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Organizational capital and stock performance during Crises: Moderating role of generalist CEO

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ABSTRACT

This study examines the relationship between organizational capital (OC) and stock performance during the two recent crisis periods, namely the GFC and COVID-19. Economic crises highlight the sustainable competitiveness of firms, providing an opportunity to identify the role of OC. OC is intangible capital that encompasses intrinsic business processes and expertise, facilitating more efficient resource utilization than competitors. Results show that a greater OC is significantly associated with higher stock returns during both crisis periods. The association is robust to the models with firm-fixed effects and instrumental variables. In addition, we find evidence that generalist CEOs strengthen this relationship while specialist CEOs do not. This study emphasizes the pivotal role of OC as a protective buffer against external shocks, particularly during periods when the market pays more attention to corporate sustainability.

1. Introduction

Organizational capital (OC) is a crucial intangible production factor inherent in firms, impacting their unique productivity and operating efficiency. This intangible capital encompasses intrinsic business processes and expertise, facilitating more efficient resource utilization than competitors (Eisfeldt & Papanikolaou, 2013). OC is empirically estimated as a firm's cumulative selling, general, and administrative expenses (SG&A) (Lev & Radhakrishnan, 2005). It has been linked to enhanced productivity, innovation performance, and overall corporate sustainability (Hasan et al., 2021; Li et al., 2018). Existing empirical studies have identified OC as a significant contributor to stock returns in non-crisis periods (Leung et al., 2018; Lev et al., 2009). However, its impact on crisis period returns remains unexplored. In this study, we investigate OC's role in sustainable competitive advantage by analyzing crisis period returns during the two recent crises: the Global Financial Crisis (GFC) and COVID-19.

Previous literature has used economic crises as unique experimental settings to examine a firm's sustainable competitiveness (Bose et al., 2022; Lome et al., 2016). Most firms experience a meltdown in firm values during crises due to expected underperformance and increased risk. If an economically meaningful factor alleviates the market's concern about performance or risk, its association with crisis period returns would be statistically significant. We argue that OC plays a key role in maintaining operating performance as it is associated with more efficient resource utilization than competitors. During crisis periods, not only financial resources but also other essential resources for operations may be limited, increasing the importance of efficient resource management. Therefore, we

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hypothesize that greater OC is associated with a smaller drop in stock returns and a lower decline in operating performance.

The increasing focus on intangible capital in corporate sustainability is becoming more evident in finance research. Notable research includes the integration of Environmental, Social, and Governance (ESG) practices into business strategies (Clark et al., 2015), the identification of social capital as a key driver in enhancing corporate performance and innovation (Lins et al., 2017; Liu et al., 2021), and the acknowledgment of intellectual capabilities as essential for navigating dynamic and disruptive business environments (Buallay et al., 2019; Cohen & Kaimenakis, 2007). We claim that a deeper understanding of OC's role, especially during economic crises, would provide insights into how intangible capital supports corporate sustainability. This knowledge is vital for stakeholders, including corporate managers and investors, who are increasingly looking beyond the traditional financial metrics to gauge a company's long-term viability and resilience amid significant uncertainties.

Furthermore, our study attempts to expand the understanding of OC's impact on crisis returns by considering the influence of CEO characteristics as a moderating factor. As the highest decision-maker in a company, the CEO influences the company's actions and performance through strategic decisions, particularly in resource allocation and utilization (Miller et al., 2015; Setiawan & Gestanti, 2022). One of the key factors influencing the characteristics and performance of a CEO is whether they possess general managerial abilities that are not confined to a specific industry, company, or domain (G. Chen et al., 2021; Li & Patel, 2019).

According to Custódio et al. (2013), CEOs can be classified as generalists or specialists by their general managerial abilities. Generalist CEOs possess a broader range of management knowledge and skills, while specialist CEOs have more focused expertise specific to an industry, firm, or domain (G. Chen et al., 2021). The broad expertise of generalist CEOs contributes to managerial efficiency, as they possess strategic decision-making skills, foster corporate innovation, handle complex tasks, and maintain effective communication with shareholders (Li & Patel, 2019; Ma et al., 2021). Firms with generalist CEOs tend to show higher levels of innovation (Agnihotri & Bhattacharya, 2021), achieve more efficient investment performance (Chatjuthamard et al., 2022; Evdokimov et al., 2022), and attain higher organizational and financial performance during the crisis period (Jebran & Chen, 2022). Therefore, we examine the contribution of a generalist CEO to firm performance during a crisis period by evaluating the moderating role in the relationship between OC and crisis returns.

Our empirical analysis encompasses two crisis periods, the GFC and COVID-19, along with their adjacent years, to scrutinize the distinct impact of OC during times of crisis compared to non-crisis periods. We sourced stock returns and financial variables data from CRSP and COMPUSTAT databases. The results indicate that while OC positively correlates with stock returns in non-crisis periods, its influence on returns intensifies significantly during crises. This pattern holds robustly significant even when accounting for firm-specific factors and using instrumental variable models. These findings suggest that investors tend to favor firms with higher OC during crises, valuing it as a key contributor to corporate sustainability.

Additionally, our analysis reveals that the correlation between OC and crisis-period returns is more pronounced in companies led by generalist CEOs. In contrast, firms with specialist CEOs do not exhibit a significant moderating effect. This result underscores the importance of broad managerial skills in leveraging OC to navigate the uncertainties of economic crises effectively. Regarding economic significance, ceteris paribus, a one-standard-deviation increase in OC is associated with an increase of 5.13 and 2.42 percentage points in buy-and-hold crisis returns during the GFC and COVID-19 periods, respectively.

Our findings contribute to the existing literature on the impact of OC on corporate sustainability. Previous empirical studies have primarily focused on the role of OC in enhancing a firm's accounting and stock market performance during non-crisis periods (Eisfeldt & Papanikolaou, 2013; Lev et al., 2009). Our research extends this understanding by examining the relationship between OC and stock performance during crisis periods, thereby illuminating the role of OC in corporate sustainability. Additionally, our study enriches the literature on generalist CEOs by uncovering a new aspect of CEOs' general managerial abilities: their influence on a firm's sustainability through effective management of OC. Further, this study highlights the role of OC in mitigating external shocks during economic crises, providing corporate insiders with insights into resource allocation strategies to prepare for external shocks. For investors, our study suggests considering OC and CEO characteristics as key factors in managing stock portfolios during crises. Specifically, allocating more investment to firms with higher OC and those led by generalist CEOs could improve performance during crises.

The subsequent sections of the paper are structured as follows: Section 2 delves into the foundational theoretical framework and hypothesis development. Section 3 provides an overview of the empirical methodology, encompassing data sources and variables. Moving forward, Section 4 presents the results of our analysis, examining the influence of OC on crisis returns and the moderating effect of generalist CEOs. Section 5 elaborates on the robustness tests. Finally, in Section 6, we draw our conclusions.

2. Literature review and hypothesis development

The significance of OC in enhancing efficiency and productivity for sustainable competitive advantage has long been acknowledged in economics and management. The concept of OC was first introduced by Prescott and Visscher (1980), who defined it as acquiring and applying key resources and skills that boost a firm's productivity. We define OC as a firm's intrinsic resource, comprising practices, processes, designs, culture, and know-how that efficiently utilize given resources to generate higher returns consistently. Existing studies emphasize that the knowledge and tacit intangible capital required to efficiently perform and systematize a firm's processes are difficult to imitate or transfer (Evenson & Westphal, 1995). This perspective aligns with the resource-based view that critical resources are difficult to trade, imitate, or substitute, and existing research has argued that OC is an important competitive source as a unique resource of the firm (Hasan, 2018; Squicciarini & Le Mouel, 2012). Motivated by these prior studies, we posit that OC is embodied within the firm.

Existing studies found that higher OC is associated with greater operational performance that cannot be explained by typical factors such as intangible assets, Research and Development (R&D), or advertising expenditures (Chan et al., 2001; Lev & Sougiannis, 1996). Lev and Radhakrishnan (2005) demonstrated the significant impact of a firm's OC on its operational efficiency. Importantly, recent

Table 1

Descriptive Statistics and Correlations. The dataset is derived from company information in the COMPUSTAT and CRSP databases, with accounting data reflecting the year-end of the preceding year for each testing year. The stock return data covers the periods from 2005 to 2013, for the GFC, from 2018 to 2022, and for COVID-19. OC is the perpetual value of SG&A computed by equation (2) and (3). To estimate the initial stock of OC in the firm's first non-missing COMPUSTAT record, we use the industrial average growth rate to fill the missing value of SG&A. Firm's daily Raw Return computed for each each testing period. Abnormal Return is the market model-adjusted daily return over the testing period, with parameters derived from the stock market model calculated for the sixty months leading up to the day before the start of the test period utilizing the CRSP value-weighted index as the market proxy. Variables based on accounting data were analyzed using year-end information from the previous year. All variables are winsorized at the 1st and 99th percentiles to eliminate outliers, and detailed definitions are provided in Appendix B.

Panel A: Statistical Overview – GFC

	Number ofObservation	Mean	Std.Dev.	Min	25 percentage points	Median	75 percentage points	Max
OC	32,472	0.640	0.626	0.014	0.198	0.457	0.863	3.383
Raw Return	22,127	0.034	0.378	−0.819	−0.171	0.036	0.220	1.568
Abn. return	17,987	−0.039	0.312	−0.746	−0.211	−0.052	0.100	1.241
Crisis Raw Return	2,468	−0.526	0.242	−0.947	−0.704	−0.546	−0.378	0.256
Crisis Abn. return	1,932	−0.134	0.452	−0.893	−0.464	−0.168	0.095	1.459
Market capitalization	28,971	6.244	2.331	0.492	4.675	6.321	7.840	11.480
Long-term debt	32,299	0.198	0.226	0.000	0.001	0.133	0.308	1.070
Short-term debt	32,397	0.045	0.089	0.000	0.000	0.008	0.046	0.537
Cash holdings	32,292	0.060	0.086	0.000	0.009	0.028	0.072	0.503
Profitability	32,320	0.095	0.140	−0.512	0.053	0.110	0.165	0.421
Book-to-market	28,874	1.355	2.004	−0.091	0.491	0.834	1.413	15.638
Negative B/M	32,784	0.010	0.101	0.000	0.000	0.000	0.000	1.000
Momentum	21,169	0.075	0.500	−0.751	−0.221	0.001	0.251	2.908
Idiosyncratic risk	18,211	0.034	0.024	0.011	0.021	0.028	0.038	0.188

Panel B: Statistical Overview – COVID-19

	Number ofObservation	Mean	Std.Dev.	Min	25 percentage points	Median	75 percentage points	Max
OC	15,580	0.522	0.527	0.014	0.169	0.353	0.683	2.843
Raw Return	7,113	−0.089	0.198	−0.707	−0.151	−0.041	0.028	0.331
Abn. return	7,113	−0.017	0.150	−0.509	−0.079	−0.012	0.053	0.435
Crisis Raw Return	1,417	−0.402	0.173	−0.802	−0.511	−0.391	−0.287	0.047
Crisis Abn. return	1,413	−0.073	0.259	−0.620	−0.249	−0.076	0.097	0.633
Market capitalization	14,142	6.995	2.395	1.356	5.362	7.128	8.664	12.204
Long-term debt	15,598	0.247	0.231	0.000	0.040	0.206	0.377	1.113
Short-term debt	15,648	0.046	0.082	0.000	0.004	0.016	0.049	0.530
Cash holdings	15,616	0.087	0.143	0.000	0.011	0.035	0.091	0.776
Profitability	15,636	−0.040	0.215	−1.000	−0.077	0.018	0.070	0.332
Book-to-market	14,092	1.228	1.672	−0.197	0.360	0.735	1.398	11.329
Negative B/M	15,712	0.016	0.124	0.000	0.000	0.000	0.000	1.000
Momentum	7,113	0.088	0.395	−0.644	−0.153	0.030	0.260	1.754
Idiosyncratic risk	7,113	0.022	0.009	0.008	0.015	0.020	0.027	0.051

Panel C: Correlation Matrix

Variables	OC	Raw Ret.	Abn Ret.	Crisis Raw Ret.	Crisis Abn. Ret.	Market Cap.	Long Debt	ShortDebt	Cash Holdings	Profit	Book-to-market	Negative B/M	Momen-tum
Raw Return	0.028***												
Abnormal Return	0.023***	0.740***											
Crisis Raw Return	0.088***	1.000***	0.766***										
Crisis Abn. return	0.134***	0.754***	1.000***	0.767***									

(*continued on next page*)

Table 1 (*continued*)

Panel C: Correlation Matrix Variables	OC	Raw Ret.	Abn Ret.	Crisis Raw Ret.	Crisis Abn. Ret.	Market Cap.	Long Debt	ShortDebt	Cash Holdings	Profit	Book-to-market	Negative B/M	Momentum
Market Cap.	−0.357***	0.013	0.090***	0.201***	0.334***								
Long-term debt	−0.160***	−0.024***	−0.016**	−0.179***	−0.068***	0.101***							
Short-term debt	0.063***	−0.021***	−0.035***	−0.100***	−0.076***	−0.221***	−0.053***						
Cash holdings	0.121***	0.016**	−0.002	0.034	−0.017	−0.137***	−0.193***	−0.066***					
Profitability	0.220***	0.042***	0.067***	0.124***	0.113***	0.386***	0.078***	−0.114***	−0.245***				
Book-to-market	0.037***	−0.048***	−0.062***	−0.207***	−0.190***	−0.352***	0.001	0.197***	−0.090***	−0.152***			
Negative B/M	0.047***	0.001	0.016	0.013	0.051**	−0.101***	0.279***	0.183***	0.014	−0.028***	−0.078***		
Momentum	−0.016	0.562***	0.535***	0.472***	0.383***	0.022***	−0.039***	−0.049***	0.067***	0.076***	−0.147***	−0.001	
Idiosyncratic risk	0.185***	0.127***	−0.117***	−0.189***	−0.258***	−0.406***	−0.021***	0.112***	0.136***	−0.240***	0.081***	0.060***	0.251***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2
OC and Crisis Returns during the GFC. In Table 2, we render the results of a regression analysis that examines the relationship between OC and stock returns during the GFC period. Stock Returns are computed as daily returns from 15th September of the testing year to 9th March of the following year. The study covers the period from 2005 to 2013, with 2008–2009 considered the crisis period and the remaining years analyzed as normal periods. Industry sector-specific dummy variables are categorized based on the SIC two-digit level. All firm-specific variables were winsorized each year at the one percentage point level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicates significance at the 10, 5, and 1 percentage points, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
OC	0.010*	0.010**	0.011*	0.009*	0.117***	0.112***
	(0.005)	(0.005)	(0.006)	(0.005)	(0.015)	(0.014)
Crisis	−0.006	−0.004	−0.039***	−0.032***	−0.037***	−0.031**
	(0.013)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)
OC*Crisis	0.093***	0.084***	0.091***	0.087***	0.082***	0.081***
	(0.014)	(0.013)	(0.014)	(0.013)	(0.015)	(0.014)
Market Cap.			−0.003*	0.003**	−0.010	0.001
			(0.002)	(0.001)	(0.008)	(0.007)
Long-term debt			0.026	−0.004	−0.031	−0.052
			(0.016)	(0.015)	(0.034)	(0.032)
Short-term debt			0.008	−0.028	−0.046	−0.111*
			(0.040)	(0.037)	(0.062)	(0.059)
Cash holdings			−0.022	−0.009	−0.009	0.024
			(0.038)	(0.035)	(0.046)	(0.043)
Profitability			−0.003	−0.037	−0.072*	−0.125***
			(0.025)	(0.023)	(0.043)	(0.041)
Book-to-Market			−0.028***	−0.033***	−0.048***	−0.056***
			(0.002)	(0.002)	(0.004)	(0.003)
Negative B/M			0.075**	0.056*	0.101*	0.068
			(0.035)	(0.033)	(0.053)	(0.050)
Momentum			−0.056***	−0.052***	−0.064***	−0.059***
			(0.005)	(0.005)	(0.005)	(0.005)
Idiosyncratic risk			−2.329***	−0.964***	−2.091***	−0.692***
			(0.141)	(0.132)	(0.213)	(0.201)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	17,884	17,884	16,685	16,685	16,685	16,685
Adj. R-Square	0.20	0.05	0.26	0.08	0.16	−0.12

studies have additionally revealed an association between OC and stock performance, highlighting the positive relationship between these two factors (Boubaker et al., 2022; Iqbal et al., 2022).

Building on this foundation, more recent studies such as Lev and Sougiannis (1996) and Chan et al. (2001) have demonstrated that firms with higher OC exhibit superior operational performance even after controlling other intangible assets such as R&D and advertising expenditures. Expanding on these insights, recent studies by Boubaker et al. (2022) and Iqbal et al. (2022) have revealed a positive correlation between OC and stock performance. Furthermore, some previous studies have claimed its potential impacts on corporate sustainability due to its sustainable nature and established a positive correlation between OC and sustainable competitive factors, including firm reputation, corporate social responsibility investment, and employee satisfaction (Attig & Cleary, 2015; Cui et al., 2021; Edmans, 2011).

To fully understand OC's influence on a firm's sustainable competitiveness, exploring its influence on stock returns during economic crises is crucial. In the literature on crisis period returns, numerous studies have identified the significance of sustainability-related factors such as social capital (Lins et al., 2017), ESG practices (Broadstock et al., 2021), branding (Johansson et al., 2012), and R&D investments (Lome et al., 2016). Assuming OC's association with sustainable competitiveness, we claim that investors prefer firms with higher OC during crises. This behavior could result in a relatively smaller decline in firm value than those with lower OC.

Hypothesis 1:. Firms with higher OC are associated with better market performance during a crisis.

One of the key perspectives in existing research on OC is that it is embodied in a firm's key talents, including CEOs (Eisfeldt & Papanikolaou, 2013; Gao et al., 2021; Li et al., 2018). *The human capital of a CEO is notably crucial to firm performance due to its significant influence on decision-making* (Finkelstein et al., 2009; Liu et al., 2018; Meyer-Doyle et al., 2019). *Recent studies highlight the importance of CEOs' general managerial abilities for strategic decision-making and efficient resource utilization. In this context, CEOs are often categorized as either generalists with broad managerial knowledge applicable across industries or specialists with focused expertise in a particular sector* (Custódio et al., 2013; Custódio et al., 2019; Li & Patel, 2019).

Existing literature presents mixed views on the impact of generalist CEOs on corporate performance. On one hand, empirical evidence suggests that their broad expertise contributes to managerial efficiency. Generalist CEOs are associated with strategic decision-making proficiency (Crossland et al., 2014), fostering corporate innovation (Custódio et al., 2019), handling complex tasks (Custódio et al., 2013), and delivering shareholder benefits (Betzer et al., 2020). These findings indicate that generalist CEOs may be more adept at adapting to volatile economic conditions.

Table 3
OC and Crisis Returns during the COVID-19. In Table 3, we render the results of a regression analysis that examines the relationship between explanatory variables and stock returns during the COVID-19 period. Stock returns during the COVID-19 period are computed as daily returns from 19th February 2020 to 23rd March 2020, while non-crisis period stock returns are calculated for each year from 2018 to 2022, excluding the crisis period. The regression model is designed to be consistent with the analysis conducted during the GFC period in Table 2. All firm-specific variables were winsorized each year at the one percentage point level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicates significance at the 10, 5, and 1 percentage points, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
OC	0.014**	0.014*	0.009*	0.011*	0.054**	0.068***
	(0.005)	(0.006)	(0.005)	(0.006)	(0.017)	(0.020)
Crisis	−0.218***	−0.245***	−0.217***	−0.245***	−0.209***	−0.230***
	(0.009)	(0.010)	(0.009)	(0.010)	(0.009)	(0.011)
OC*Crisis	0.034***	0.032***	0.039***	0.036***	0.046***	0.043***
	(0.011)	(0.012)	(0.012)	(0.011)	(0.012)	(0.012)
Market Cap.			0.005***	0.006***	0.041***	0.046***
			(0.001)	(0.001)	(0.006)	(0.007)
Long-term debt			−0.052***	−0.068***	−0.073**	−0.089**
			(0.009)	(0.010)	(0.023)	(0.027)
Short-term debt			−0.062*	−0.083*	−0.100*	−0.143*
			(0.028)	(0.033)	(0.048)	(0.056)
Cash holdings			0.005	0.006	0.017	0.011
			(0.022)	(0.026)	(0.028)	(0.033)
Profitability			0.135***	0.169***	0.174***	0.220***
			(0.015)	(0.017)	(0.023)	(0.028)
Book-to-Market			−0.007***	−0.008***	−0.003	−0.003
			(0.001)	(0.002)	(0.003)	(0.004)
Negative B/M			−0.010	−0.006	−0.044	−0.053
			(0.015)	(0.018)	(0.030)	(0.036)
Momentum			−0.035***	−0.039***	−0.059***	−0.067***
			(0.004)	(0.005)	(0.004)	(0.005)
Idiosyncratic risk			1.278***	1.682***	3.737***	4.662***
			(0.213)	(0.253)	(0.422)	(0.501)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	7,025	7,025	6,970	6,970	6,970	6,970
Adj. R-Square	0.65	0.12	0.66	0.16	0.63	0.18

On the other hand, there are concerns that generalist CEOs, due to their broader but shallower firm-specific knowledge, might hinder optimal resource utilization and negatively impact firm performance during routine operations (Li & Patel, 2019). Moreover, there could be a risk that greater availability of external top management opportunities might encourage generalist CEOs to undertake excessive risks, potentially leading to significant agency problems, financial weaknesses, and greater volatility in corporate performance (Gounopoulos & Pham, 2018; Ma et al., 2021; Mishra, 2014).

In crises, the demand for CEOs with diverse managerial abilities to improve organizational outcomes becomes more pronounced (Crossland et al., 2014; Custódio et al., 2019; Li & Patel, 2019). With their ability to address various business challenges through diverse professional experiences, generalist CEOs are well-suited to navigate uncertainties and complexities (Lazear, 2012). CEOs with a broad managerial background tend to develop expertise in aligning firm-specific resources with market changes (Garicano & Rossi-Hansberg, 2006), fostering investor relations (Murphy & Zabojnik, 2007), and aiding in financial distress recovery (Gilson & Vetsuypens, 1993). Therefore, we hypothesize that in crisis periods, a generalist CEO can leverage a wider range of strategies to optimize the use of OC and navigate through crises.

Hypothesis 2:. A Generalist CEO positively moderates the association between OC and crisis period returns.

3. Data and methods

3.1. Sample formation

Our main sample consists of firms in the United States during the GFC and COVID-19 periods. The GFC spans from September 15, 2008, to March 9, 2009, aligned with Lehman Brothers' bankruptcy and concluding at the nadirs of the S&P 500 and MSCI World Equity Index (Frankel & Saravelos, 2012). Our sample spans pre-crisis and post-crisis periods, allowing us to discern OC effects in normal and crisis, specifically from 2005 to 2013, including four years before and after the GFC.[1] For the COVID-19 period, data spans

[1] For robustness testing purposes, we additionally analyze a shorter sample including two years before and after the GFC, and find the same outcomes as the analysis of the main sample. Detailed information is presented in Appendix C.

Table 4

Moderating Role of CEO's Background to OC and Raw Return during the Crises periods. This table provides regression estimates of the moderating influence of generalist and specialist CEOs on the relationship between OC and crisis returns. We conduct regression analysis by sub-sampling the generalist and specialist CEO dummies: The Generalist CEO indicator is set to one if the CEO's annual GAI is greater than or equal to the median and zero otherwise. The Specialist CEO indicator is set to one if the CEO's annual GAI is below the median and zero otherwise. Table 5 presents the findings from estimating the moderating effect of CEO type on the relationship between OC and crisis returns during GFC and COVID-19. We render the outcomes of a regression analysis based on the following equation: $Return_{i,t} = \beta_o + \beta_1\, OC_{i,t\text{-}1} + \beta_2\, Crisis_t + \beta_3\, OC_{i,t\text{-}1} \times Crisis_t + \boldsymbol{\beta} \boldsymbol{X}_{i,t-1} +$ *Firm Fixed Effects* $+ e_{i,b}$. In these equations, $Return_{i,t}$ denotes the firm's Raw Return and Abnormal Return, while $OC_{i,t\text{-}1}$ represents the cumulative value up to the end of the preceding year for each respective testing period. The variable $Crisis_t$ is binary, distinguishing between the crisis and normal periods. $\boldsymbol{X}_{i,t-1}$ is a vector of control variables at last year-end. For analytical consistency, the analysis period and the composition of the dataset and control variables were structured to be consistent with Table 2. All firm-specific variables were winsorized each year at the one percentage point level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicates significance at the 10, 5, and 1 percentage points, respectively.

	Panel A: GFC Period				Panel B: COVID-19			
	Generalist CEO		Specialist CEO		Generalist CEO		Specialist CEO	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Raw Return	Abn. Return	Raw Return	Abn. Return	Raw Return	Abn. Return	Raw Return	Abn. Return
OC	0.024**	0.199***	0.022**	0.166***	0.093*	0.114**	0.079*	0.107**
	(0.010)	(0.028)	(0.010)	(0.035)	(0.044)	(0.055)	(0.043)	(0.052)
Crisis	−0.034*	−0.037*	−0.024	−0.041*	−0.145***	−0.162***	−0.119***	−0.117***
	(0.020)	(0.021)	(0.020)	(0.021)	(0.020)	(0.025)	(0.021)	(0.025)
OC*Crisis	0.075***	0.063***	0.024	0.021	0.065**	0.082***	0.015	0.030
	(0.022)	(0.023)	(0.025)	(0.026)	(0.021)	(0.027)	(0.022)	(0.026)
Market Cap.	−0.003	0.043***	−0.004	0.004	0.034**	0.033*	0.007	0.014
	(0.003)	(0.016)	(0.003)	(0.015)	(0.013)	(0.017)	(0.013)	(0.016)
Long-term debt	0.044	0.058	0.027	0.108*	−0.069	−0.106	−0.071	−0.087
	(0.028)	(0.058)	(0.027)	(0.063)	(0.054)	(0.067)	(0.055)	(0.066)
Short-term debt	−0.026	−0.037	0.117	0.289**	−0.181	−0.241	−0.154	−0.183
	(0.077)	(0.109)	(0.085)	(0.133)	(0.117)	(0.148)	(0.122)	(0.147)
Cash holdings	−0.005	0.084	0.090	0.139*	−0.098	−0.144	0.069	0.048
	(0.069)	(0.087)	(0.064)	(0.080)	(0.064)	(0.081)	(0.065)	(0.078)
Profitability	−0.164***	−0.258***	−0.167***	−0.266***	0.310***	0.432***	0.439***	0.538***
	(0.051)	(0.086)	(0.045)	(0.080)	(0.069)	(0.087)	(0.084)	(0.101)
Book-to-Market	−0.021***	−0.028***	−0.028***	−0.055***	−0.011	−0.029	−0.031**	−0.034*
	(0.004)	(0.007)	(0.005)	(0.008)	(0.012)	(0.015)	(0.012)	(0.014)
Negative B/M	0.098	0.188*	0.139**	−0.010	−0.005	−0.024	0.016	0.013
	(0.070)	(0.100)	(0.066)	(0.100)	(0.039)	(0.049)	(0.031)	(0.037)
Momentum	−0.060***	−0.107***	−0.054***	−0.099***	−0.077***	−0.088***	−0.056***	−0.068***
	(0.011)	(0.012)	(0.010)	(0.011)	(0.010)	(0.012)	(0.010)	(0.012)
Idiosyncratic risk	−3.090***	−4.054***	−3.032***	−3.325***	2.780*	3.213*	4.750***	5.139***
	(0.243)	(0.390)	(0.280)	(0.454)	(1.089)	(1.374)	(1.068)	(1.291)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	No	No	No	No	No	No
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,938	2,938	3,195	3,195	1,608	1,608	1,847	1,847
Adj. R-Square	0.44	0.06	0.44	0.04	0.42	0.10	0.41	0.08

Table 5

OC and Crises Returns: Two-Stage Instrumental-Variable Estimation. In Table 5, we render the results of a 2SLS regression analysis to address endogeneity concerns during the GFC and COVID-19 period. The instrumental variables in the first stage test are the industry-level mean OC based on four-digit SIC codes for each year and UI Benefits in a firm's headquarters state. For analytical consistency, the analysis period and the composition of the dataset and control variables were structured to be consistent with Table 2. All firm-specific variables were winsorized each year at the one percentage point level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicates significance at the 10, 5, and 1 percentage points, respectively.

Panel A: Two-Stage Least Square Test for GFC Period					
	1st Stage	2nd stage		Lewbel Approach	
	(1)	(2)	(3)	(4)	(5)
	OC	Raw Return	Abn. return	Raw Return	Abn. return
OC		0.068***	0.074***	0.076**	0.081***
		(0.021)	(0.018)	(0.032)	(0.036)
Crisis		−0.094***	−0.081***	−0.067***	−0.059***
		(0.024)	(0.026)	(0.023)	(0.021)
OC*Crisis		0.103***	0.096***	0.071***	0.064***
		(0.027)	(0.026)	(0.024)	(0.021)
UI Benefit (Inst. Var.)	0.039**				
	(0.019)				
Ind. Mean OC (Inst.Var.)	0.921***				
	(0.013)				
Market Cap.	−0.009**	−0.048***	−0.027**	−0.046***	−0.036**
	(0.004)	(0.014)	(0.013)	(0.016)	(0.017)
Long-term debt	0.005	−0.029	−0.052	−0.027	−0.056
	(0.012)	(0.039)	(0.038)	(0.046)	(0.044)
Short-term debt	0.042	0.081	0.019	0.086	0.027
	(0.041)	(0.093)	(0.091)	(0.094)	(0.091)
Cash holdings	−0.069*	−0.004	0.041	−0.003	0.037
	(0.037)	(0.069)	(0.064)	(0.073)	(0.066)
Profitability	−0.041	−0.291***	−0.285***	−0.273***	−0.262***
	(0.026)	(0.072)	(0.069)	(0.081)	(0.084)
Book-to-Market	−0.007**	−0.071***	−0.083***	−0.076***	−0.087***
	(0.003)	(0.009)	(0.008)	(0.016)	(0.013)
Negative B/M	−0.019	0.079	0.073	0.071	0.064
	(0.035)	(0.064)	(0.061)	(0.121)	(0.114)
Momentum	0.017***	−0.059***	−0.051***	−0.056***	−0.053***
	(0.003)	(0.008)	(0.008)	(0.009)	(0.008)
Idiosyncratic risk	−0.348**	−2.716***	−1.414***	−2.811***	−1.349***
	(0.152)	(0.341)	(0.339)	(0.492)	(0.476)
Four-Factor loadings	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	No	No	No
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Weak instrument test:					
Cragg–Donald's Wald F-Statistic	2,817			2,214	2,214
Stock-Yogo Critical Value	19.93			21.28	21.28
Overidentification test:					
Hansen J (p-value)		0.44	0.47	0.21	0.18
Panel B: Two-Stage Least Square Test for COVID-19 Period					
	1st Stage	2nd stage		Lewbel Approach	
	(1)	(2)	(3)	(4)	(5)
	OC	Raw Return	Abn. return	Raw Return	Abn. return
OC		0.291**	0.381***	0.106**	0.117**
		(0.134)	(0.146)	(0.051)	(0.057)
Crisis		−0.182***	−0.193***	−0.176***	−0.184***
		(0.011)	(0.014)	(0.017)	(0.018)
OC*Crisis		0.041***	0.057***	0.043**	0.051***
		(0.014)	(0.018)	(0.011)	(0.013)
UI Benefit (Inst. Var.)	0.034***				
	(0.011)				
Ind. Mean OC (Inst.Var.)	0.136***				
	(0.011)				
Market Cap.	−0.103***	0.049***	0.068***	0.021*	0.016
	(0.007)	(0.013)	(0.024)	(0.011)	(0.017)
Long-term debt	−0.419***	0.048	0.054	−0.069*	−0.107***
	(0.023)	(0.064)	(0.067)	(0.036)	(0.040)
Short-term debt	−0.431***	0.081	0.064	−0.059	−0.106
	(0.049)	(0.086)	(0.093)	(0.067)	(0.072)
Cash holdings	−0.014	0.018	0.003	0.006	−0.002
	(0.021)	(0.038)	(0.043)	(0.036)	(0.046)
Profitability	0.081**	0.364***	0.417***	0.378***	0.426***

(*continued on next page*)

Table 5 (*continued*)

Panel B: Two-Stage Least Square Test for COVID-19 Period					
	1st Stage	2nd stage		Lewbel Approach	
	(1)	(2)	(3)	(4)	(5)
	(0.036)	(0.041)	(0.044)	(0.037)	(0.043)
Book-to-Market	−0.069***	−0.001	−0.001	−0.026***	−0.032***
	(0.004)	(0.014)	(0.017)	(0.009)	(0.012)
Negative B/M	0.093***	−0.073**	−0.079**	−0.041	−0.049
	(0.026)	(0.036)	(0.039)	(0.026)	(0.031)
Momentum	0.009*	−0.057***	−0.063***	−0.054***	−0.061***
	(0.005)	(0.004)	(0.005)	(0.006)	(0.008)
Idiosyncratic risk	−0.327	4.134***	5.127***	4.219***	5.096***
	(0.401)	(0.517)	(0.628)	(0.524)	(0.613)
Four-Factor loadings	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	No	No	No
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Weak instrument test:					
Cragg–Donald's Wald F-Statistic	74.51			53.61	54.29
Stock-Yogo Critical Value	19.93			21.01	21.01
Overidentification test:					
Hansen J (p-value)		0.61	0.64	0.27	0.23

from February 19 to March 23, reflecting the highest and lowest points of the S&P 500 index during the first half of 2020 (Cox et al., 2020). The COVID-19 sample covers 2018 to 2022, limited by data availability in the latest year.

We collect daily stock return data from CRSP and annual accounting data from COMPUSTAT. Accounting data are based on the last year ending before each testing year. Financial firms (SIC 6000–6999) are excluded due to significant government support received during the crisis. Additionally, regulated utilities (SIC 4900–4999) and companies in public service, international affairs, or non-operating establishments (SIC 9000 +) are excluded to maintain comparability, as government support, regulation, and supervision can impact their comparability with other firms.[2] After consolidating companies using the COMPUSTAT and CRSP databases, we obtained the final sample of 4,492 and 3,813 firms meeting these criteria for the GFC and COVID-19 periods.

3.2. Dependent variables

This study employs two stock return variables: *Raw Return* and *Abnormal Return*. *Raw Return* represents the unadjusted buy-and-hold returns during the estimation period for stock returns in each crisis period of the GFC and COVID-19. We additionally analyze abnormal returns. Previous analyses of the positive correlation between OC and abnormal returns verified that OC influences increases in a company's productivity, sales, and profits, resulting in stock returns that exceed market-expected returns (Lev et al., 2009). By conducting an additional analysis with abnormal returns as the dependent variable, we examine whether OC contributes to crisis returns that exceed market-expected returns as a factor of sustainable competitive advantage. *Abnormal Return* measures the differential between the firm's expected return and *Raw Return.* The expected return is computed using the market model with the CRSP value-weighted index employed as the market proxy. We estimate the expected return over 60 months, extending until the day immediately preceding the commencement of the period of *Raw Return* for each respective year.

3.3. Organization capital

SG&A encompasses a spectrum of expenditures for enhancing a firm's intellectual capital, business operations, and system efficiencies. These expenses include, but are not limited to, investments in information technology, consulting services, employee training, advertising and marketing expenditures, R&D outlays, and investments in information systems and distribution channels, contributing to the accumulation of OC.

We measure OC following the methodology of Eisfeldt and Papanikolaou (2013), which is an accumulation of SG&A, by employing the perpetual inventory method. Our annual calculation of the OC stock involves the aggregation of deflated SG&A expenses, and this process is carried out as follows in Equation (1):

$$OC_{i,t} = OC_{i,t-1}(1-\delta_0) + \frac{SG\&A_{I,t}}{CPI_t} \tag{1}$$

where $OC_{i,t-1}$ represents the firm-specific accumulated stock of OC until *t-1*, whereas $SG\&A_{i,t,}$ and CPI_t indicate the firm i's SG&A expenses and the consumer price index, respectively. We adopt a depreciation rate (δ_0) of 15 percentage points following Eisfeldt and

[2] We conducted an additional analysis on a database that excludes small-cap stocks with a market capitalization below $250 million, as these stocks tend to have limited liquidity, wider bid-ask spreads, and greater susceptibility to price pressure effects from trading. The results remain unchanged, and these findings can be found in Appendix D.

Table 6

OC and Operational Performance: ROA & ROE. Panels A and B of Table 6 present the results of a regression analysis examining the relationship between OC and operational performance indicators, ROA and ROE, during the GFC and COVID-19 periods. The regression model is designed to be consistent with Table 2, with ROA measured by net income by total assets and ROE measured by net income by common equity total. All firm-specific variables were winsorized each year at the one percent level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: GFC Period						
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ROE	ROA	ROE	ROA	ROE
OC	0.042***	0.046***	0.005**	0.045***	0.091***	0.262***
	(0.002)	(0.010)	(0.002)	(0.011)	(0.005)	(0.027)
Crisis	0.003	−0.011	0.011**	−0.001	0.001	−0.026
	(0.005)	(0.023)	(0.005)	(0.023)	(0.004)	(0.023)
OC*Crisis	0.013**	0.051**	0.018***	0.053**	0.013***	0.059**
	(0.006)	(0.025)	(0.005)	(0.026)	(0.005)	(0.026)
Market Cap.			0.007***	0.019***	0.017***	0.026*
			(0.001)	(0.003)	(0.003)	(0.014)
Long-term debt			−0.017***	0.131***	0.014	0.192***
			(0.006)	(0.030)	(0.011)	(0.061)
Short-term debt			0.008	0.075	0.060***	0.233**
			(0.014)	(0.073)	(0.020)	(0.110)
Cash holdings			−0.090***	0.046	0.009	0.090
			(0.014)	(0.068)	(0.015)	(0.081)
Profitability			0.484***	0.775***	0.097***	0.261***
			(0.008)	(0.038)	(0.009)	(0.052)
Book-to-Market			−0.004***	−0.012***	−0.005***	−0.012*
			(0.001)	(0.004)	(0.001)	(0.006)
Negative B/M			0.048***	−0.136**	0.049***	−0.404***
			(0.013)	(0.064)	(0.017)	(0.094)
Momentum			0.009***	0.023***	0.008***	0.018**
			(0.002)	(0.009)	(0.002)	(0.009)
Idiosyncratic risk			−0.618***	−1.044***	0.014	0.142
			(0.051)	(0.257)	(0.069)	(0.377)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	18,059	18,047	16,773	16,761	16,773	16,761
Adj. R-Square	0.05	0.03	0.33	0.06	0.47	0.13
Panel B: COVID-19 Period						
	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	ROE	ROA	ROE	ROA	ROE
OC	0.052***	0.147***	0.057***	0.151***	0.145***	0.262***
	(0.004)	(0.025)	(0.004)	(0.033)	(0.013)	(0.027)
Crisis	0.008	−0.011	−0.026***	−0.046	0.005	−0.026
	(0.005)	(0.031)	(0.004)	(0.033)	(0.004)	(0.023)
OC*Crisis	0.017**	0.112**	0.023***	0.117**	0.020***	0.059**
	(0.008)	(0.055)	(0.008)	(0.057)	(0.007)	(0.026)
Market Cap.			0.004***	0.019***	0.031***	0.026*
			(0.001)	(0.006)	(0.004)	(0.014)
Long-term debt			0.015**	0.130**	0.088***	0.192***
			(0.007)	(0.056)	(0.018)	(0.061)
Short-term debt			0.077***	0.245	0.212***	0.233**
			(0.026)	(0.192)	(0.039)	(0.110)
Cash holdings			−0.083***	−0.307**	−0.054**	0.090
			(0.019)	(0.145)	(0.021)	(0.081)
Profitability			0.521***	0.980***	−0.084***	0.261***
			(0.013)	(0.096)	(0.018)	(0.052)
Book-to-Market			−0.007***	−0.008	0.000	−0.012*
			(0.001)	(0.009)	(0.003)	(0.006)
Negative B/M			0.011	−0.199**	0.046*	−0.404***
			(0.013)	(0.099)	(0.025)	(0.094)
Momentum			−0.006*	−0.040	−0.004	0.018**
			(0.003)	(0.026)	(0.003)	(0.009)
Idiosyncratic risk			−1.105***	−2.856**	1.737***	0.142
			(0.192)	(1.425)	(0.359)	(0.377)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	7,005	6,988	5,428	5,414	5,428	5,414
Adj. R-Square	0.08	0.02	0.38	0.05	0.42	0.11

Table 7

Industry-Adjusted OC and Crisis Returns. Panels A and B of Table 7 present the results of a regression analysis examining the relationship between industry-adjusted OC and stock returns during the GFC and COVID-19 periods. Industry-adjusted OC (Ind_Adj_OC) is measured by subtracting the SIC two-digit level average OC from the firm's OC, and the regression model is designed to be consistent with Table 2. All firm-specific variables were winsorized each year at the one percent level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: GFC Period						
	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
Ind_Adj_OC	0.012*	0.011*	0.016**	0.012*	0.084***	0.103***
	(0.007)	(0.006)	(0.007)	(0.007)	(0.017)	(0.016)
Crisis	0.032***	0.019**	−0.016*	−0.015*	−0.019**	−0.014*
	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)
Ind_Adj_OC *Crisis	0.079***	0.072***	0.074***	0.071***	0.061***	0.065***
	(0.017)	(0.015)	(0.017)	(0.015)	(0.017)	(0.016)
Market Cap.			−0.004***	0.001	−0.030***	−0.020***
			(0.002)	(0.001)	(0.008)	(0.007)
Long-term debt			0.036**	0.010	−0.019	−0.024
			(0.016)	(0.015)	(0.034)	(0.032)
Short-term debt			0.026	−0.006	−0.029	−0.078
			(0.040)	(0.038)	(0.063)	(0.059)
Cash holdings			−0.003	0.021	−0.002	0.030
			(0.037)	(0.035)	(0.046)	(0.043)
Profitability			0.090***	0.100***	0.113***	0.148***
			(0.021)	(0.020)	(0.029)	(0.028)
Book-to-Market			−0.026***	−0.031***	−0.050***	−0.058***
			(0.002)	(0.002)	(0.004)	(0.003)
Negative B/M			0.074**	0.052	0.103*	0.067
			(0.035)	(0.033)	(0.053)	(0.050)
Momentum			−0.058***	−0.055***	−0.064***	−0.060***
			(0.005)	(0.005)	(0.005)	(0.005)
Idiosyncratic risk			−2.259***	−0.868***	−2.123***	−0.739***
			(0.141)	(0.132)	(0.214)	(0.201)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	17,884	17,884	16,688	16,688	16,688	16,688
Adj. R-Square	0.20	0.05	0.26	0.08	0.15	0.08
Panel B: COVID-19 Period						
	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
Ind_Adj_OC	0.009*	0.011*	0.010**	0.012*	0.026*	0.031*
	(0.005)	(0.006)	(0.005)	(0.007)	(0.015)	(0.018)
Crisis	−0.158***	−0.177***	−0.187***	−0.209***	−0.176***	−0.191***
	(0.007)	(0.009)	(0.008)	(0.010)	(0.009)	(0.011)
Ind_Adj_OC *Crisis	0.028**	0.026*	0.036***	0.031**	0.038***	0.035**
	(0.013)	(0.015)	(0.013)	(0.015)	(0.013)	(0.016)
Market Cap.			0.003***	0.003***	−0.005***	−0.007***
			(0.001)	(0.001)	(0.001)	(0.002)
Long-term debt			−0.060***	−0.078***	−0.081***	−0.096***
			(0.010)	(0.012)	(0.021)	(0.025)
Short-term debt			−0.087**	−0.122**	−0.052	−0.099
			(0.033)	(0.039)	(0.050)	(0.060)
Cash holdings			−0.006	−0.018	0.010	−0.005
			(0.026)	(0.031)	(0.031)	(0.038)
Profitability			0.129***	0.171***	0.303***	0.373***
			(0.019)	(0.023)	(0.033)	(0.040)
Book-to-Market			−0.010***	−0.012***	−0.023***	−0.028***
			(0.002)	(0.002)	(0.003)	(0.004)
Negative B/M			0.004	0.008	0.016	0.013
			(0.009)	(0.011)	(0.016)	(0.019)
Momentum			−0.024***	−0.026***	−0.041***	−0.048***
			(0.004)	(0.005)	(0.005)	(0.006)
Idiosyncratic risk			1.031***	1.345***	3.489***	4.299***
			(0.200)	(0.239)	(0.414)	(0.495)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	7,025	7,025	6,970	6,970	6,970	6,970
Adj. R-Square	0.47	0.12	0.48	0.16	0.48	0.11

Papanikolaou (2013) and Hasan (2018), the rate also utilized by the U.S. Bureau of Economic Analysis for estimating R&D capital.

Following Eisfeldt and Papanikolaou (2013), the initial stock of OC is estimated as in Equation (2):

$$OC_{i,t_0} = \frac{SG\&A_{i,t1}}{g + \delta_0} \tag{2}$$

where t_0 denotes the initial year of the firm found in the sample, g represents the average real growth rate of SG&A expenditures, which is 10.08 percentage points in our sample, and δ_0 represents the depreciation rate, which is 15 percentage points as in equation (1). In alignment with the methodologies presented by previous studies, we normalize the accumulation of SG&A by total assets (Hasan et al., 2021; Lev et al., 2009).

3.4. Estimating firms' initial SG&A

This section further elucidates the methodology employed to estimate the initial SG&A. As in equation (2), calculating the initial stock of OC requires a non-missing SG&A value in the year of the firm's founding or its first appearance in the database after its IPO, which is often not satisfied in the COMPUSTAT. We tackle the challenge of missing SG&A data by leveraging annual growth rates of OC, which are categorized based on firm age and SIC 2-digit code. While existing studies utilize age-specific average SG&A growth rates to estimate missing values (i.e., Peters and Taylor (2017)), we improve it by additionally taking into account the industry category, relying on two theories: the rivalry theory (Fairhurst & Nam, 2020; Francis et al., 2016; Lieberman & Asaba, 2006) and the life cycle theory (Berger & Udell, 1998; DeAngelo et al., 2006; Loderer & Waelchli, 2010). The following outlines sequential steps to estimate the initial SG&A as well as the initial capital stock of OC:

i. Defining age as the years elapsed since IPO or first appearance in COMPUSTAT.
ii. Utilizing the complete COMPUSTAT database from 1950 to 2022, calculate the logarithmic change in SG&A from the previous year.
iii. Computing the average SG&A growth rate for each age-and-industry category.
iv. Filling in missing SG&A observations by utilizing the average SG&A growth rate up to the earlier year between the firm's IPO or initial reporting in COMPUSTAT.
v. Applying the derived first-year SG&A to Equation (2) to calculate OC_{i,t_0}.

3.5. Generalist and Specialist CEO

We use GAI developed by Custódio et al. (2013) to categorize generalist and specialist CEOs. The GAI assesses the breadth of a CEO's human capital, drawing from their lifetime work experience in publicly traded companies before assuming their current CEO role. A CEO who has accumulated diverse experience across various industries, multiple firms, and different organizational sectors or has previously held the position of CEO is categorized as having broader or more general skills. The GAI dataset encompasses U.S. S&P 1,500 firms spanning 1992 to 2022, sourced from EXECUCOMP. Each CEO's profile is manually matched with the BoardEx database to acquire comprehensive data on their attributes, encompassing their entire professional history.

The GAI of CEO i in year t is defined as

$$GAI_{i,t} = 0.268X1_{i,t} + 0.312X2_{i,t} + 0.309X3_{i,t} + 0.218X4_{i,t} + 0.153X5_{i,t} \tag{3}$$

where X1 represents the count of distinct positions a CEO has occupied throughout their career, X2 signifies the number of firms where a CEO has been employed, X3 quantifies the variety of industries at the four-digit SIC code level in which a CEO has worked, X4 is the dummy variable, taking the value of 1 if a CEO has previously held a CEO position at another firm, and X5 is another dummy variable, set to 1 if a multidivisional firm has employed a CEO. (i.e., a firm that discloses multiple business segments in its reporting). The coefficients in equation (3) are derived by extracting common components using principal component analysis from five variables. Finally, we classify generalist CEOs as those exceeding the median of annual GAI, while specialist CEOs are those falling below the median of annual GAI.

3.6. Empirical methodology

We analyze whether the positive relation between OC and stock return is found in crisis periods. Furthermore, our study delves into the CEO's general management ability's impact on the relationship between OC and stock returns during the economic crisis.

Our baseline empirical test employs an ordinary least squares estimation to assess the relationship between OC and crisis return. We compiled longitudinal data for sampled firms, encompassing four and two years before and after the GFC and COVID-19. Overall, our regression equation is formulated as follows:

$$Return_{i,t} = \beta_0 + \beta_1 OC_{i,t-1} + \beta_2 Crisis_t + \beta_3 OC_{i,t-1} \times Crisis_t + \beta X_{i,t-1} + FirmFixedEffects + e_{i,t} \tag{4}$$

$Return_{i,t}$ denotes the *Raw Return* or *Abnormal Return*, $OC_{i,t-1}$ represents the firm's *OC* measured at the latest fiscal year-end before the

measurement of $Return_{i,t}$. $Crisis_t$ is a binary variable assigned a value of one to the data period during each economic crisis period and zero for the remaining period. The coefficient β_3 is of our interest. It indicates an impact of OC on firm value during the crisis period. We control various accounting- and market-level variables. Market capitalization is determined by taking the logarithm of the product of the closing price and the total number of outstanding shares. Long-term debt is calculated as the ratio of long-term debt to total assets, while Short-Term Debt is determined as the ratio of current liabilities related to debt to total assets. Cash Holdings are derived by dividing the sum of cash equivalent by total assets. Profitability is determined by dividing total assets into operating income. The Book-to-Market ratio is computed as the ratio of equity's book value to its market value. The Negative B/M is a binary indicator that takes the value of one when the book-to-market ratio is negative and zero otherwise. As Daniel and Titman (1997) outlined, momentum is measured as the *Raw Return* over the one year preceding the analytic period. The idiosyncratic risk is the variance of the residuals in the market model's expected returns for sixty months leading up to the day before the analytical period.

Furthermore, we include factor loadings from the Fama-French three-factor model plus a momentum factor (Eisfeldt & Papanikolaou, 2013; Fama & French, 1992), recalibrated annually based on data from the previous 60 months. Factor loadings from these four factors are incorporated in regression models linearly. We utilize industry dummy variables at the two-digit SIC level to address variations in OC investments across different sectors. Some models also include firm-fixed effects to control for unobserved firm-specific influences on the relationship between OC and crisis returns. To address autocorrelation in our panel data where error terms at different times may be correlated, we allow clustering at the firm level in all our regressions.[3] All variables are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers. Detailed definitions of these variables are provided in Appendix B.

3.7. Summary statistics

Table 1, Panels A and B present an overview of the variables along with their respective summary statistics for the periods of the GFC and COVID-19. Our primary variable, OC to total asset, during the periods of the GFC and COVID-19 exhibits mean (median) ratios of 0.640 (0.457) and 0.522 (0.353), respectively, with standard deviations of 0.626 and 0.527. For comparison, Eisfeldt and Papanikolaou (2013) report that the median OC to total assets is 1.09 for mid-level OC to total asset portfolio, and Li et al. (2018) demonstrate that the median ratio of OC to total assets is 0.69. During the GFC and COVID-19, the Raw Return exhibits mean values of 3.4 and −8.9 percentage points, respectively. However, Raw Return shows substantial negative values during the crisis periods, with means of −52.6 and −40.2 percentage points and values at the 25th percentile of −70.4 and −51.1 percentage points, respectively. The returns during the GFC and COVID-19 indicate significant concerns among investors and stakeholders about the viability and sustainability of the companies in which they had invested. Hence, these crisis periods provide an appropriate period for analyzing the contribution of OC, a potential driver of a company's sustainability and distinctive competitive advantage.

Table I, Panel C presents the correlation table of key variables used in the regression analysis during the GFC period of this study.[4] In our research, the core variable, OC, demonstrates a significant positive correlation with a firm's abnormal return ($p < 0.01$). This correlation suggests that OC positively impacts a firm's inherent stock performance. Furthermore, OC exhibited a positive correlation with raw return and abnormal return during crisis periods, indicating that OC positively impacts stock returns during the crisis. The company's size (measured by market capitalization) and profitability positively correlate with crisis raw return. In contrast, long-term debt and the book-to-market ratio negatively affect crisis raw return. The firm-level control variables and stock return metrics correlate with our expectations.

4. Results and analyses

4.1. OC and crisis returns during the GFC

We conduct multiple regression analyses to investigate the impact of a company's accumulated OC on stock returns during the GFC periods. Table 2 presents our baseline regression models during the GFC period. Column (1) features *Raw Return* as the dependent variable, while column (2) employs *Abnormal Return* as the dependent variable. Further, columns (3) and (4) incorporate controls for the firm's prior-year financial condition and other firm-specific characteristics. In columns (5) and (6), we apply the firm fixed effect as the Hausman test's result suggests the adoption of a firm fixed effects model ($\chi^2(13) = 91.51$, p-value < 0.01) (Hausman, 1978).

In all results from columns (1) to (6), the interaction term between OC and Crisis Returns shows a positive and significant correlation. These findings suggest that firms with higher levels of OC experienced less decline in stock returns during the crisis period. The sizes of coefficients in columns (5) and (6) suggest that in crisis periods, a one-standard-deviation increase in OC (0.626) is linked to 5.13 percentage points greater rise in *Raw Returns* and 5.07 percentage points greater increase in *Abnormal Returns* in the GFC period. Note that the coefficient of OC is also positively significant, which indicates that stock return performance during non-crisis periods is also associated with OC. To sum up, the findings in Table 2 suggest that when corporate sustainability becomes more important during economic crises, investors pay more attention to firms with higher levels of OC.

[3] To ensure robustness, we apply broader clustering at the industry and state levels to account for heteroscedasticity-corrected residuals. The results showed the same pattern as those obtained with firm-level clustering.

[4] The correlation table for the variables during the COVID-19 period will be provided upon request by the reader.

4.2. OC and crisis returns during the COVID-19

We employ another recent external shock, COVID-19, to corroborate our results in Table 2. Amidst the COVID-19 pandemic, the Standard & Poor's 500 reached its zenith on February 19, and in just one month, the stock index had plummeted by a staggering 35.4 percentage points. This shock is unforeseen and exogenous, and its rapid onset implies that firms had limited capacity to respond promptly to the unfolding crisis. Hence, as another period when a firm's sustainability and distinctive competitive advantage are in the spotlight, this provides an opportunity to evaluate the influence of OC on crisis returns.

Table 3 presents the findings of the COVID-19 period. Empirical patterns from the GFC are similarly found in the results of COVID-19. All columns from (1) to (6) in Table 3 show that during the COVID-19 period, OC's influence on stock returns is significantly greater compared to normal periods. In columns (5) and (6), incorporating firm fixed effects and control variables, results show that a one-standard-deviation increase in OC (0.527) is associated with a 2.42 percentage point greater increase in *Raw Returns* and a 2.58 percentage point greater increase in *Abnormal Returns*. We claim that OC functions as an immune system during exogenous economic shocks, instilling confidence in investors and mitigating damage to the company. Hence, firms with higher OC experience relatively less decline in stock prices during crisis periods.

4.3. Moderating role of CEO's background to OC and Raw Return

Even among companies with the same level of OC, sustainable performance can vary depending on their strategic decisions regarding resource utilization. Therefore, it is crucial to understand how key talents directly influence a company's resource utilization strategy and make important decisions about utilizing OC and other resources in response to dynamic market conditions during crises. We analyze the CEO as the most important decision-maker, categorizing them into generalist and specialist CEOs based on their general managerial ability. Specialist CEOs have annual GAI below the median, while generalist CEOs are at or above the median. We examine how CEO career backgrounds impact the relationship between OC and crisis period returns.

In Panel A of Table 4, we conduct a subsample regression[5] analysis on *Raw Returns* and *Abnormal Returns* to identify the effectiveness of OC utilization by CEO types to the firm's inherent OC during the GFC period. The analysis covers generalist CEOs in columns (1) and (2), while columns (3) and (4) depict specialist CEOs. Odd-numbered columns address raw returns as the dependent variable, while even-numbered columns present the results of analyzing abnormal returns. Generalist CEOs leveraged their diverse professional backgrounds during the economic crisis to strengthen the correlation between OC and stock returns, including *Raw* and *Abnormal Returns*. On the other hand, specialist CEOs do not significantly moderate the relationship between OC and crisis returns. This result remained consistent even when controlling firm characteristics and fixed effects. In columns (1) and (2), which incorporate control variables and firm fixed effects, generalist CEOs strengthen the relationship between OC and each of *Raw Return* and *Abnormal Return by* 4.70 and 3.94 percentage points for a one-standard-deviation increase in OC, respectively.

In Panel B, dedicated to analyzing the COVID-19 period, the results exhibit a similar pattern to Panel A, confirming that a generalist CEO enhances the correlation between OC and stock performance during the economic crisis. In contrast, Specialist CEOs do not significantly moderate the correlation between OC and crisis returns. In columns (1) and (2), wherein control variables and firm fixed effects are integrated, generalist CEOs fortify the relationship between OC and each of *Raw Return* and *Abnormal Return* by 3.43 and 4.32 percentage points for a one-standard-deviation increase in OC, respectively.

5. Robustness

5.1. Endogeneity

Our regression models may overlook endogenous effects of firm-level time-variant characteristics that exhibit correlations with OC and stock period returns. Thus, there is a potential risk that these omitted variables might influence or distort our findings (Zaefarian et al., 2017). The differences arising from omitted variables in the model may become part of the regression model's error term, potentially leading to endogeneity. In addition, simultaneity bias emerges when OC and crisis returns are jointly determined (Wooldridge, 2010, 2015). For instance, firms might choose investments in SG&A, considering future profitability and financial performance.

We attempt to alleviate endogeneity concerns using the Two-Stage Least Squares (2SLS) method with instrumental variables. Motivated by previous studies (Carlin et al., 2012; Hasan, 2018), the industry-level average OC based on four-digit SIC codes for each year is employed as our first instrumental variable. Within a specific industry, OC tends to exhibit similarities. Thus, a firm's OC strongly correlates with its industry-level OC. Carlin et al. (2012) argue that firms operating in rapidly evolving industries are less inclined to invest in OC, primarily due to the heightened risk of technological obsolescence. Importantly, the industry-level average OC is unlikely to influence the relationship between the firm's crisis returns, which implies that the necessary condition for the instrumental variable is deemed fulfilled.

[5] Our base model analyzes the interaction between OC and crisis returns, thus necessitating usage of a triple interaction analysis to examine the moderating effect of a generalist CEO. However, some research expresses skepticism about reliability of results from triple interaction analyses. The results are not reported in this paper, but if applied the triple interaction term shows a significant positive relationship for both raw returns and abnormal returns.

We measure state-level unemployment insurance (UI) benefits as our second instrumental variable. Eisfeldt and Papanikolaou (2013) argue that a key risk associated with firms' investments in OC is the potential loss of key talents. UI benefits are designed to mitigate the risk of income disruption during the job transition period, thereby increasing the risk of investments in OC due to key talents easily transitioning to new positions. Previous studies have observed a negative correlation between geographical mobility and the level of generosity of UI benefits (David et al., 2010; Hassler et al., 2005; Levhari & Weiss, 1974). Consequently, we anticipate firms in states offering more generous UI benefits to invest more in OC. Since UI benefits enhance the attractiveness of employees' outside options, companies should invest more in OC to prevent the outflow of key talents and accumulate human capital (Hasan & Uddin, 2022; Li et al., 2018). Furthermore, UI benefits are linked to OC but are anticipated to be unrelated to a firm's crisis return, satisfying the conditions as an instrumental variable.

The data on state-level UI benefits are from the U.S. Department of Labor's Database on Significant Provisions of State UI Laws. Our measure of state-level UI benefits is the natural logarithm of the product of the maximum benefit amount and the maximum duration allowed (Gao et al., 2021)). Consistent with previous research (e.g., Hasan et al. (2017); Hilary and Hui (2009)), we define a company's location as the place of its corporate headquarters. Pirinsky and Wang (2006) noted that this approach seems "reasonable given that corporate headquarters are close to corporate core business activities." Table 5 presents the results.

Column (1) in Panel A presents the first-stage regression results in the GFC period, examining the relationship between OC and two instrumental variables while controlling firm characteristics and fixed effects. We observe a significant and positive relationship between the OC and instrument variables. Our model passes Anderson's under-identification test ($\chi 2 = 3{,}109$, $p < 0.01$), indicating it is not under-identified. Furthermore, the Cragg-Donald Wald F-statistic substantially exceeds the Stock-Yogo critical value of 19.93, allowing us to reject the null hypothesis of weak instruments (Cragg & Donald, 1993; Stock & Yogo, 2005).

Columns (2) and (3) present the results of the *second-stage regression's Raw Return and Abnormal Retur*n, where we perform a regression analysis on the crisis return measures with the fitted value of OC. In both regressions, the p-values of Hansen's J over-identification test statistic are large, with values of 0.44 for *Raw Return* and 0.47 for *Abnormal Return*. These results indicate that the instrumental variables are significantly uncorrelated with the error term, suggesting their validity (Hansen, 1982). In line with the results presented in Tables 2 and 3, it is affirmed that the instrumented OC exhibits a positive and statistically significant relationship with both *Raw* and *Abnormal Return*s during times of crisis.

We employ the instrumental variable method Lewbel (2012) developed to alleviate endogeneity concerns further. In the first stage, this method does not estimate endogenous variables based on instrumental and exogenous variables. Instead, it modifies the regression model, considering the heteroskedasticity assumption within the model. This method has found application in recent research within corporate finance (e.g., Y. Chen et al. (2021); Hasan et al. (2021); Mavis et al. (2020)). Columns (4) to (5) report the results. We find that the instrumented OC using Lewbel's estimation method continues to be positively and significantly related to *Raw Return* and *Abnormal Return* in the crisis period.

In Panel B, which analyzed endogeneity during COVID-19, the first-stage tests indicated a significantly positive relationship between OC and instrumental variables. Subsequent analysis, conducting a second-stage regression and incorporating Lewbel's approach, confirmed a positive association between OC and stock returns during the crisis period. These findings were consistent with the patterns observed during the analysis of the GFC period.

5.2. OC and operational performance

We argue that the positive correlation between OC and stock returns during crises is due to operational performance-based sustainability rooted in efficient resource utilization capabilities. To examine whether OC affects operational performance during crises, we conducted an additional analysis using Return on Asset (ROA) and Return on Equity (ROE) as dependent variables. ROA is calculated by dividing a company's net income by total assets, while ROE is calculated by dividing net income by common equity total.

Panels A and B of Table 6 present the results of analyzing the impact of OC on ROA and ROE during the GFC and COVID-19 periods. The analysis shows a positive correlation between OC and operational performance indicators, ROA and ROE, during economic and non-crisis periods. These results were consistently observed during both the GFC and COVID-19 periods. These results support our assertion that OC leads to better operational performance during crises, enhancing investor confidence in sustainability and producing relatively higher crisis returns.

5.3. Industry adjusted OC and stock returns

The scale of SG&A expense investment can vary depending on each industry's characteristics; consequently, OC can differ across industries (Hasan, 2018; Li et al., 2018). We use industry-adjusted OC, measured by subtracting the OC's industry average at the SIC two-digit level in the corresponding year from the firm's OC, to enhance OC's comparability and prevent distorted interpretations. Panels A and B of Table 7 present the results. The analysis shows a positively significant coefficient of the interaction term between the industry-adjusted OC and Crisis, consistently observed for both the GFC and COVID-19.

6. Conclusion

This study examines the influence of OC, a key driver of sustainability and competitiveness for companies, on stock returns during the GFC. To bolster the robustness of our findings from the GFC, we also scrutinize the impact of the COVID-19 pandemic, reinforcing our hypothesis that OC is positively related to stock returns during economic crises. During the GFC and the COVID-19 period, a one-standard-deviation increase in OC is linked to a 5.13 percentage points and 2.42 percentage points increase in *Raw Return*s, respectively. These findings emphasize OC's role as a protective buffer during external economic shocks.

Furthermore, we find that generalist CEOs moderate the relationship between OC and crisis period returns. This observation highlights that OC's impact is amplified when CEO skillsets are well aligned with the utilization of OC. Specifically, during the GFC and the COVID-19 period, generalist CEOs strengthen the relationship between OC and *Raw Return by* 4.70 and 3.43 percentage points for a one-standard-deviation increase in OC, respectively. This result substantiates that generalist CEOs strategically leverage their diverse professional backgrounds during economic crises to fortify the correlation between OC and firm value.

One of our robustness tests suggests that one channel through which OC exerts its influence is sustained operational performance, measured by ROA and ROE. Consistent with our argument, firms with greater OC experience a smaller decline in profitability during crisis periods. However, OC may also influence crisis period returns through another channel: the firm's risk level. The relationship between OC and operational risk during crisis periods remains unexplored and presents a potential avenue for future research.

Our empirical evidence contributes to the literature by quantitatively confirming the relationship between OC and stock returns during economic crises. It validates prior studies' viewpoints and expands the research area to include economic crisis periods. Furthermore, we offer additional insights by examining how the impact of OC may vary based on decision-maker characteristics. This expansion shifts the research area from passively analyzing a fixed size of an effect of OC on firm value to a dynamic analysis of how performance can differ based on OC utilization in diverse environments and conditions. Our results also provide implications for stock investments and strategic management. They offer insights into projected stock returns linked to the firm's OC, facilitating informed investment decisions for stakeholders during crises. Additionally, our study suggests the utilization of OC as a newly discovered channel of influence on a CEO's general managerial ability.

CRediT authorship contribution statement

Chaeho Chase Lee: Writing – original draft, Validation, Software, Methodology, Investigation, Data curation, Conceptualization. **Erdal Atukeren:** Writing – review & editing, Supervision. **Hohyun Kim:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Funding acquisition, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. . Sample selection procedure

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	GFC	COVID-19
Number of firms in COMPUSTAT North America fundamentals Annual	5,423	5,496
Drop firms with		
SIC codes 6000–6999 (financial firms)	639	1,176
SIC codes 4900–4949 (utility firms)	11	19
SIC codes 8000 s and 9000 s (not-for-profit and governmental firms)	261	454
Missing OC data	20	34
Number of firms after all screens	4,492	3,813

Appendix B. . Variable definitions and sources

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Variables	Definition and Measurement	Source
Dependent Variable		
Daily return.	r – rf – 1where r equals the daily return based on the price or bid/ask Average (PRC) in the CRSP database, and the rf is the 1-month daily Treasury bill rate	CRSP
Raw Return	Firm's exponent of the sum of Daily returns during the testing period (9.15 ~ 3.9)	CRSP
Expected return	Market model estimated daily return over the 60-month ending in the day before the onset of the crisis and normal period Raw Return on the four factors (market, book-to-market, size, and momentum)	CRSP &Kenneth French's website [1)]
Abnormal Return	Raw Return – Expected return	CRSP
Main Independent Variable		
Organization capital(KO)	Initial stock: $OC_{i,0} = 0.3^{*}\ SG\&A_{i,1}$ / CPI Subsequent stock: $OC_{i,t} = (1 - \delta_{OC})\ OC_{i,} - 1 + (SG\&A_{i,t} / CPI_t)^{*}\ CPI_t$ represents the consumer price index* $\delta_{OC} = 15$ percentage points	COMPUSTAT
KO/AT (OC)	KO / AT	COMPUSTAT
Moderating Variable		
Generalist CEO	Dummy variables above the median of annual GAI	General Ability Index [2)]
Specialist CEO	Dummy variables below the median of annual GAI	General Ability Index
CEO's Tenure	YEAR − BECAMECEO(YEAR) + 1− If the CEO is re-employed as CEO in the same company, the prior CEO's tenure accumulated to the current position	EXECUCOMP
Control Variable: Accounting level		
Market Capitalization	Ln(PRCC_F * CSHO)	COMPUSTAT
Longterm_debt	DLTT / AT	COMPUSTAT
Shortterm_debt	DLC / AT	COMPUSTAT
Cash holding	CHECH / AT	COMPUSTAT
ROA	NI / AT	COMPUSTAT
Book-to-Market	CEQ / (PRCC_F * CSHO)	COMPUSTAT
Negative B/M	The dummy variable is set equal to 1 when the B/M is negative and zero otherwise.	COMPUSTAT
Control Variable: Market level		
Momentum	The exponent of the sum of daily returns over the one year ending in the day before the onset of the crisis and normal period Raw Return	CRSP
Idiosyncratic Risk	The variance of the residuals in the market model's expected return for sixty months leading up to the day before the onset of the crisis and normal period Raw Return	Kenneth French's website
Fama-FrenchFour Factor Loadings	Fama-French three-factor model plus the momentum factor loadings over the 60 months before the onset of the crisis and normal period Raw Return	Kenneth French's website

1) https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.
2) Following the Custódio et al. (2013).

Appendix C. .1. OC and crisis returns during the GFC (Crisis period ± 2 years)

In Appendix C.1, we render the results of a regression analysis that examines the relationship between OC and stock returns during the GFC period. The regression model is designed to be consistent with Table 2, while stock returns during non-crisis periods are calculated for two years before and after the GFC periods. All firm-specific variables were winsorized each year at the one percentage point level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicates significance at the 10, 5, and 1 percentage points, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
OC	0.014*	0.015*	0.017**	0.019**	0.043*	0.046**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.025)	(0.026)
Crisis	−0.041***	−0.043***	−0.047***	−0.049***	−0.044***	−0.045***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)
OC*Crisis	0.105***	0.099***	0.107***	0.101***	0.088***	0.087***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)
Market Cap.			0.002	0.006***	0.057***	0.063***
			(0.002)	(0.002)	(0.013)	(0.013)
Long-term debt			−0.015	−0.048**	−0.061	−0.063
			(0.022)	(0.022)	(0.057)	(0.057)
Short-term debt			−0.052	−0.090*	0.100	0.024
			(0.052)	(0.052)	(0.092)	(0.093)
Cash holdings			0.001	0.041	0.019	0.087
			(0.049)	(0.049)	(0.066)	(0.066)
Profitability			0.082***	0.119***	0.084**	0.143***
			(0.026)	(0.026)	(0.039)	(0.039)
Book-to-Market			−0.029***	−0.041***	−0.033***	−0.052***
			(0.003)	(0.003)	(0.005)	(0.005)
Negative B/M			0.136***	0.097**	0.235**	0.194**
			(0.047)	(0.047)	(0.092)	(0.092)
Momentum			−0.085***	−0.083***	−0.082***	−0.087***
			(0.007)	(0.007)	(0.008)	(0.008)
Idiosyncratic risk			−2.163***	−0.879***	−0.843**	0.122
			(0.185)	(0.185)	(0.343)	(0.346)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	9,753	9,753	9,234	9,234	9,234	9,234
Adj. R-Square	0.34	0.03	0.39	0.09	0.28	0.06

	Raw Returns						Abnormal Returns					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Generalist	Specialist	Generalist	Specialist	Generalist	Specialist	Generalist	Specialist	Generalist	Specialist	Generalist	Specialist
OC	0.024*	0.025*	0.026*	0.021	0.242***	0.171***	0.026*	0.021	0.029**	0.027*	0.211***	0.219***
	(0.014)	(0.014)	(0.014)	(0.015)	(0.043)	(0.061)	(0.015)	(0.015)	(0.016)	(0.016)	(0.047)	(0.067)
Crisis	−0.037*	−0.011	−0.039*	−0.027	−0.051**	−0.049**	−0.041*	−0.043*	−0.044*	−0.040*	−0.046*	−0.042
	(0.021)	(0.022)	(0.022)	(0.022)	(0.023)	(0.024)	(0.023)	(0.024)	(0.024)	(0.024)	(0.026)	(0.026)
OC*Crisis	0.072***	0.031	0.073***	0.026	0.053**	0.025	0.083***	0.023	0.086***	0.019	0.072**	0.022
	(0.024)	(0.027)	(0.024)	(0.027)	(0.026)	(0.029)	(0.027)	(0.029)	(0.026)	(0.030)	(0.028)	(0.032)
Market Cap.			−0.001	−0.005	0.097***	0.064**			−0.000	−0.005	0.108***	0.074***
			(0.004)	(0.004)	(0.025)	(0.026)			(0.004)	(0.005)	(0.027)	(0.028)
Long-term debt			−0.028	−0.024	−0.041	0.203*			−0.085**	−0.060	−0.091	0.166
			(0.037)	(0.039)	(0.099)	(0.112)			(0.041)	(0.042)	(0.108)	(0.123)
Short-term debt			−0.146	0.052	−0.193	0.454**			−0.269**	0.025	−0.398**	0.377*
			(0.096)	(0.107)	(0.158)	(0.191)			(0.105)	(0.115)	(0.173)	(0.210)
Cash holdings			0.103	−0.013	0.139	0.003			0.137	0.082	0.202	0.145
			(0.093)	(0.087)	(0.124)	(0.117)			(0.101)	(0.094)	(0.135)	(0.129)
Profitability			0.059	0.069	0.101	0.126*			0.129**	0.121**	0.142*	0.218***
			(0.050)	(0.052)	(0.068)	(0.076)			(0.055)	(0.056)	(0.075)	(0.083)
Book-to-Market			−0.023***	−0.032***	−0.016*	−0.032***			−0.039***	−0.053***	−0.035***	−0.059***
			(0.005)	(0.006)	(0.009)	(0.012)			(0.005)	(0.006)	(0.010)	(0.013)
Negative B/M			0.001	0.177*	−0.044	−0.022			0.021	0.127	0.032	−0.055
			(0.104)	(0.102)	(0.189)	(0.191)			(0.114)	(0.110)	(0.207)	(0.210)
Momentum			−0.097***	−0.063***	−0.103***	−0.051***			−0.095***	−0.084***	−0.111***	−0.089***
			(0.015)	(0.014)	(0.017)	(0.017)			(0.016)	(0.016)	(0.018)	(0.018)
Idiosyncratic risk			−2.267***	−1.781***	−1.628**	−0.280			−1.154***	−0.547	0.044	0.684
			(0.347)	(0.424)	(0.710)	(0.778)			(0.379)	(0.457)	(0.778)	(0.855)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes
N	2,524	2,716	2,448	2,635	2,448	2,635	2,524	2,716	2,448	2,635	2,448	2,635
Adj. R-Square	0.51	0.47	0.54	0.49	0.43	0.38	0.02	0.02	0.07	0.07	0.16	0.14

Appendix C. .2. Moderating role of CEO's background to OC and Raw Return during the GFC (Crisis period ± 2 years)

This table provides regression estimates of the moderating influence of generalist CEOs on the relationship between OC and Crisis Returns, including *Raw Return* and *Abnormal Return*, during the crisis period. The regression model is designed to be consistent with Table 5, while stock returns are calculated for two years before and after the GFC periods. All firm-specific variables were winsorized each year at the one percentage point level to eliminate outliers, and standard errors were clustered by firm and year. *, **, *** indicates significance at the 10, 5, and 1 percentage points, respectively.

Appendix D. .1. OC and crisis returns during the GFC – Excluding small-cap stocks

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Appendix E. .1 presents a regression analysis that examines the relationship between OC and stock returns during the GFC period. The regression model is designed to be consistent with Table 2 while including small-cap stocks with a market capitalization of less than $250 million. All firm-specific variables were winsorized each year at the one percent level to eliminate outliers, and standard errors were clustered by firm and year. *, **, * indicate significance at the 10 %, 5 %, and 1 % levels, respectively**

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	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
OC	0.015*	0.012*	0.014*	0.011	0.061***	0.068***
	(0.008)	(0.007)	(0.008)	(0.008)	(0.022)	(0.022)
Crisis	−0.029*	−0.018	−0.051***	−0.043***	−0.057***	−0.046***
	(0.015)	(0.014)	(0.015)	(0.014)	(0.015)	(0.015)
OC*Crisis	0.074***	0.062***	0.077***	0.067***	0.069***	0.065***
	(0.019)	(0.018)	(0.019)	(0.018)	(0.019)	(0.019)
Market Cap.			−0.007***	−0.004*	−0.053***	−0.037***
			(0.002)	(0.002)	(0.010)	(0.010)
Long-term debt			0.045**	0.002	−0.059	−0.086**
			(0.019)	(0.019)	(0.041)	(0.040)
Short-term debt			0.057	0.009	−0.018	−0.100
			(0.056)	(0.055)	(0.087)	(0.086)
Cash holdings			−0.024	0.002	0.016	0.053
			(0.052)	(0.051)	(0.062)	(0.061)
Profitability			−0.093**	−0.115***	−0.241***	−0.255***
			(0.037)	(0.036)	(0.062)	(0.061)
Book-to-Market			−0.037***	−0.049***	−0.080***	−0.095***
			(0.004)	(0.004)	(0.006)	(0.006)
Negative B/M			0.095**	0.088**	0.088	0.072
			(0.044)	(0.043)	(0.069)	(0.068)
Momentum			−0.054***	−0.053***	−0.057***	−0.057***
			(0.007)	(0.006)	(0.007)	(0.007)
Idiosyncratic risk			−2.193***	−1.009***	−2.882***	−1.434***
			(0.196)	(0.192)	(0.308)	(0.303)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	9,651	9,651	9,013	9,013	9,013	9,013
Adj. R-Square	0.31	0.03	0.36	0.06	0.38	0.07

Appendix D. .2. OC and crisis returns during the COVID-19 – Excluding small-cap stocks

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Appendix E. .2 presents a regression analysis examining the relationship between OC and stock returns during COVID-19. The regression model is designed to be consistent with Table 2 while including small-cap stocks with a market capitalization of less than $250 million. All firm-specific variables were winsorized each year at the one percent level to eliminate outliers, and standard errors were clustered by firm and year. *, **, * indicate significance at the 10 %, 5 %, and 1 % levels, respectively**

	(1)	(2)	(3)	(4)	(5)	(6)
	Raw Return	Abn. return	Raw Return	Abn. return	Raw Return	Abn. return
OC	0.009*	0.008	0.011*	0.012*	0.046*	0.052*
	(0.005)	(0.006)	(0.006)	(0.007)	(0.019)	(0.023)
Crisis	−0.205***	−0.229***	−0.210***	−0.237***	−0.201***	−0.220***
	(0.009)	(0.011)	(0.009)	(0.011)	(0.010)	(0.012)
OC*Crisis	0.058***	0.068***	0.051***	0.059***	0.049***	0.056***
	(0.011)	(0.013)	(0.011)	(0.013)	(0.011)	(0.014)
Market Cap.			0.006***	0.007***	0.023***	0.026***
			(0.001)	(0.001)	(0.006)	(0.007)
Long-term debt			−0.062***	−0.083***	−0.070**	−0.089**
			(0.009)	(0.010)	(0.024)	(0.029)
Short-term debt			−0.064*	−0.092*	−0.060	−0.109
			(0.030)	(0.036)	(0.053)	(0.064)
Cash holdings			0.001	−0.001	0.021	0.013
			(0.024)	(0.029)	(0.031)	(0.037)
Profitability			0.134***	0.178***	0.327***	0.404***
			(0.018)	(0.021)	(0.035)	(0.042)
Book-to-Market			−0.010***	−0.012***	−0.017***	−0.021***
			(0.002)	(0.002)	(0.005)	(0.006)
Negative B/M			−0.012	−0.008	−0.040	−0.046
			(0.015)	(0.018)	(0.029)	(0.034)
Momentum			−0.027***	−0.031***	−0.050***	−0.058***
			(0.004)	(0.005)	(0.005)	(0.006)
Idiosyncratic risk			1.243***	1.690***	3.935***	4.912***
			(0.239)	(0.286)	(0.472)	(0.564)
Four-Factor Load.	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	No	No
Firm fixed effects	No	No	No	No	Yes	Yes
N	6,097	6,097	6,053	6,053	6,053	6,053
Adj. R-Square	0.48	0.10	0.49	0.14	0.49	0.14

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