

Is ESG Investing Safe Haven during Times of Crises and Beyond? Evidence from China amid and after the Covid-19 Pandemic

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ARTICLE INFO

Received: 23 January 2022

Revised: 8 February 2022

Accepted: 22 March 2022

Online: 01 June 2022

To cite this paper:

Yuwen Dai (2022). Is ESG Investing Safe Haven during Times of Crisis and Beyond? Evidence from China amid and after the Covid-19 Pandemic. *Asian Journal of Economics and Finance*. 4(2), 163-177.

Abstract: In the literature on sustainable investing, most research studies assume normal market conditions. However, research is limited on the value of sustainable investments during and after distressed market conditions. Given the rapid evolution of the Covid-19 global pandemic and its impact on the economies around the world, our objective in this paper is to address the gap in the existing literature by examining the specific role of ESG investing in China amid and after the market-wide financial crisis in response to the Great Lockdown from the coronavirus outbreak. We contribute to the literature by answering two key research questions: (i) Can ESG investing in equity indexes outperform their market benchmarks (i.e., can ESG investing beat the market) in China during 'normal' times versus 'crisis' periods? (ii) Can investing in ESG equity indexes improve portfolio diversification during times of crises and beyond? From our study, we find that ESG investing in equity indexes has the potential to increase risk-adjusted returns during both normal and crisis periods for the case of China. Moreover, the role of ESG investing in portfolio diversification is strengthened in the post-crisis period. Our research findings draw implication on the value of ESG investing during and after distressed market conditions.

Keywords: ESG (environmental, social, and corporate governance); sustainable investing; portfolio management; China; the Covid-19 pandemic.

JEL classification: G11, Q56.

1. Introduction

Over the past three decades, ESG (environmental, social, and corporate governance) investing, which is also known as sustainable investing, has been attracting increased attention, both in academic research and in practice, as evident from a rapidly growing number of research studies and practitioner reports. In the literature on sustainable investing, most research studies assume normal market conditions. However, research is limited on the value of sustainable investments during and after distressed market conditions. Nevertheless, some insights have been gleaned from the 2007/08 Global Financial Crisis (GFC). For instance, Nofsinger and

Varma (2014) find that socially responsible funds outperform during periods of market crises. Cornett, Erhemjamts, and Tehranian (2016) show that the financial performance of US commercial banks is positively and significantly related to their corporate social responsibility (CSR) / ESG scores during the GFC period, which is evidence of a flight to quality. In Lins, Servaes, and Tamayo (2017, 2019), they find that firms with high ESG ratings have higher stock returns than other firms during the GFC period under study.

Since late 2019 / early 2020, the outbreak of the coronavirus has hit the global economy hard. On March 11, 2020, the World Health Organization (WHO) declared that the coronavirus disease 2019 (Covid-19) had become a global pandemic.¹ Given the rapid evolution of this health pandemic and its impact on the economies around the world, it is important to understand the specific role of ESG investing amid and after the market-wide financial crisis, which were triggered in response to the Great Lockdown (as coined by the IMF^{2,3}) due to the Covid-19.

Along this line of research, Khew, Lopez, Su, and Quek (2020) track the performance of ESG-focused investments across geographies and asset classes during the two significant crises – the GFC of 2008 and the ongoing Covid-19 pandemic, and they observe that ESG-focused equity investments were resilient through the crises. Albuquerque, Koskinen, Yang, and Zhang (2020) find empirical evidence on the resiliency of environmental and social stocks during the Covid-19 market crash. Rubbaniy, Khalid, Samitas, and Ali (2021) study four major ESG equity indexes from global and emerging markets, and they suggest the existence of safe-haven properties in ESG stocks during the Covid-19. Broadstock, Chan, Cheng, and Wang (2021) use a novel dataset of China's CSI 300 constituents and illustrate that the role of ESG performance is attenuated in normal times, with incremental importance during the Covid-19. Diaz, Ibrushi, and Zhao (2021) reconsider systematic factors and find the rising importance of ESG factor during the Covid-19.

In this paper, our objective is to better understand the value of ESG investing during and after distressed market conditions. To that end, we examine the specific role of ESG investing in China amid and after the Covid-19 pandemic. We follow the line of research by Schroder (2007), Sherwood and Pollard (2017), and Dai (2021) to focus on investing in ESG equity indexes. The rest of this paper is organized as follows. In *Section 2*, we contribute to the literature by addressing the key research questions on: Can ESG investing in equity indexes outperform their market benchmarks during 'normal' times versus 'crisis' periods? In *Section 3*, we answer the research question on: Can investing in ESG equity indexes

improve portfolio diversification during times of crises and beyond?. From our study, we find that ESG investing in equity indexes can increase risk-adjusted returns during both normal and crisis periods for the case of China. Moreover, the role of ESG investing in portfolio diversification is strengthened in the post-crisis period. Our research findings draw implication on the value of ESG investing during and after distressed market conditions. *Section 4* concludes.

2. Can ESG Investing Beat the Market?

Over the past decade, sustainable investing in China, which was primarily implemented by Chinese banks in extending credits at the outset, has been experiencing rapid development with the gradual integration of ESG investing as an important criterion into the practice of the Chinese capital markets. According to the latest *China Sustainable Investment Review* by China Social Investing Forum (CSIF 2020), the Chinese sustainable investment market has grown rapidly since the end of 2019, which has been driven by sustainable investment policies along with changes in economic and market conditions. The number of pan-ESG equity indexes have steadily increased. As of October 2020, there are 52 pan-ESG equity indexes tracking A shares that have been released on the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE). Among these 52 pan-ESG equity indexes, 15 indexes belong to the strategy type of “ESG Select” category, which applies a method that screens constituent stocks by using all of the three factors of E (environmental), S (social), and G (corporate governance).

In our study, we examine six ESG equity indexes from these 15 “ESG Select” indexes for China, which have available data. They are the SHSE Social Responsibility Index (000048.SH), the SZSE Corporate Social Responsibility Index (399341.SZ), the CNI-CBN-AEGON Industrial CSR Index (399369.SZ), the CCTV 50 Index (399550.SZ), the CCTV 50 CSR Index (399555.SZ), the CSI ECPI ESG China 100 Index (000846.CSI)

Table 1: ESG Select Equity Indexes in China

<i>Ticker</i>	<i>ESG Select Equity Index</i>	<i>Release</i>	<i>Benchmark Index</i>
000048.SH	SHSE Social Responsibility Index	2009-08-05	SHSE Composite Index
399341.SZ	SZSE Corporate Social Responsibility Index	2009-08-03	SZSE Component Total Return Index
399369.SZ	CNI-CBN-AEGON Industrial CSR Index	2009-11-04	CSI 300 Index
399550.SZ	CCTV 50 Index	2012-06-06	CSI 300 Index
399555.SZ	CCTV 50 CSR Index	2013-06-06	CSI 300 Index
000846.CSI	CSI ECPI ESG China 100 Index	2012-10-16	CSI 300 Index

Sources: Sustainable Stock Exchanges (SSE) Initiative’s database; China Securities Index (CSI) database.

(399555.SZ), and the CSI ECPI ESG China 100 Index (000846.CSI). These six ESG equity indexes represent different ESG screening procedures, which in turn leads to relatively general conclusions on the effects of ESG screening on portfolio performance.

In Table 1, we provide information on our ESG equity indexes, their release dates, and their relevant market benchmark indexes. The benchmarks are the SHSE Composite Index for the SHSE Social Responsibility Index, the SZSE Component Total Return Index for the SZSE Corporate Social Responsibility Index, and the CSI 300 Index for all the remaining ESG equity indexes. These benchmark indexes have been selected in such a way that the investment universe of the ESG equity indexes is well and closely approximated.

To understand the value of ESG investing during ‘normal’ times versus ‘crisis’ periods, we first define the periods of normal market conditions and distressed market conditions in our study. From the performance of the three major Chinese equity market benchmarks during the COVID-19 outbreak, we observe that despite the unfolding events prior to the lockdown of Wuhan on January 22, 2020, there were no initial market reactions in China. (See Figure 1.) But on February 3, 2020 when markets reopened after the Chinese Lunar New Year, there were sharp declines in the three benchmark indexes. On March 11, 2020, the WHO declared that COVID-19 had become a global pandemic. This in turn triggered the Great Lockdown in economic activities and caused unprecedented huge declines in equity markets around the world. See, for example, Liu, Choo, and Lee (2020); Phan and Narayan (2020); Xiong, Wu, Hou, and Zhang (2020);

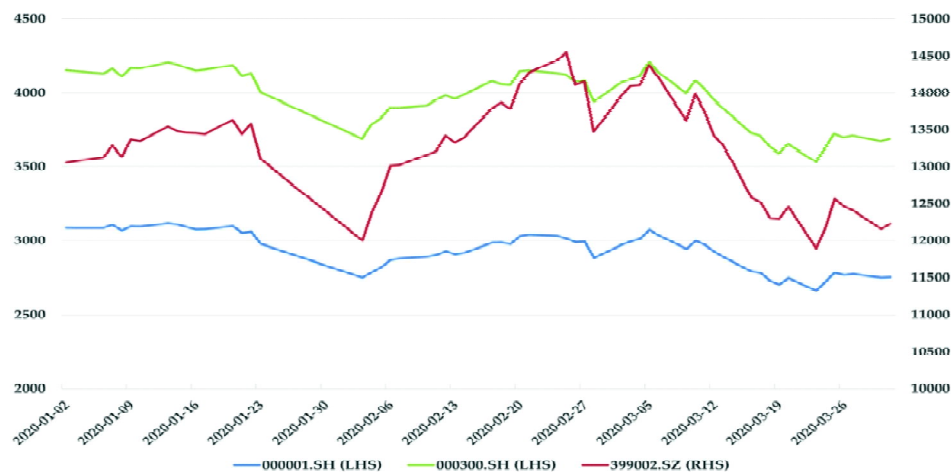


Figure 1: China's Equity Market Benchmark Indices during the COVID-19 outbreak in 2020Q1

Broadstock, Chan, Cheng, and Wang (2021); Chowdhury, Khan, and Dhar (2021); Umar, Rubbaniy, and Rizvi (2021).

In our study, we define the first ‘normal’ time period (that is, pre-crisis period) to be from January to December 2019 (1 year); we follow Broadstock, Chan, Cheng, and Wang (2021) to define the first ‘crisis’ period to be from January 22, 2020 to February 5, 2020 (5 trading days: 1/22, 1/23, 2/3, 2/4, 2/5) after the lockdown of Wuhan; and the second ‘crisis’ period to be from March 11 to 17, 2020 (5 trading days: 3/11, 3/12, 3/13, 3/16, 3/17) after the declaration of COVID-19 as a global pandemic by the WHO; and the post-crisis period to be from April 1, 2020 to March 31, 2021 (1 year). In Table 2, we summarize the information of these four time periods under study.

Table 2: ‘Normal’ and ‘Crisis’ Periods

Time Periods	Time Range	Time Length
pre-crisis period	January to December 2019	1 year
crisis period #1	January 22 to February 5, 2020	5 trading days 1/22, 1/23, 2/3, 2/4, 2/5
crisis period #2	March 11 to 17, 2020	5 trading days 3/11, 3/12, 3/13, 3/16, 3/17
post-crisis period	April 2020 to March 2021	1 year

In Figure 2, we present a graphical overview of the performance of these ESG equity indexes (in blue) vis-a-vis their relevant market benchmark indexes (in orange), for the time period between January 2019 and March. From the figure, we observe that during the pre-crisis period (January to December 2019), the ESG equity indexes 000048.SH and



Figure 2: China’s ESG Equity Index Performance vs. Benchmark Index Performance.

1. The first trading day of 2019 = January 2, 2019 = 100.

399341.SZ outperformed their parent indexes (000001.SH and 399002.SZ); the ESG indexes 399550.SZ and 399555.SZ tracked their benchmark (CSI 300) very closely; 399369.SZ and 000846.CSI underperformed their benchmark.

For the first crisis period (5 trading days between January 22 and February 5, 2020), we find that the ESG equity indexes 000048.SH, 399341.SZ and 399550.SZ slightly outperformed their benchmarks; 399369.SZ and 399555.SZ slightly underperformed their benchmark (CSI 300); and 000846.CSI significantly underperformed its benchmark. For the second crisis period (5 trading days between March 11 and March 17, 2020), we find that the ESG equity indexes 000048.SH, 399341.SZ, 399369.SZ, and 399550.SZ tracked their benchmarks very closely; 399555.SZ slightly underperformed its benchmark (CSI 300); and 000846.CSI significantly underperformed its benchmark. During the post-crisis period in our study (April 2020 to March 2021), it is observed that the ESG equity indexes 000048.SH and 399369.SZ first underperformed and then tracked their benchmarks closely; the ESG index 399341.SZ first tracked closely and then outperformed its benchmark; the ESG index 399550.SZ tracked its benchmark (CSI 300) quite closely; and the ESG indexes 399555.SZ and 000846.CSI greatly underperformed their benchmark in the post-crisis period.

In Khew, Lopez, Su, and Quek (2020), they observe that ESG-focused equity investments, as represented by MSCI AC Asia ESG Leaders Index and MSCI Emerging Markets ESG Leaders Index, performed better than their parent indexes (MSCI AC Asia Index and MSCI Emerging Markets Index) in the Covid-19 period. (See their Figure 1.) From our Figure 2, we find that for the case of China, the resilience of ESG-focused equity investment depends on the construction of the ESG equity index and the time period under study.

A relatively higher return could be the result of a relatively higher risk exposure, and a relatively lower return could be the result of a relatively lower risk exposure as observed in Figure 2. So we next apply the Sharpe ratio to compare the risk-adjusted returns of our ESG equity indexes during the four time periods under study. The Sharpe ratio measures the performance of an investment compared to a risk-free asset and adjusts for the total risk of the investment. It is calculated as the difference between the return of the ESG equity index and the risk-free return, divided by the standard deviation of the investment. In our calculation of the Sharpe ratio, we use the Shanghai Interbank Offered Rate (SHIBOR) to proxy the risk-free interest rate. The Sharpe ratio of each ESG equity index is then compared to that of its respective market benchmark index. In Table 3A, we report the results for the pre-crisis period, the first crisis period, the second crisis period,

and the post-crisis period. Based on the performance of risk-adjusted returns, we do find that some ESG equity indexes outperform their conventional market benchmarks, (as highlighted in blue in Table 3A).

Table 3A: Measures of Risk-Adjusted Returns

Ticker	Pre-crisis period		Crisis period #1		Crisis-period #2		Post-crisis period	
	Sharpe	Sharpe BM	Sharpe	Sharpe BM	Sharpe	Sharpe BM	Sharpe	Sharpe BM
000048.SH	0.0884	0.0826	-0.3908	-0.3959	-1.3627	-1.2891	0.0773	0.0871
399341.SZ	0.1379	0.1173	-0.2689	-0.2310	-1.6774	-1.1537	0.1130	0.1061
399369.SZ	0.1027	0.1122	-0.2903	-0.3220	-1.6371	-1.3101	0.1070	0.1047
399550.SZ	0.1148	0.1122	-0.2405	-0.3220	-1.4798	-1.3101	0.0961	0.1047
399555.SZ	0.1067	0.1122	-0.3234	-0.3220	-1.5032	-1.3101	0.1223	0.1047
000846.CSI	0.0916	0.1122	1.3002	-0.3220	-0.5883	-1.3101	0.0968	0.1047

1. BM stands for 'benchmark'.

In Table 3B and Table 3C, we provide the results on measures of risk-adjusted returns for $r[-1,1]$ and $r[-2,2]$, which refer to the cumulative raw returns (in percentage) over a time window of three trading days and five trading days, respectively. Again, we find that some ESG equity indexes outperform their market benchmarks, (as highlighted in blue in Tables 3B and 3C). Hence, we conclude that ESG investing can beat the market in China, under both normal market conditions and distressed market conditions. This answers our first research question.

Table 3B: Measures of Risk-Adjusted Returns, $r[-1,1]$

Ticker	Pre-crisis period		Crisis period #1		Crisis-period #2		Post-crisis period	
	Sharpe	Sharpe BM	Sharpe	Sharpe BM	Sharpe	Sharpe BM	Sharpe	Sharpe BM
000048.SH	0.1555	0.1409	-0.8289	-0.8380	-2.1427	-1.9200	0.1288	0.1424
399341.SZ	0.2531	0.2072	-0.6332	-0.5012	-2.1778	-2.1029	0.1871	0.1726
399369.SZ	0.1839	0.1982	-0.6687	-0.7009	-2.1103	-2.0557	0.1800	0.1709
399550.SZ	0.2090	0.1982	-0.5742	-0.7009	-1.9905	-2.0557	0.1621	0.1709
399555.SZ	0.1885	0.1982	-0.6896	-0.7009	-2.3751	-2.0557	0.2004	0.1709
000846.CSI	0.1588	0.1982	2.0887	-0.7009	-1.2161	-2.0557	0.1612	0.1709

Table 3C: Measures of Risk-Adjusted Returns, $r[-2,2]$.

Ticker	Pre-crisis period		Crisis period #1		Crisis-period #2		Post-crisis period	
	Sharpe	Sharpe BM	Sharpe	Sharpe BM	Sharpe	Sharpe BM	Sharpe	Sharpe BM
000048.SH	0.1937	0.1681	-2.3996	-2.3885	-4.3063	-4.3322	0.1645	0.1815
399341.SZ	0.3194	0.2579	-1.8368	-1.3869	-3.9902	-4.6531	0.2399	0.2212
399369.SZ	0.2233	0.2438	-1.9366	-1.9592	-4.1811	-4.5170	0.2334	0.2161
399550.SZ	0.2591	0.2438	-1.7536	-1.9592	-4.4965	-4.5170	0.2054	0.2161
399555.SZ	0.2356	0.2438	-1.9625	-1.9592	-4.7718	-4.5170	0.2533	0.2161
000846.CSI	0.1984	0.2438	0.7182	-1.9592	-1.0617	-4.5170	0.2077	0.2161

So can these ESG equity indexes be replicated by their parent benchmark indexes? If the answer is yes, then investing in the ESG equity index is equivalent to investing in its benchmark. If not, then investing in the ESG equity index is not equivalent to investing in its benchmark, and hence there exists the potential that ESG investing can beat the market. To address that, we follow Huberman and Kandel (1987) and apply spanning tests to investigate whether these ESG equity indexes can be replicated by their relevant market benchmarks.

In our regression-based tests, the dependent variable is the excess return of the ESG equity index ($r_{i,t}^{ESG}$), which is calculated as the difference between the rate of logarithm return of the ESG index and the SHIBOR. The independent variable is the excess return of the respective benchmark index ($r_{i,t}^{BM}$), which is calculated as the difference between the rate of logarithmic return of the benchmark index and the SHIBOR.

$$r_{i,t}^{ESG} = \alpha_i + \beta_i r_{i,t}^{BM} + \varepsilon_{i,t}$$

The parameter α_i is the Jensen (1968)'s alpha, which measures the extra return of the ESG equity index that is not explained by the risk exposure with respect to the benchmark index.

The parameter β_i is the estimated value for the correlation coefficient between $r_{i,t}^{ESG}$ and $r_{i,t}^{BM}$. It is interpreted as a measure of the relative risk of the ESG index in comparison to the benchmark index. As in the Capital Asset Pricing Model (CAPM), a beta coefficient $\beta_i > 1$ indicates that the risk of the ESG index is higher than that of its market benchmark; with a beta coefficient $\beta_i = 1$, the ESG index proxies the systemic risk as represented in its benchmark index; and a beta coefficient $\beta_i < 1$ indicates that the ESG index has a lower risk than its benchmark.

In the spanning test, we have the joint null hypothesis: $H_0 : (\alpha_i = \beta_i = 1)$. If the null hypothesis of spanning is not rejected, then the ESG equity index can be replicated by its market benchmark index. That is, investing in the benchmark is, on average, equivalent to investing in the ESG equity index, without differences in return and/or risk.

In Table 4, we summarize the results from our regression-based tests, with the results from the pre-crisis period in Table 4A, and the results from the post-crisis period in Table 4B. For the pre-crisis period, we find that the spanning test is rejected for the ESG equity indexes 399555.SZ and 000846.CSI. For the post-crisis period, the spanning test is rejected for 399341.SZ, 399550.SZ, 399555.SZ, and 000846.CSI. Hence, the two ESG indexes 399555.SZ and 000846.CSI cannot be replicated by their parent

benchmarks during both the pre-crisis and post-crisis periods; the ESG indexes 399341.SZ and 399550.SZ cannot be replicated by their benchmarks in the post-crisis period. Therefore, there exists the potential that investing in these ESG equity indexes can beat the market.

Table 4A: ESG Equity Index vs. Benchmark Performance: Spanning Tests, pre-crisis period

Dependent variable: return of ESG Equity Index - SHIBOR						
	000048.SH	399341.SZ	399369.SZ	399550.SZ	399555.SZ	000846.CSI
const	0.0933	-0.055	0.0177	-0.0189	-0.1422 ***	-0.4937 ***
p-value	0.1100	0.2610	0.6260	0.6250	0.0000	0.0000
Shanghai Composite Inde	1.0362 ***					
p-value	0.0000					
Shenzhen Component Total Return Index		0.9581 ***				
p-value		0.0000				
CSI 300 Index			1.0121 ***	0.9877 ***	0.9370 ***	0.7724 ***
p-value			0.0000	0.0000	0.0000	0.0000
Spanning Tests	not rejected	not rejected	not rejected	not rejected	rejected	rejected
Adjusted R-squared	0.8850	0.9110	0.9510	0.9420	0.9530	0.6040
Number of observations	243	243	243	243	243	243

Table 4B: ESG Equity Index vs. Benchmark Performance: Spanning Tests, post-crisis period

Dependent variable: return of ESG Equity Index - SHIBOR						
	000048.SH	399341.SZ	399369.SZ	399550.SZ	399555.SZ	000846.CSI
const	0.0198	-0.0828 *	-0.0448	-0.1737 ***	-0.1640 ***	-1.2466 ***
p-value	0.7230	0.0590	0.2770	0.0000	0.0000	0.0000
Shanghai Composite Inde	1.0087 ***					
p-value	0.0000					
Shenzhen Component Total Return Index		0.9376 ***				
p-value		0.0000				
CSI 300 Index			0.9651 ***	0.8975 ***	0.8874 ***	0.2006 ***
p-value			0.0000	0.0000	0.0000	0.0010
Spanning Tests	not rejected	rejected	not rejected	rejected	rejected	rejected
Adjusted R-squared	0.8490	0.9050	0.9120	0.9450	0.9200	0.0430
Number of observations	243	243	243	243	243	243

*, **, *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively.

3. Can ESG Investing Improve Portfolio Diversification?

In the previous section, we answer the first research question on whether ESG investing can beat the market, with the conclusion that for the case of China, ESG investing in equity indexes can increase risk-adjusted returns during both 'normal' times and 'crisis' periods. In this section, we address our second research question on whether investing in ESG equity indexes can improve portfolio diversification. Based on the modern portfolio theory by Markowitz (1952), an ESG-screened equity index is a subset of its parent

benchmark index, and hence it is impossible for an ESG equity index to be more diversified than its benchmark. In the literature, ESG investing has been under a certain level of scrutiny regarding its linkage with portfolio performance, with the controversial conclusion that the integration of ESG criteria in investment processes must worsen portfolio diversification (Rudd 1981). In response, Hoepner (2010) develops a simple theoretical model with three main drivers of portfolio diversification: (i) the number of stocks, (ii) the correlation of stocks, and (3) average specific risk of stocks. The model argues that whilst the inclusion of ESG criteria into investment processes could worsen portfolio diversification via the first and second drivers, it could improve portfolio diversification through a reduction in the third driver.

In our study, we first determine the co-movement similarity (i.e., correlation) of the returns of our ESG equity indexes across different time periods. For diversification purposes, we want the correlation of returns between the ESG equity indexes to be low. To identify the most similar ESG equity indexes, we use clustering and choose one ESG equity index from each cluster. We focus on hierarchical agglomerative clustering, which is an iterative procedure that is used to build a hierarchy of clusters. The algorithm creates immediate rounds of increasing (in 'agglomerative') size until a final cluster is reached. The process creates relationships among the rounds of clusters, as the word 'hierarchical' suggests. It has the advantage of allowing us to examine alternative segmentations of data of different granularity before deciding which one to use. Agglomerative clustering begins with each observation being treated as its own cluster. Then, the algorithm finds the two closest clusters, defined by some measure of distance (similarity), and combines them into one new larger cluster. This process is repeated iteratively until all observations are clumped into a single cluster.

To decide on the closest clusters for combining in the agglomerative process, an explicit definition for the distance between two clusters is required. We use the Euclidean norm to calculate the relative distances between the vectors of ESG equity indexes. The distance matrices are calculated using percentage changes, that is, the returns of the ESG equity indexes. The results are described using the distance matrices shown in Figure 3, with the resulting clusters shown in the dendrograms in Figure 4.

In Figure 4, the vertical distances connecting the various clusters represent the Euclidean distances between clusters. We find that the 'representative' ESG equity indexes are 000048.SH/399555.SZ, 399369.SZ/399550.SZ, 399341.SZ, and 000846.CSI during the pre-crisis period;

000048.SH/399555.SZ, 399341.SZ/399369.SZ, 399550.SZ, and 000846.CSI during the first crisis period; 399550.SZ/399555.SZ, 399341.SZ/399369.SZ, 000048.SH, and 000846.CSI during the second crisis period and the post-crisis period in our study.

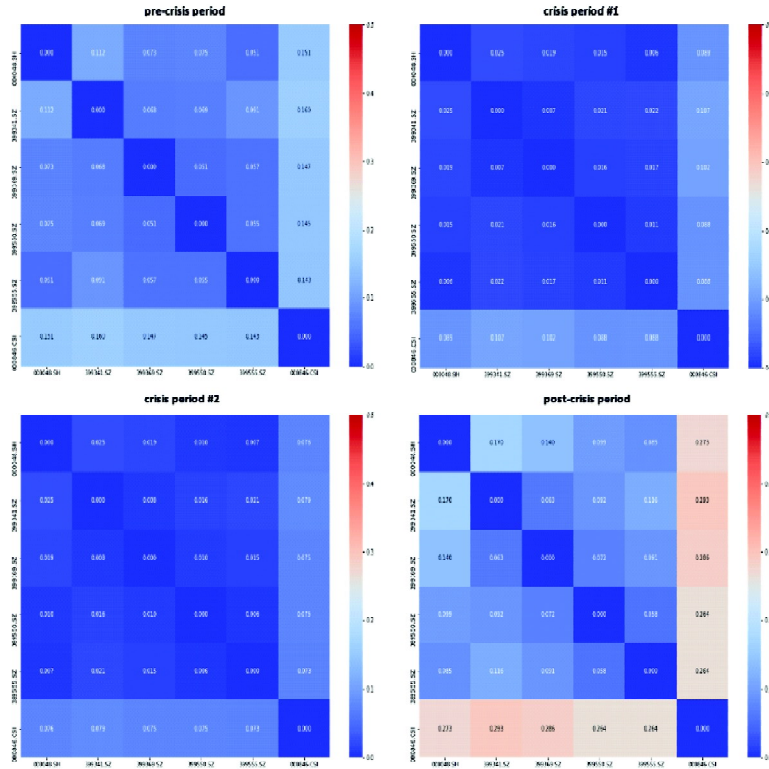


Figure 3: Distance Matrices for Hierarchical Agglomerative Clustering

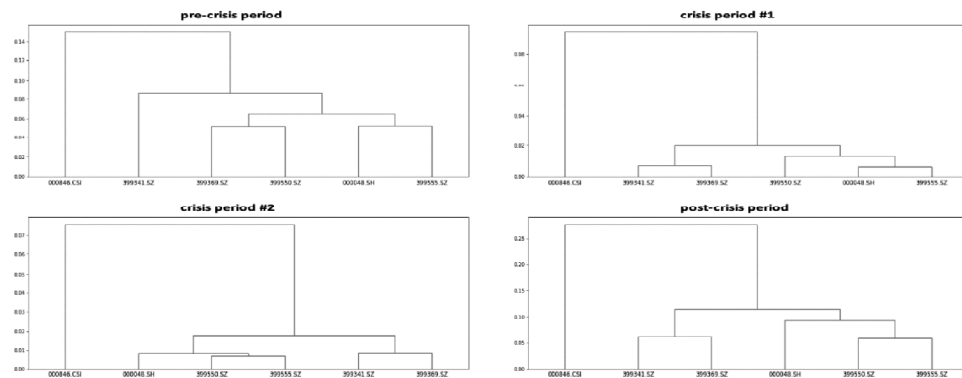


Figure 4: Hierarchical Agglomerative Clustering.

Next, we conduct Monte Carlo simulation to analyze the effect of including ESG equity indexes on portfolio diversification. The simulation results of our constructed portfolios are presented in Figure 5. Viewed horizontally, the results for each of the four time periods are shown in each row sequentially. Viewed vertically, the left column includes the baseline results for the three market benchmark indexes, the middle column for the simulation results with the three benchmarks and six ESG equity indexes, and the right column for the results with the three benchmarks and the four ‘representative’ ESG equity indexes (as identified in Figure 3 and Figure 4). In each panel figure, the horizontal axis measures the expected volatility, the vertical axis measures the expected return, and the color of the simulated portfolio proxies the risk-adjusted returns.

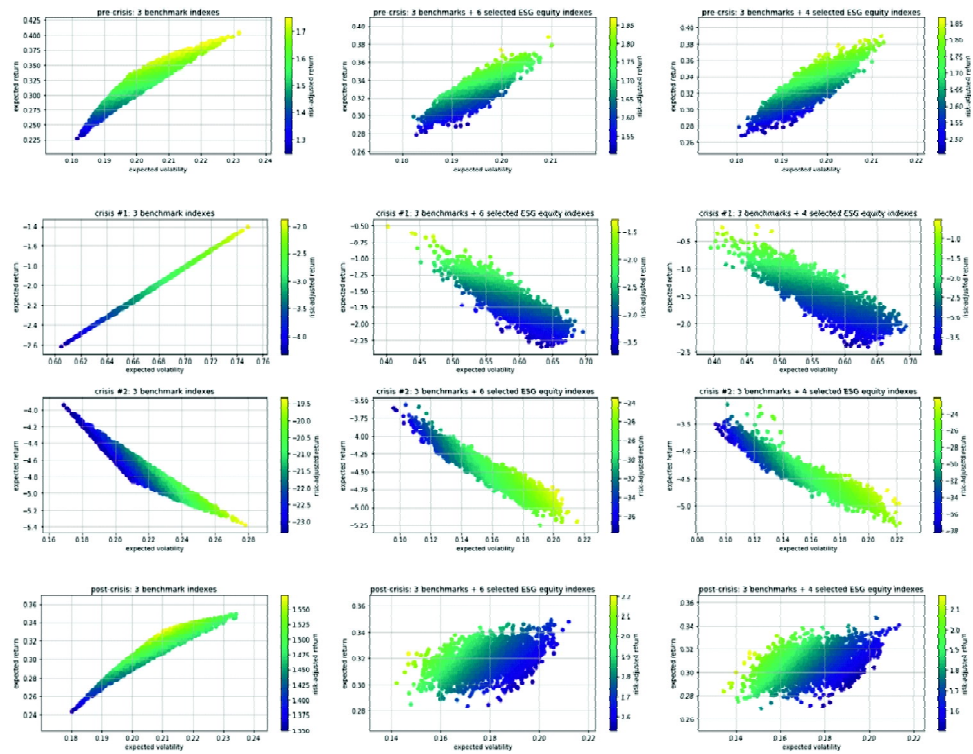


Figure 5: Portfolio Diversification - Monte Carlo Simulation

During the pre-crisis and the post-crisis periods under study, we find that consistent with our intuition, a higher expected return is associated with higher expected volatility. Portfolio diversification can be realized with the inclusion of the six ESG equity indexes into the baseline portfolio with three market benchmark indexes; and this diversification effect is

further achieved with the integration of the four ‘representative’ ESG equity indexes (as identified in Figure 3 and Figure 4). Compared with the pre-crisis period, the diversification effect of investing in ESG equity indexes is strengthened in the post-crisis period, with the highest risk-adjusted returns increased from 1.85 to 2.2.

During the two crisis periods in our study, we observe that counter to our economic intuition, higher risk (i.e., expected volatility) does not lead to higher expected return in times of crisis. Compared with the second crisis period, the diversification effect of ESG investing in equity indexes is enhanced during the coronavirus outbreak in China.

In summary, our simulation results show that for the case of China, investing in ESG equity indexes can improve portfolio diversification during both ‘normal’ times and ‘crisis’ periods. Compared with the pre-crisis period and the two crisis periods under study, this diversification effect of ESG investing in equity indexes is further strengthened in the post-crisis period.

4. Conclusion

Given the rapid evolution of the Covid-19 global pandemic and its impact on the economies around the world, our objective in this paper is to address the gap in the existing literature by examining the specific role of ESG investing in China amid and after the market-wide financial crisis in response to the Great Lockdown from the coronavirus outbreak. We contribute to the literature by answering two key research questions: (i) Can ESG investing in equity indexes outperform their market benchmarks (i.e., can ESG investing beat the market) in China during ‘normal’ times versus ‘crisis’ periods? (ii) Can investing in ESG equity indexes improve portfolio diversification during times of crises and beyond? From our study, we find that ESG investing in equity indexes can increase risk-adjusted returns during both normal and crisis periods for the case of China. Moreover, the role of ESG investing in portfolio diversification is strengthened in the post-crisis period. Our research findings draw implication on the value of ESG investing during and after distressed market conditions.

Notes

1. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>
2. <https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/>
3. <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/World-Economic-Outlook-April-2020-The-Great-Lockdown-49306>

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