to continually revive their competencies to align with a changing operating environment. This requires innovative responses, especially when precise timing is crucial, technological change is happening rapidly, and future competition and market conditions are hard to predict. The term "capabilities" underlines the important role of strategic management in successfully adapting, integrating, and reorganizing an organization's internal and external skills, resources, and functional competencies to align with the demands of a changing operating environment (Teece *et al.*, 1997).

Empirical evidence using resource-based and dynamic capabilities frameworks concludes that the integration of corporate capabilities enhances firms' resilience by making them more proactive, which significantly affects their performance (Iftikhar *et al.*, 2021; Makkonen *et al.*, 2014). Considering the *resource-based* and *dynamic capabilities* views and the related empirical evidence, we hypothesize that a business strategy devised according to the available resources and dynamic capabilities can attain as well as sustain corporate competitive advantage in a rapidly changing operating environment and consequently contribute to corporate resilience and enhance corporate performance (Ahsan *et al.*, 2022; Iftikhar *et al.*, 2021; Maury, 2022; Teece *et al.*, 1997; Wernerfelt, 1984). These arguments lead to our second hypothesis:

H2: *A competitive business strategy is a determinant factor in Chinese firm performance.*

COVID-19-associated policies (i.e., economic shutdowns, travel restrictions, and import bans, among others) created uncertainty about the financial outcomes and increased the information asymmetry between the firms and investors in the marketplace. According to the *real options theory*, corporate managers tend to defer their investments when facing uncertainty due to investment irreversibility (Ahsan *et al.*, 2022; Bernanke, 1983; Trigeorgis *et al.*, 2017). Most empirical studies investigating the impact of different types of uncertainties on firm behavior favor the *real options theory* and it has also been used in strategic management to address the fundamentals of a business strategy (Trigeorgis *et al.*, 2017). For example, Gulen *et al.* (2015) observed a significant negative impact of economic policy uncertainty on the investments of US-based firms. Montes *et al.* (2021) indicated that high political uncertainty weakens the confidence of Brazilian firms and reduces their investments. Mirza *et al.* (2020) observed that rising uncertainty increases corporate risk in China. However, holding back and exploring real options during uncertainties provide managers time to build appropriate strategies to enhance corporate resilience and to manage crises in a better way by devising an effective business strategy integrated with corporate resources (Porter, 1980; Trigeorgis *et al.*, 2017; Wang *et al.*, 2023).

Firms operate in a dynamic environment and if the corporate managers can successfully align their business strategy to their dynamic operating environment, it may enhance their capabilities to operate proactively and reduce the adverse effects of uncertainties (Ahsan *et al.*, 2022; Iftikhar *et al.*, 2021). When facing high uncertainty, corporate managers may adopt one of the two potential business strategies: One, corporate managers may follow a wait-and-see strategy and defer corporate investments until the conditions become more certain (i.e., a defensive business strategy). This strategy will reduce corporate investments; however, it will also decrease corporate risk (Mirza *et al.*, 2020) and provide managers time to transform based on their capabilities (Wang *et al.*, 2023). Recently, in the Chinese context, Ahsan *et al.* (2022) observed that a defensive business strategy can mitigate the adverse effects of economic policy uncertainty on corporate sustainable growth. On the other hand, uncertainty may also provide firms with new investment opportunities (Knight, 1921). Firms with dynamic capabilities may seize these investment opportunities during uncertain times as these firms can revive their competitive business strategy according to the changing operating environment. Dynamic capabilities allow firms to realize new opportunities through the timely conversion of organizational resources into a new competitive advantage (Makkonen *et al.*, 2014; Teece *et al.*, 1997). This proactive business strategy[3] will boost corporate investments but also increase corporate risk (Mirza *et al.*, 2020; Mirza *et al.*, 2024).

3. We use a scoring method to measure whether a firm is following a proactive or a defensive business strategy (a higher score indicates a proactive business strategy and vice versa), following prior related studies (Anwar *et al.*, 2016; Maury, 2022; Mirza *et al.*, 2020).

If successful, this proactive business strategy brings growth and enhances the firm's resilience. Further, proactive business strategies during crises may also enhance perceived corporate resilience and impact firm performance (Cheema-Fox *et al.*, 2021). Based on this reasoning, we argue that a competitive business strategy enhances corporate resilience under crises and propose our third hypothesis:

H3: *A competitive business strategy (proactive or defensive) weakens the adverse effects of COVID-19 on the performance of Chinese firms.*

Data and methodology

Data

We constructed a sample of Chinese companies listed on the Shanghai and Shenzhen stock exchanges between 2006[4] and 2022 from the China Stock Market and Accounting Research (CSMAR) database. CSMAR is one of the largest databases providing accounting data for Chinese-listed financial and non-financial firms (Ahsan *et al.*, 2022; Bin-Feng *et al.*, 2022; He *et al.*, 2020; Mirza *et al.*, 2020). Due to the differences in their accounting methods, we only consider non-financial enterprises and exclude those in the finance and insurance sectors. We also removed ST[5] (Special Treatment) and ST* class firms from our sample due to their abnormal financial conditions and firms with missing values for relevant data during the study period. After applying the filters above, we end with a dataset of 2,606 Chinese firms with a total of 19,677 firm-year observations.

Variables

This study investigates the impact of COVID-19 and business strategy on the performance of Chinese firms and the moderating effect that business strategy has on the relationship between COVID-19 and firm performance. Given that firm performance is our primary outcome variable, we measure it using Tobin's Q (*TBQ*) and market-to-book ratio (*MTB*) because these proxies of firm performance better incorporate the impact of COVID-19 induced information asymmetry as well as the impact of deferred investments due to increased uncertainty after the outbreak of COVID-19 (Ahsan *et al.*, 2021). Following prior studies (Ahsan *et al.*, 2021; Bhagat *et al.*, 2019; Wu *et al.*, 2020), Tobin's Q (*TBQ*) and market-to-book ratio (*MTB*) is measured as the market value of equity plus total liabilities scaled by total assets and market value of equity divided by the book value of equity, respectively. We operationalize our proxy of the COVID-19 pandemic using a dummy variable that takes the value of 1 for 2019 and 2020 and 0 otherwise. To measure business strategy (*STG*), we follow Bentley *et al.* (2013) and calculate five years moving averages of six indicators mentioned in Table 1. We then divide these averages into five quantiles and assign a value of 1 to the smallest quantile and 5 to the largest quantile. Next, we grouped these assigned quantile values for all the six indicators providing us with a maximum value of 30 and a minimum value of 6. A higher value represents a proactive business strategy, while a lower value represents a defensive business strategy (Ahsan *et al.*, 2022; Maury, 2022; Mirza *et al.*, 2020).

Further, we include board structure and firm characteristics in our models as they may impact firm performance and strategy (Ahsan *et al.*, 2022; Haque *et al.*, 2022; Ren *et al.*, 2021). We take board size (BDS), board independence (BDI), gender diversity (FBD), CEO-Chairman-duality (DUL), ownership concentration (OCN), firm size (FSZ), financial leverage (FLV), and cash flow ratio (CFR) as control variables following similar studies (Ahsan *et al.*, 2022; Bin-Feng *et al.*, 2022; Haque *et al.*, 2022; Ren *et al.*, 2021).

4 We use five years of moving average of the variables to measure corporate business strategy (STG), therefore, our final dataset used for regression analysis is for the period from 2010 to 2020.

5. Special Treatment Class companies are those companies, that are confronting financial troubles or other unusual difficulties in the Chinese stock market.

Empirical models

To investigate the impact of the COVID-19 pandemic on the performance of Chinese firms (H1), we develop the following econometric model:

$$FP_{it} = \alpha_0 + \alpha_1 CVD_i + \alpha_2 Cont_{it} + Ind_i + Yr_t + \varepsilon_{it} \qquad (1)$$

where FP_{it} represents one of the two proxies of firm performance (*TBQ/MTB*) of firm i at time t. CVD_i represents the COVID-19 period. Based on related literature (Ahsan *et al.*, 2022; Jabbouri *et al.*, 2020; Mirza *et al.*, 2020), $Cont_{it}$ represents several corporate governance and firm-level control variables. Corporate governance variables are board size (*BDS*), board independence (*BDI*), the ratio of female directors on board (*FBD*), CEO duality (*DUL*), ownership concentration (*OCN*), and firm-level variables are firm size (*FSZ*), financial leverage (*FLV*) and cash flow ratio (*CFR*). FP_{it} and Yr_t represent industry and year-fixed effects, respectively. ε_{it} represents standard errors. All variables are defined in Table 1.

TABLE 1
Definition of variables

Variable Name	Symbol	Definition
Tobin's Q ratio	TBQ	The market value of equity and total liabilities, all divided by total assets.
Market-to-book ratio	MTB	The market value of equity to book value of equity.
COVID-19	CVD	A dummy variable coded 1 for the years 2019 and 2020, and 0 otherwise.
Business strategy	STG	A cumulative score based on five years moving averages of six indicators: i. R&D Investment / Operating Income ii. Operating Income / Number of Employees iii. Operating Income Growth Rate) iv. (Sales Cost + Management Fee) / Operating Income) v. Rate of Employee Volatility vi. Net Fixed Assets / Total Assets The averaged indicators are grouped into five quantiles, assigning 1 for the smallest quantile and 5 for the largest. Then, grouping scores for the six indicators are summed to give a strategy score (BST), which ranges from 6 to 30. A higher score indicates an aggressive business strategy and vice versa.
Board size	BDS	Total number of directors on the board
Board independence	BDI	The ratio of independent directors to total directors on the board
Female directors' ratio	FBD	The ratio of female directors to total directors on the board
CEO duality	DUL	A dummy variable coded 1 if the chairman and the CEO are the same person, and 0 otherwise.
Ownership concentration	OCN	Shareholding percentage of the largest shareholder
Firm size	FSZ	Natural logarithm of total assets
Financial leverage	FLV	Total liabilities / Total assets
Cash flow ratio	CFR	Operating cash flows / Total liabilities

Note: Continuous variables were winsorized at the bottom 1% and top 99% levels.

Next, to investigate the impact of business strategy on the performance of Chinese firms (H2), we modify our baseline model as under:

$$FP_{it} = \alpha_0 + \alpha_1 STG_{it} + \alpha_2 Cont_{it} + Ind_i + Yr_t + \varepsilon_{it} \qquad (2)$$

where STG_{it} represents the business strategy score of firm i at time t and other variables are the same as explained in equation 1.

Finally, to investigate the moderating impact of business strategy on the relationship between the COVID-19 pandemic and firm performance, we extend our baseline model as under:

$$FP_{it} = \alpha_0 + \alpha_1 CVD_i + \alpha_2 STG_{it} + \alpha_3 CVD_i \ x \ STG_{it} + \alpha_4 Cont_{it} + Ind_i + Yr_t + \varepsilon_{it} \quad (3)$$

where STG_{it} represents the business strategy score of firm i at time t. $CVD_i \ x \ STG_{it}$ represents the interaction term of the COVID-19 pandemic with the business strategy score of firm i at time t. Other variables are the same as explained in Equation 1.

Empirical results

Summary statistics

Table 2 (Panel A) shows the summary statistics of all variables. The mean value of 2.127 for *TBQ* and 2.132 for *MTB* indicate that, on average, the market value of sample firms is higher than their book value. On average, 19.5% (mean CVD=0.195) of the firm-year observations are from the COVID-19 pandemic period. The mean and standard deviation values for the business strategy score (*STG*) are 18.027 and 4.542, indicating that sample firms follow different business strategies (proactive or defensive). These statistics are comparable with a recent study in the Chinese context (Mirza *et al.*, 2020).

Turning to control variables, the mean (8.580), minimum (3.000), and maximum (18.000) values of board size (*BDS*) indicate that some of the sample firms have very large boards while others have quite small boards (Wu *et al.*, 2020). The mean value of 0.375 for *BDI* and 0.191 for *FBD* indicate that, on average, 37.50 percent of the board members are independent (Khan *et al.*, 2021; Wu *et al.*, 2020), and 19.10 percent are women. The mean value of 0.696 for *DUL* explains that 69.6 percent of the sample firms have the same person serving as CEO as well as the chairman of the board. The mean value of 0.323 for *OCN* indicates that, on average, the largest shareholder owns 32.30 percent equity (Feng *et al.*, 2022). The mean and median differences for firm size (*FSZ*) are small, i.e., 22.296 and 22.143, respectively, and the standard deviation is 1.248, indicating that, on average, there is no significant difference in the size of sample firms (Feng *et al.*, 2022; Khan *et al.*, 2021). The mean and median for asset-liability ratio (*FLV*) are 0.449 and 0.446, indicating that almost half of the sample firms have average financial leverage (Khan *et al.*, 2021). The mean value of 0.084 for *CFR* indicates that, on average, the operating cash flows of the sample firms are 8.40 percent of their total liabilities.

TABLE 2

Panel A: Summary statistics

Variables	N	Mean	Standard. deviation	Median	Minimum	Maximum
TBQ	19,677	2.127	1.415	1.674	0.866	10.839
MTB	19,677	2.132	1.385	1.694	0.867	10.225
CVD	19,677	0.195	0.396	0.000	0.000	1.000
STG	19,677	18.027	4.542	18.000	6.000	30.000
BDS	19,677	8.580	1.714	9.000	3.000	18.000
BDI	19,677	0.375	0.055	0.357	0.154	0.750
FBD	19,677	0.191	0.114	0.174	0.000	0.875
DUL	19,677	0.696	0.460	1.000	0.000	1.000
OCN	19,677	0.323	0.145	0.300	0.021	0.900
FSZ	19,677	22.296	1.248	22.143	19.402	27.093
FLV	19,677	0.449	0.205	0.446	0.053	0.988
CFR	19,677	0.084	0.219	0.047	-0.540	1.709

Panel B: Mean difference in firm performance during COVID-19 and normal period

Variables	Mean COVID-19	Mean normal	t-statistic	p-value
TBQ	1.860	2.191	13.026***	0.000
MTB	1.860	2.197	13.566***	0.000

Note: *** p<0.01. All variables are explained in Table 1.

Panel B (Table 2) presents the results of the mean comparison t-test carried out to investigate the differences in the firm performance during COVID-19 and normal times. The mean values during COVID-19 (*TBQ*=1.860, *MTB*=1.860) and during normal times (*TBQ*=2.191, *MTB*=2.197) indicate a lower performance for the firms during the COVID-19 pandemic.

Correlation analysis

Table 3 presents the results of pairwise correlations among the variables. It shows that *TBQ (-0.092*)* and *MTB (-0.096*)* are negatively and significantly correlated with *CVD*, indicating that regardless of other conditions, the firms during COVID-19 experienced a lower market performance, which supports our first hypothesis. Further, we observe a significant positive correlation of *STG* with *TBQ (0.102*)* and *MTB (0.098*)*, indicating that business strategy is positively related to the market performance of Chinese firms, favoring the study's second hypothesis.

TABLE 3

Pairwise correlations

Variables	TBQ	MTB	CVD	STG	BDS	BDI	FBD	DUL	OCN	FSZ	FLV	CFR	VIF
TBQ	1.000												
MTB	0.983*	1.000											
CVD	-0.092*	-0.096*	1.000										1.06
STG	0.102*	0.098*	0.012	1.000									1.05
BDS	-0.134*	-0.134*	-0.077*	-0.053*	1.000								1.53
BDI	0.049*	0.050*	0.025*	0.016*	-0.516*	1.000							1.40
FBD	0.088*	0.091*	0.048*	0.069*	-0.184*	0.088*	1.000						1.09
DUL	-0.043*	-0.048*	0.054*	-0.096*	0.198*	-0.086*	-0.141*	1.000					1.08
OCN	-0.106*	-0.109*	-0.063*	-0.064*	0.058*	0.009	-0.104*	0.092*	1.000				1.10
FSZ	-0.447*	-0.451*	0.107*	0.004	0.233*	-0.018*	-0.169*	0.073*	0.200*	1.000			1.45
FLV	-0.277*	-0.293*	-0.022*	-0.095*	0.134*	-0.023*	-0.136*	0.083*	0.086*	0.447*	1.000		1.42
CFR	0.111*	0.125*	-0.025*	-0.012	0.024*	-0.005	0.059*	-0.077*	0.072*	-0.060*	-0.345*	1.000	1.12

Note: * p<0.05. All variables are explained in Table 1.

Main results

Table 4 (Columns 1 and 4) presents the results of time and industry fixed effects regression analysis investigating the impact of COVID-19 (*CVD*) on the performance of Chinese non-financial firms (*TBQ* & *MTB*). We consistently observe a significantly negative relationship between the COVID-19 pandemic (*CVD*) and the performance of Chinese firms measured by Tobin's Q (*TBQ*) and market-to-book ratio (*MTB*), indicating that COVID-19-induced uncertainty has adverse effects on the performance of Chinese firms. Aligned with the *real options theory*, these results validate H_1 and highlight that COVID-19 pandemic-induced uncertainty forced Chinese firms to defer their investments, consequently deteriorating their performance. These findings favor the results of earlier studies indicating the adverse impact of COVID-19 on firm performance, corporate investments, and stock returns (Caggiano *et al.*, 2020; Ren *et al.*, 2021; Shen *et al.*, 2020).

Table 4 (Columns 2 and 5) presents the results of time and industry fixed effects regression analysis investigating the impact of business strategy (*STG*) on the market performance of Chinese non-financial firms (*TBQ* & *MTB*). We observe a significantly positive relationship between business strategy score (*STG*) with both measures of firm performance (*TBQ* & *MTB*), suggesting that the higher the score of business strategy, the higher the firm performance. In line with the *resource-based theory* and *dynamic capabilities view*, these results support H2 and indicate that effective use of resources through dynamic capabilities helps firms in devising a competitive business strategy, which significantly enhances firm performance.

Finally, we examine whether business strategy (*STG*) moderates the negative impact of COVID-19 (*CVD*) induced uncertainty on firm performance (*TBQ* & *MTB*). Table 4 (Columns 3 and 6) presents the results of time and industry fixed effects regression analysis investigating the moderating impact of business strategy (*STG*) on the relationship between COVID-19 and the performance of Chinese firms (*TBQ* & *MTB*). We observe a significant positive moderating impact of business strategy score (*STG*) on both measures of firm performance (*TBQ* & *MTB*), suggesting that a proactive business strategy enhances corporate resilience and mitigates the adverse effects of COVID-19 induced uncertainty on the performance of Chinese firms. Hence, validating H3 of the study. These findings favor the *dynamic capabilities view* and indicate that although uncertainty in the marketplace creates ambiguity and increases information asymmetry, it simultaneously provides investment opportunities. When facing uncertainty, the firms without dynamic capabilities may defer their investments, which provides an opportunity for the firms with dynamic capabilities to proactively revive their competitive strategy according to the changing environment and to seize these investment opportunities and contribute to the firm performance even during uncertain times (Ahsan *et al.*, 2021), such as the COVID-19 pandemic.

Concerning corporate governance variables, we observe a significant positive association of board size (*BDS*), board independence (*BDI*), and female directors (*FBD*) with both proxies of firm performance (*TBQ* & *MTB*), indicating that large, independent, and gender-diverse boards, positively contribute to the performance of sample Chinese firms. Contrarily, we observe a significant negative association of CEO duality (*DUL*) and ownership concentration (*OCN*) with *TBQ* (models 1-3) as well as *MTB* (models 1-3), indicating that CEO duality and concentrated ownership hurt the performance of Chinese firms. Further, we observe a highly significant negative association of firm size (*FSZ*) and leverage (*FLV*) with performance (*TBQ* & *MTB*), indicating a lower performance for large and highly leveraged Chinese firms (Ahsan *et al.*, 2022). However, we observe a highly significant positive association of cash flow ratio (*CFR*) with firm performance (*TBQ* & *MTB*), indicating that a higher cash flow to liabilities ratio positively contributes to the performance of Chinese firms.

TABLE 4

The impact of COVID-19 and business strategy on firm performance.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	TBQ	TBQ	TBQ	MTB	MTB	MTB
CVD	-0.384***		-0.565***	-0.421***		-0.629***
	(0.050)		(0.074)	(0.049)		(0.072)
STG		0.025***	0.022***		0.022***	0.019***
		(0.002)	(0.002)		(0.002)	(0.002)
CVD X STG			0.016***			0.018***
			(0.005)			(0.004)
BDS	0.019***	0.020***	0.021***	0.019***	0.021***	0.021***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
BDI	1.098***	1.114***	1.124***	1.103***	1.117***	1.128***
	(0.176)	(0.175)	(0.175)	(0.171)	(0.170)	(0.170)
FBD	0.228***	0.202**	0.200**	0.227***	0.203***	0.201***
	(0.080)	(0.080)	(0.080)	(0.078)	(0.077)	(0.077)
DUL	-0.082***	-0.064***	-0.062***	-0.079***	-0.063***	-0.060***
	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.019)
OCN	-0.164***	-0.140**	-0.136**	-0.180***	-0.159***	-0.154***
	(0.062)	(0.062)	(0.062)	(0.060)	(0.060)	(0.060)
FSZ	-0.461***	-0.472***	-0.472***	-0.446***	-0.455***	-0.456***
	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)
FLV	-0.117**	-0.062	-0.064	-0.211***	-0.162***	-0.165***
	(0.053)	(0.053)	(0.053)	(0.051)	(0.051)	(0.051)
CFR	0.664***	0.689***	0.686***	0.694***	0.715***	0.712***
	(0.044)	(0.044)	(0.044)	(0.043)	(0.042)	(0.042)
Constant	12.526***	12.373***	12.409***	12.257***	12.122***	12.162***
	(0.215)	(0.215)	(0.215)	(0.209)	(0.209)	(0.209)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,677	19,677	19,677	19,677	19,677	19,677
R-squared	0.326	0.332	0.332	0.337	0.341	0.342

Note: This table presents the results of regression analysis investigating the impact of COVID-19, business strategy, and the moderating impact of business strategy on the relationship between COVID-19 and the performance of Chinese firms. Standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All variables are explained in Table 1.

Channel Analysis

The state ownership of Chinese firms is widespread. More than 40% of Chinese firms are owned and controlled by the local or central government (Farooq *et al.*, 2022). Furthermore, state-owned firms are characterized by weak internal corporate governance mechanisms and serious agency problems due to the separation of ownership and control (Jiang *et al.*, 2020). Following Jiang *et al.* (2020), we expect the impact of COVID-19-induced uncertainty to be more pronounced on the performance of Chinese state-owned than non-state-owned firms. If that is the case, the business strategy is also more likely to moderate the negative impact of the COVID-19 pandemic on the performance of state-owned firms.

Table 5 presents the results of time and industry fixed effects regression analysis investigating the moderating impact of business strategy (*STG*) on the performance of Chinese state-owned (SOFs) and non-state-owned (non-SOFs) firms. We first observe a significantly negative (positive) impact of the COVID-19 pandemic (business strategy) on both proxies of firm performance (*TBQ* & *MTB*), suggesting that the COVID-19 pandemic reduces while business strategy increases the performance of the Chinese state-owned as well as non-state-owned firms. Concerning the moderation of business

TABLE 5

Results using the subsample of state-owned and non-state-owned firms.

Variables	State-owned firms		Non-state-owned firms	
	(1)	(2)	(3)	(4)
	TBQ	MTB	TBQ	MTB
CVD	-0.548***	-0.604***	-0.823***	-0.851***
	(0.081)	(0.080)	(0.150)	(0.145)
STG	0.025***	0.023***	0.029***	0.027***
	(0.003)	(0.003)	(0.004)	(0.004)
CVD x STG	0.020***	0.022***	0.013	0.012
	(0.005)	(0.005)	(0.009)	(0.009)
BDS	0.016**	0.018***	0.033***	0.030**
	(0.007)	(0.007)	(0.012)	(0.012)
BDI	0.688***	0.702***	1.094***	1.015***
	(0.205)	(0.203)	(0.338)	(0.326)
FBD	0.353***	0.365***	0.124	0.122
	(0.108)	(0.107)	(0.134)	(0.129)
DUL	-0.012	-0.004	-0.092***	-0.094***
	(0.029)	(0.028)	(0.031)	(0.030)
OCN	-0.043	-0.063	0.053	0.038
	(0.076)	(0.076)	(0.114)	(0.110)
FSZ	-0.343***	-0.334***	-0.661***	-0.642***
	(0.011)	(0.010)	(0.017)	(0.016)
FLV	-0.514***	-0.579***	0.253***	0.191**
	(0.067)	(0.066)	(0.095)	(0.092)
CFR	0.602***	0.656***	0.741***	0.757***
	(0.059)	(0.058)	(0.077)	(0.075)
Constant	9.732***	9.591***	16.303***	16.035***
	(0.250)	(0.247)	(0.431)	(0.417)
Time-fixed effects	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes
Observations	9,091	9,091	7,445	7,445
R-squared	0.351	0.358	0.397	0.404

Note: This table presents the results of regression analysis investigating the impact of COVID-19, business strategy, and the moderating impact of business strategy on the relationship between COVID-19 and firm performance in China for the state-owned and non-state-owned firms. Standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All variables are explained in Table 1.

TABLE 6

Results using the subsample of small and large firms

Variables	Small firms		Large firms	
	(1)	(2)	(3)	(4)
	TBQ	MTB	TBQ	MTB
CVD	-0.488***	-0.558***	-0.467***	-0.522***
	(0.119)	(0.115)	(0.073)	(0.073)
STG	0.029***	0.024***	0.027***	0.025***
	(0.003)	(0.003)	(0.002)	(0.002)
CVD x STG	0.011	0.014*	0.021***	0.022***
	(0.008)	(0.007)	(0.004)	(0.004)
BDS	0.017	0.019*	0.007	0.007
	(0.011)	(0.010)	(0.005)	(0.005)
BDI	0.758***	0.734***	0.414**	0.458***
	(0.292)	(0.280)	(0.164)	(0.164)
FBD	0.251**	0.240**	0.104	0.120
	(0.115)	(0.111)	(0.084)	(0.084)
DUL	-0.019	-0.019	0.014	0.012
	(0.028)	(0.027)	(0.021)	(0.021)
OCN	-0.473***	-0.452***	0.160***	0.105*
	(0.102)	(0.098)	(0.057)	(0.057)
FSZ	-1.349***	-1.310***	-0.121***	-0.114***
	(0.023)	(0.022)	(0.011)	(0.011)
FLV	0.313***	0.176**	-0.627***	-0.689***
	(0.075)	(0.072)	(0.059)	(0.059)
CFR	0.342***	0.369***	1.395***	1.417***
	(0.056)	(0.054)	(0.057)	(0.057)
Constant	30.930***	30.271***	4.477***	4.410***
	(0.516)	(0.495)	(0.267)	(0.267)
Time-fixed effects	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes
Observations	9,924	9,924	9,752	9,752
R-squared	0.410	0.419	0.322	0.330

Note: This table presents the results of regression analysis investigating the impact of COVID-19, business strategy, and the moderating impact of business strategy on the relationship between COVID-19 and firm performance in China for small and large firms. Standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All variables are explained in Table 1.

strategy, we observe a highly positive and significant relationship of the interaction term (*CVD x STG*) with both proxies of performance (*TBQ* & *MTB*) only for the sample of state-owned firms. These findings suggest that a proactive business strategy mitigates the adverse effects of COVID-19 on the performance of Chinese state-owned firms only, which is aligned with our main argument that because of their weak governance mechanism and severe agency issues, state-owned firms are likely to be more exposed to the threat of COVID-19; therefore, business strategy is more relevant for such firms than rest of the Chinese firms.

Financial flexibility may affect the financial performance and investment strategy of the firms (Ma *et al.*, 2016). It is considered one of the key determinants of corporate investment/financing strategy because it provides firms with the opportunity to enhance firm performance by deploying resources and making investments, specifically during uncertain times (Arslan-Ayaydin *et al.*, 2014; Feng *et al.*, 2022). Empirical evidence shows that financial flexibility has been an important determinant of the performance and investment of East Asian firms during the Asian 1997-1998 crisis (Arslan-Ayaydin *et al.*, 2014). Financial flexibility may also determine the business strategy (proactive vs. defensive) of the firms, as a proactive business strategy means seizing investment opportunities even during uncertain times. Firm size can be used as a proxy for financial flexibility or financial constraints as smaller (bigger) firms may have lesser (higher) internal funds and may have higher (lower) dependence on external sources of finance as compared to the bigger firms (Gertler *et al.*, 1994). If that is the case, bigger firms may implement a proactive business strategy in a better way as compared to the smaller firms.

Table 6 presents the results of time and industry fixed effects regression analysis investigating the moderating impact of business strategy (*STG*) on the performance of smaller[6] and larger Chinese firms. We first observe a significantly negative (positive) impact of the COVID-19 pandemic (business strategy) on both proxies of firm performance (*TBQ* & *MTB*), suggesting that the COVID-19 pandemic reduces while business strategy increases the performance of the Chinese small as well as large firms. Concerning the moderation of business strategy, we observe a highly positive and significant relationship of the interaction term (*CVD x STG*) with both proxies of performance (*TBQ* & *MTB*) only for the sample of large firms. These findings suggest that business strategy mitigates the adverse effects of COVID-19 on the performance of large Chinese firms only, which is aligned with our main argument. Larger firms with higher financial flexibility and lesser financing constraints have a higher ability to deploy funds to seize investment opportunities by following a proactive business strategy during uncertain times, which consequently enhances their performance.

6. We classify sample datset into small and large firms by making two quantiles based on the mean value of the firm's total assets.

Robustness – Alternate proxies of business strategy

A business strategy can be classified as proactive or defensive based on the company's business strategy score. Therefore, it would be interesting to examine whether both strategies help reduce the negative impact of COVID-19 on firm performance. To perform this analysis, we operationalize our measures of proactive and defensive strategy as suggested by Ahsan *et al.* (2022). We use the overall business strategy score (*STG*), which ranges between 6 and 30, to operationalize the proactive and defensive strategy measures. Proactive business strategy (*PRO_STG*) is a dummy variable that takes the value of 1 if the business strategy score is higher than 24 and 0 otherwise. Defensive business strategy (*DEF_STG*) is another dummy variable that takes the value of 1 if the business strategy score is lower than 12 and 0 otherwise.

Table 7 presents the time and industry fixed effects regression analysis results investigating the moderating impact of business strategy using alternate proxies. We observe a significant positive moderating impact of the interaction term of COVID-19 with proactive business strategy (*CVD x PRO_STG*) and a significant negative impact of the interaction term of COVID-19 with the defensive business strategy (*CVD x DEF_STG*) on the performance sample Chinese firms, consistent with the main results of the study. In other words, the higher the business strategy score, the higher the mitigating effect on the relationship between the COVID-19 pandemic and firm performance. These findings are very interesting as they contradict the results of an earlier study that suggested a positive moderating role of a defensive business strategy to mitigate the negative impact of policy-induced uncertainty on the sustainable financial growth of Chinese firms (Ahsan *et al.*, 2022). Comparing the results of our study with Ahsan *et al.* (2022), we may suggest that a defensive business strategy may mitigate the negative impact of policy-induced uncertainty; however, it may not mitigate the adverse effects of COVID-19 induced uncertainty on the performance of Chinese firms. To mitigate the adverse effects of COVID-19, the firms had to be proactive to seize the opportunities deferred by their competitors.

Controlling for unobserved heterogeneity and endogeneity issues

Our results may be subject to unobserved heterogeneity and endogeneity issues. Unobserved heterogeneity refers to the possibility that the increase in market performance might be due to some firm-specific factors that are not controlled in the model rather than business strategy. Therefore, to control for the possible impact of unobserved heterogeneity, we apply the firm-fixed effects regression technique (Baltagi, 2008) and observe a significant negative impact of COVID-19 (*CVD*) and a significant positive moderating impact of the business strategy (*CVD x STG*) on the performance (*TBQ* & *MTB*) of sample firms (Table 8 (Panel-A), Columns 1 and 2). Hence confirming that our main findings are not subject to unobserved heterogeneity.

Further, to control for possible endogeneity concerns due to the bidirectional relationships between firm performance and business strategy, we apply 2SLS as high-performing firms may have a higher tendency to follow a proactive business strategy and vice versa. In Table 8 (Panel-A - Columns 3 and 4), we present the second-stage results of the 2SLS regression analysis[7], taking the one-year lag and industry average of the business strategy score as instrumental variables (Krolikowski *et al.*, 2017; Shahab *et al.*, 2022; Zhang *et al.*, 2020). We consistently observe a positively significant direct impact of business strategy (*STG*) and a significantly positive moderating impact of the business strategy on the performance (*TBQ* & *MTB*) of Chinese firms. The results of the Sargan test indicate that our model does not suffer from endogeneity issues due to reverse causality between market performance and business strategy of the Chinese firms.

Self-selection bias refers to the possibility that the increase or decrease in firm performance may be due to firm-specific control variables rather than COVID-19 or business strategy (Gull *et al.*, 2023). We, therefore, apply propensity score matching (PSM) to ensure our findings are not driven by self-selection bias, in line with recent literature (Gull *et al.*, 2023; Nadeem *et al.*, 2020). Table 8 (Panel-A -Columns 5 and 6) presents the results of the PSM analysis. To apply PSM, we classify firm-year observations into two categories, i.e., those with a business strategy score (STG) higher than the sample median (treatment group) and those with a business strategy score (STG) lower than the sample median (control group). Then, we re-estimate equation 1 by applying probit regression. Next, we estimate the predicted values from the re-estimation of equation 1, and these predicted values represent propensity scores for

TABLE 7

Results using alternate proxies of business strategy

Variables	(1) TBQ	(2) TBQ	(3) MTB	(4) MTB
CVD	-0.405***	-0.348***	-0.448***	-0.384***
	(0.051)	(0.052)	(0.050)	(0.050)
PRO	0.190***		0.144***	
	(0.025)		(0.024)	
CVD x PRO_STG	0.157***		0.184***	
	(0.054)		(0.053)	
DEF		-0.126***		-0.116***
		(0.023)		(0.022)
CVD x DEF_STG		-0.108**		-0.118**
		(0.049)		(0.048)
BDS	0.020***	0.019***	0.020***	0.020***
	(0.006)	(0.006)	(0.006)	(0.006)
BDI	1.105***	1.116***	1.110***	1.120***
	(0.176)	(0.176)	(0.171)	(0.171)
FBD	0.221***	0.209***	0.220***	0.208***
	(0.080)	(0.080)	(0.078)	(0.078)
DUL	-0.069***	-0.077***	-0.067***	-0.073***
	(0.020)	(0.020)	(0.019)	(0.019)
OCN	-0.154**	-0.152**	-0.170***	-0.169***
	(0.062)	(0.062)	(0.060)	(0.060)
FSZ	-0.468***	-0.465***	-0.452***	-0.449***
	(0.009)	(0.009)	(0.008)	(0.008)
FLV	-0.085	-0.103*	-0.184***	-0.198***
	(0.053)	(0.053)	(0.051)	(0.051)
CFR	0.679***	0.669***	0.705***	0.698***
	(0.044)	(0.044)	(0.042)	(0.042)
Constant	12.621***	12.581***	12.337***	12.308***
	(0.215)	(0.215)	(0.209)	(0.209)
Time-fixed effects	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes
Observations	19,677	19,677	19,677	19,677
R-squared	0.330	0.328	0.339	0.338

Note: This table presents the results of regression analysis investigating the impact of COVID-19, business strategy, and the moderating impact of business strategy on the relationship between COVID-19 and the performance of Chinese firms, using alternate proxies of business strategy, namely, proactive (*PRO*) and defensive (*DEF*) business strategy. Standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All variables are explained in Table 1.

7. The results of first stage estimations are not reported for the sake of brevity but available from corresponding author on request.

TABLE 8

Panel-A : Addressing endogeneity

Variables	Firm fixed effects		2SLS		PSM	
			2nd Stage		Post matched sample	
	(1)	(2)	(3)	(4)	(5)	(6)
	TBQ	MTB	TBQ	MTB	TBQ	MTB
CVD	-0.427***	-0.502***	-0.370***	-0.404***	-0.592***	-0.665***
	(0.063)	(0.062)	(0.074)	(0.071)	(0.085)	(0.082)
STG	-0.003	-0.009***	0.030***	0.024***	0.024***	0.020***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
CVD x STG	0.017***	0.019***	0.013***	0.016***	0.018***	0.020***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
BDS	0.017**	0.019**	0.181***	0.195***	0.022***	0.023***
	(0.008)	(0.007)	(0.061)	(0.058)	(0.007)	(0.007)
BDI	0.870***	0.926***	1.026***	1.044***	1.184***	1.214***
	(0.203)	(0.197)	(0.204)	(0.197)	(0.195)	(0.190)
FBD	0.261***	0.254***	0.252***	0.249***	0.204**	0.195**
	(0.096)	(0.093)	(0.095)	(0.092)	(0.088)	(0.085)
DUL	-0.039*	-0.034	-0.039	-0.046**	-0.064***	-0.061***
	(0.022)	(0.021)	(0.024)	(0.023)	(0.022)	(0.021)
OCN	-0.457***	-0.495***	0.179**	0.118*	-0.103	-0.124*
	(0.085)	(0.082)	(0.071)	(0.069)	(0.068)	(0.066)
FSZ	-0.532***	-0.515***	-0.543***	-0.519***	-0.454***	-0.436***
	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.009)
FLV	-0.022	-0.098	-0.041	-0.142**	-0.170***	-0.271***
	(0.062)	(0.060)	(0.061)	(0.059)	(0.060)	(0.059)
CFR	0.618***	0.607***	0.873***	0.870***	0.668***	0.697***
	(0.044)	(0.043)	(0.062)	(0.059)	(0.048)	(0.047)
Constant	13.789***	13.543***	13.454***	13.033***	12.014***	11.742***
	(0.246)	(0.239)	(0.271)	(0.261)	(0.243)	(0.235)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	No	No	Yes	Yes	Yes	Yes
Firm-fixed effects	Yes	Yes	No	No	No	No
Observations	19,677	19,677	19,677	19,677	16,454	16,454
R-squared	0.270	0.279	0.390	0.399	0.321	0.331
Sargan			26.405	0.047		
Sargan *p-value*			0.160	0.828		

Panel-B : Pre- and post-matched sample mean

Variable	Mean - Treatment group	Mean - Control group	P>t
BDS	8.557	8.540	0.524
BDI	0.375	0.376	0.764
FBD	0.193	0.195	0.267
DUL	0.690	0.677	0.061
OCN	0.320	0.320	0.985
FSZ	22.295	22.283	0.569
FLV	0.440	0.436	0.187
CFR	0.087	0.088	0.859

Note: This table presents the results of regression analysis investigating the impact of COVID-19, business strategy, and the moderating impact of business strategy on the relationship between COVID-19 and the performance of Chinese firms, using firm fixed-effects, two-stage least square (2SLS), propensity score matching (PSM) regressions. For 2SLS, we use the industry average of the business strategy score (STG) and the one-year lag of the business strategy score (STG) as instrumental variables in 2SLS regression. For PSM, we define firm-years as belonging to the treatment group when their level of business strategy score is higher than the sample median, while the control group includes firm-years whose level of business strategy score is lower than the sample median. Standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All variables are explained in Table 1.

each firm-year observation. Based on these propensity scores, we create two similar subsamples representing the treatment and control groups. Finally, we apply regression on the post matched sample (Columns 5 and 6) and observe consistent results. Panel B (Table 8) presents the mean difference test for treatment and control groups, indicating no significant differences between the mean values of control variables for the two groups (i.e., treatment and control group).

Discussion

The study underlines the unprecedented economic impacts of the COVID-19 pandemic, which has caused enormous distress and disruption across the globe, challenging the resilience of societies, organizations, and financial systems. Resilience, defined as the ability to withstand disruptions (Bhamra *et al.*, 2011; Van Der Vegt *et al.*, 2015), emerges as a critical factor in determining the survival of organizations and financial systems, particularly during pandemics. The contribution of the study lies in its strategic investigation into the nexus between COVID-19 and firm performance, offering insights into how corporate resilience can navigate the challenges posed by the pandemic. The findings indicate that firms employing proactive business strategies exhibit better resilience during the pandemic, aligning with the *dynamic capabilities view*. These findings imply that firms with dynamic capabilities effectively integrate their resources to attain and sustain competitive advantage, which consequently enhances their resilience and ability to be more proactive in seizing the opportunities left by their competitors (Ahsan *et al.*, 2021). These results favor the findings of Iftikhar *et al.* (2021), indicating that integration of supply chain capabilities develops corporate resilience and makes firms more dynamic. These results also favor the findings of Cheema-Fox *et al.* (2021), who argue that the firms signaling better corporate resilience through proactive business strategies experienced lesser negative returns.

Moreover, the study reveals that the effectiveness of these strategies varies depending on factors such as ownership structure and firm size, shedding light on nuanced implications for different types of firms. Specifically, a proactive business strategy mitigates the negative impact of COVID-19 for the state-owned and larger firms only. The state-owned and larger firms have financial flexibility due to their better access to resources (Bin-Feng *et al.*, 2022; Gertler *et al.*, 1994). Financial flexibility improves corporate resilience and the ability of the firms to be more proactive (Khan *et al.*, 2021); therefore, the state-owned and larger firms had a higher ability to deploy a proactive business strategy when experiencing COVID-19-related challenges.

Conclusion

The recent COVID-19 pandemic has put thousands of companies around the world in front of unprecedented challenges and facing tremendous difficulties. However, firms have faced these difficulties differently depending on the extent to which they were resilient to this event. The capacity of firms to develop strategies to signal or enhance corporate resilience was a key solution for many firms during this turmoil period to curb the adverse effects of the pandemic and limit the impacts of the threats. This paper studies the effects of the COVID-19 pandemic and business strategy on the financial performance of Chinese-listed firms. In particular, it analyzes the moderating role that business strategy plays in shaping the impact of COVID-19 on firm performance. In other words, it assesses whether business strategies help firms become more resilient in the case of extreme health events such as that of the COVID-19 pandemic.

The paper uses a large sample of 2,606 Chinese non-financial listed firms covered over the period from 2010 to 2022. It shows evidence that the COVID-19 pandemic has detrimentally affected firms' performance, whereas business strategy has increased firms' resilience during these difficult periods. In particular, the empirical results show that business strategy positively moderates the detrimental effects of COVID-19 on firm performance. Additional analyses show that the effect of business strategy is more exacerbated in firms that have adopted a proactive rather than defensive business strategy during the COVID-19 pandemic. We also find that these relationships are more pronounced for state-owned and large firms than non-state-owned and small firms. Our results are robust to a battery of robustness tests and contribute to the growing debate on the role of business strategy during crises.

By extending the literature on COVID-19, business strategy, and corporate resilience, this study offers valuable insights for corporate managers and policymakers alike. It underscores the importance of adapting strategic approaches to mitigate the adverse impacts of pandemics on firm performance. Furthermore, it highlights the need for a nuanced understanding of organizational needs, emphasizing the role of effective business strategies in enhancing resilience to cope with crises like COVID-19.

In summary, this study contributes to a deeper understanding of the complex dynamics between pandemics and firm performance, offering actionable insights to inform decision-making in the face of unprecedented challenges. Moving forward, further research in this area will be crucial for developing strategies to build resilience and mitigate the impacts of future crises on economies and societies worldwide.

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