



# RESEARCH PAPER

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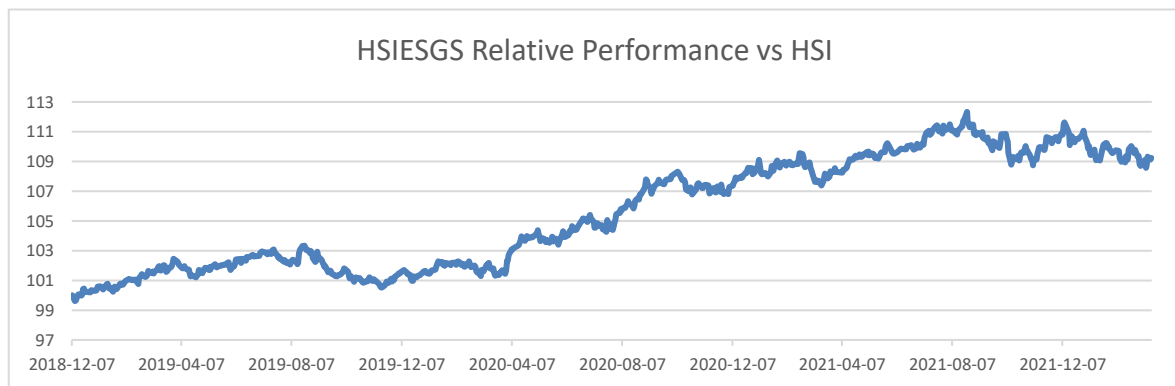
## Impact of Black Swan Events on ESG Relevance

### HSI ESG Enhanced Index Demonstrates Better Relative Strength Against Hang Seng Index Across Multiple Black Swan Events

The HSI ESG Enhanced Index ('HSIESGS') was launched on 29 November 2021 using Hang Seng Index ('HSI') as the underlying index. The HSIESGS<sup>1</sup> delivers a total active return of 7.19% over the HSI from 7 December 2018 to 15 March 2022 ('Back-testing Period') (Exhibit 1). In this paper, we analyse the active return of the HSIESGS by attributing returns into different groups according to ESG performance. We also examine if the HSIESGS outperformed the HSI during different events that occurred in the Back-testing Period, focusing particularly on the black swan events such as Hong Kong's five COVID-19 waves, the turmoil in the tech and education sectors in July 2021, and the ongoing geopolitical tension in Eastern Europe that began early this year.

Our research reveals that, in many cases of black swan or major disruptive events, the HSIESGS outperformed the HSI – the exceptions during the Back-testing Period being the first and fifth waves of COVID-19 in Hong Kong and the current geopolitical tension in Eastern Europe, during which a slight underperformance has been recorded. To this latter point, however, the magnitudes of the outperformances have been considerably larger than those of the underperformances. Finally, the attribution analysis reveals that ESG strategy does have a consistent positive impact on most of the studied black swan events. Our analysis suggests that the ESG strategy provided by the HSIESGS not only outperforms the benchmark over our Back-testing Period, but also provides sufficient cushion during short-term market shocks.

#### Exhibit 1: HSIESGS vs HSI Performance



Source: Hang Seng Indexes Company

Data period: 7 December 2018 to 15 March 2022

<sup>1</sup> Based on the methodology effective on 17<sup>th</sup> Jan 2022



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## Executive Summary

We define the black swan events with the respective dates in Exhibit 2. In Exhibit 3, we can see that the HSI ESGS outperformed the HSI by a wide margin over the entire Back-testing Period. The index also outperformed the HSI in many cases of black swan or major disruptive events – the exceptions during the Back-testing Period being the first and fifth waves of COVID-19 in Hong Kong as well as the geopolitical tension in Eastern Europe, during which a slight underperformance has been recorded. Particularly, it is worth noting that among all the black swan events, the magnitudes of outperformances in active return were significantly larger than those of the underperformances.

Furthermore, in order to analyse the ESG relevance on the performance, the active returns are further broken down using return attribution model<sup>2</sup>. In particular, each constituent is classified into different ESG Risk Rating Groups (referred to as ESG Group hereafter) according to its ESG Risk Rating Score based on Sustainalytics' methodology such that Group 0 denotes the best ESG performance while Group 4 denotes the worst ESG performance (Exhibit 4). Then, the active returns are attributed based on these ESG Groups. By decomposing the active returns using the return attribution model, the model shows that ESG strategy does have a positive impact on the performance of the HSI ESGS. Our findings suggest that an ESG overlay not only enhances performances but also provides sufficient cushion during short-term market shocks.

### Exhibit 2: Major Black Swan Events During Back-testing Period

	Black Swan Events	Start	End
COVID-19	First Wave	1/23/2020	3/3/2020
	Second Wave	3/16/2020	5/4/2020
	Third Wave	6/19/2020	9/25/2020
	Fourth Wave	11/18/2020	4/30/2021
	Fifth Wave	12/20/2021	3/15/2022
	Tech & Education Sector Turmoil in July 2021	7/2/2021	7/28/2021
	Geopolitical Tension in Eastern Europe	2/21/2022	3/15/2022

Source: Hang Seng Indexes Company

<sup>2</sup> Brinson-Fachler model



**Exhibit 3: Performance Metrics**

Periods/Events		Total Return		Annualised Volatility		Active Return
		HSI	HSIESGS	HSI	HSIESGS	
Back-testing Period		-22.18%	-14.99%	20.48%	20.96%	7.19%
COVID-19	First Wave	-5.49%	-6.12%	19.96%	20.46%	-0.63%
	Second Wave	2.07%	4.50%	37.90%	38.69%	2.42%
	Third Wave	-4.10%	-1.24%	19.00%	20.35%	2.86%
	Fourth Wave	8.73%	11.34%	19.22%	19.79%	2.61%
	Fifth Wave	-18.77%	-19.55%	27.38%	27.53%	-0.78%
Tech & Education Sectors Turmoil in July 2021		-9.66%	-8.43%	28.05%	28.73%	1.23%
Geopolitical Tension in Eastern Europe		-23.56%	-24.12%	32.38%	32.47%	-0.56%

Source: Hang Seng Indexes Company

Note: Please see Exhibit 2 for the period of each wave

**Exhibit 4: ESG Risk Rating Categories**

ESG Risk Rating Group		ESG Risk Rating Score
0	Negligible	0-9.99
1	Low	10-19.99
2	Medium	20-29.99
3	High	30-39.99
4	Severe	40-100

Source: Sustainalytics

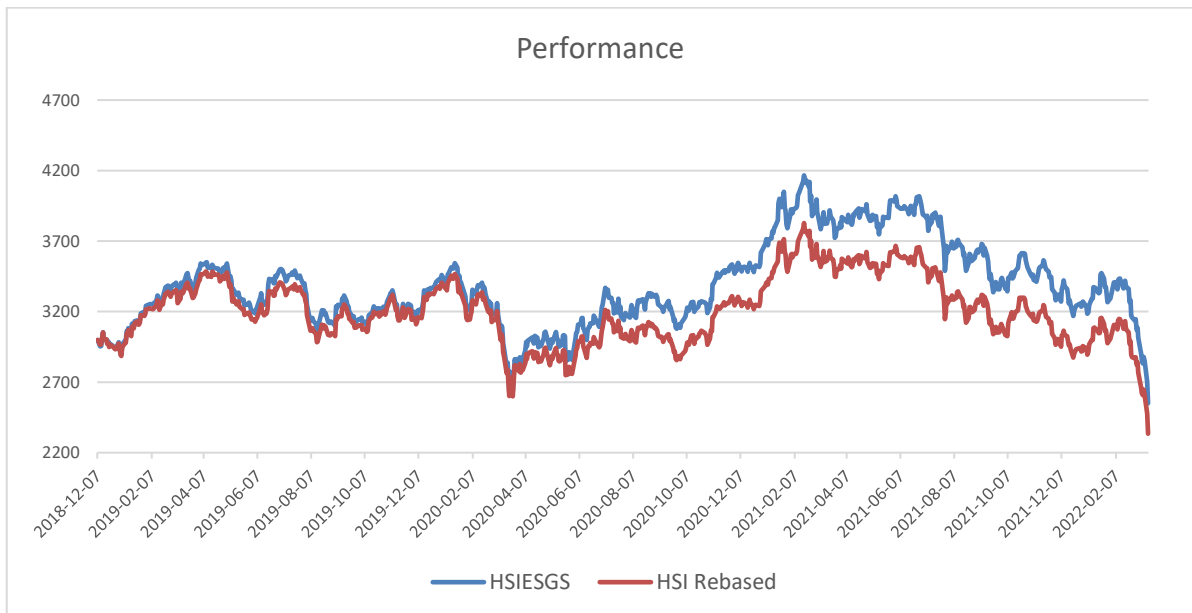


## Black Swan Events Analysis

### Back-testing Period (12/7/2018 to 3/15/2022)

The attribution analysis shows that ESG strategy provided a positive impact on the outperformance of the HSI ESGS during the entire Back-testing Period. First, the allocation effect from underweighting Group 4 and overweighting Group 1 lead to 1.04% and 3.45% excess return, respectively (Exhibit 6). Also, the selection effect from Group 2 and 4 bring about 4.79% and 4.10% excess return, respectively. The 4.79% selection effect in Group 2 mainly comes from tilting down tech stocks with below-average ESG performance (Exhibit 6 & 7). The 4.10% selection effect in Group 4 mainly comes from tilting down and excluding the worst ESG performance stocks (Exhibit 6 & 7).

### Exhibit 5: HSI ESGS vs HSI Performance



Source: Hang Seng Indexes Company

Data period: 7 December 2018 to 15 March 2022

### Exhibit 6: ESG Performance Attribution – Group Level

ESG Group	HSI ESGS Average Weight <sup>3</sup>	HSI Average Weight	Selection	Allocation	Interaction	Excess Return
1	45.74%	24.23%	-1.05%	3.45%	-1.00%	1.39%
2	48.11%	49.21%	4.79%	1.11%	-1.05%	4.85%
3	5.84%	18.72%	-0.56%	-0.03%	0.34%	-0.26%
4	0.31%	7.84%	4.10%	1.04%	-3.95%	1.20%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>7.28%</b>	<b>5.57%</b>	<b>-5.66%</b>	<b>7.19%</b>

Source: Hang Seng Indexes Company

Data period: 7 December 2018 to 15 March 2022

<sup>3</sup> Average weight refers to the sum of weights of each group/stock at all rebalancing dates divided by total number of rebalancing dates during the corresponding Back-testing Period.



Exhibit 7: ESG Performance Attribution – Stock Level (Snapshot)

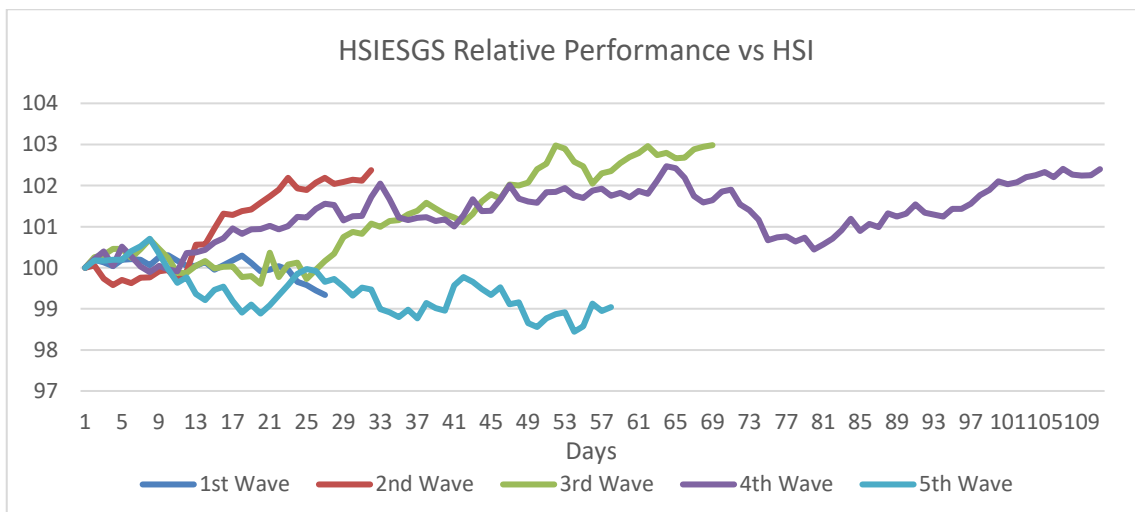
Stock	HSIESGS Average Weight	HSI Average Weight	Stock Selection	ESG Group
MEITUAN-W (3690)	1.59%	2.86%	2.08%	2
BABA-SW (9988)	1.97%	3.18%	3.38%	2
SINO BIOPHARM (1177)	0.09%	0.58%	1.43%	4
WH GROUP (0288)	0.04%	0.19%	0.95%	4
MENGNU DAIRY (2319)	0.07%	0.38%	0.66%	4
SINOPEC CORP (0386)	0.00%	1.10%	0.53%	4
CKH HOLDINGS (0001)	0.01%	1.29%	0.53%	4
CNOOC (0883)	0.03%	1.83%	0.37%	4
PETROCHINA (0857)	0.00%	0.77%	0.33%	4

Source: Hang Seng Indexes Company  
Data period: 7 December 2018 to 15 March 2022

### COVID-19

Despite many adverse market events happened during COVID-19, our ESG strategy sailed through the market turmoil as shown in Exhibit 8. The HSIESGS outperformed in three out of the five waves of COVID-19 in Hong Kong, averaging an outperformance of 2.6%, which is almost four times of the underperformance (-0.7%) over the Back-testing Period. Delving further into the source, albeit slight overall underperformances in the first and fifth waves, the outperformances from allocation effects are observed in almost all groups in the second, the third and the fourth wave (Exhibit 9). Our observation suggests that overweighting groups with better ESG performances and underweighting groups with worse ESG performances contributed positively to the overall return of HSIESGS. The findings also demonstrate that an ESG strategy can withstand market volatility more effectively.

Exhibit 8: HSIESGS vs HSI Relative Performance



Source: Hang Seng Indexes Company  
Note: Please see Exhibit 2 for the period of each wave



Exhibit 9: ESG Performance Attribution – Group Level

ESG Group	HSIESGS Average Weight	HSI Average Weight	Selection	Allocation	Interaction	Excess Return
<b>1st Wave</b>						
1	42.11%	22.76%	-0.11%	-0.93%	-0.09%	-1.13%
2	49.15%	46.16%	-0.55%	0.15%	-0.04%	-0.43%
3	8.28%	20.05%	-0.19%	0.27%	0.11%	0.19%
4	0.45%	11.03%	0.87%	0.72%	-0.84%	0.75%
<b>Total</b>	100.00%	100.00%	0.02%	0.20%	-0.85%	-0.63%
<b>2nd Wave</b>						
1	52.31%	26.42%	0.08%	0.95%	0.08%	1.10%
2	36.30%	33.55%	-0.36%	0.13%	-0.03%	-0.27%
3	10.88%	30.02%	-0.11%	1.53%	0.07%	1.49%
4	0.51%	10.01%	-0.07%	0.10%	0.07%	0.10%
<b>Total</b>	100.00%	100.00%	-0.47%	2.71%	0.18%	2.42%
<b>3rd Wave</b>						
1	36.66%	21.47%	-0.11%	1.84%	-0.07%	1.66%
2	58.43%	52.11%	-0.39%	-0.03%	-0.05%	-0.47%
3	4.59%	18.33%	-0.25%	1.10%	0.18%	1.03%
4	0.32%	8.09%	-0.31%	0.65%	0.30%	0.64%
<b>Total</b>	100.00%	100.00%	-1.06%	3.56%	0.36%	2.86%
<b>4th Wave</b>						
1	36.84%	21.68%	0.26%	1.04%	0.18%	1.47%
2	59.62%	57.19%	0.60%	0.07%	-0.03%	0.64%
3	3.22%	15.28%	-0.10%	0.38%	0.08%	0.36%
4	0.32%	5.85%	-0.84%	0.18%	0.80%	0.14%
<b>Total</b>	100.00%	100.00%	-0.08%	1.66%	1.03%	2.61%
<b>5th Wave</b>						
1	56.41%	28.01%	-0.46%	0.03%	-0.47%	-0.91%
2	40.42%	52.39%	2.32%	0.61%	-0.53%	2.41%
3	3.17%	16.35%	0.00%	-1.61%	0.00%	-1.62%
4	0.00%	3.25%	-0.06%	-0.66%	0.06%	-0.66%
<b>Total</b>	100.00%	100.00%	1.80%	-1.64%	-0.94%	-0.78%

Source: Hang Seng Indexes Company

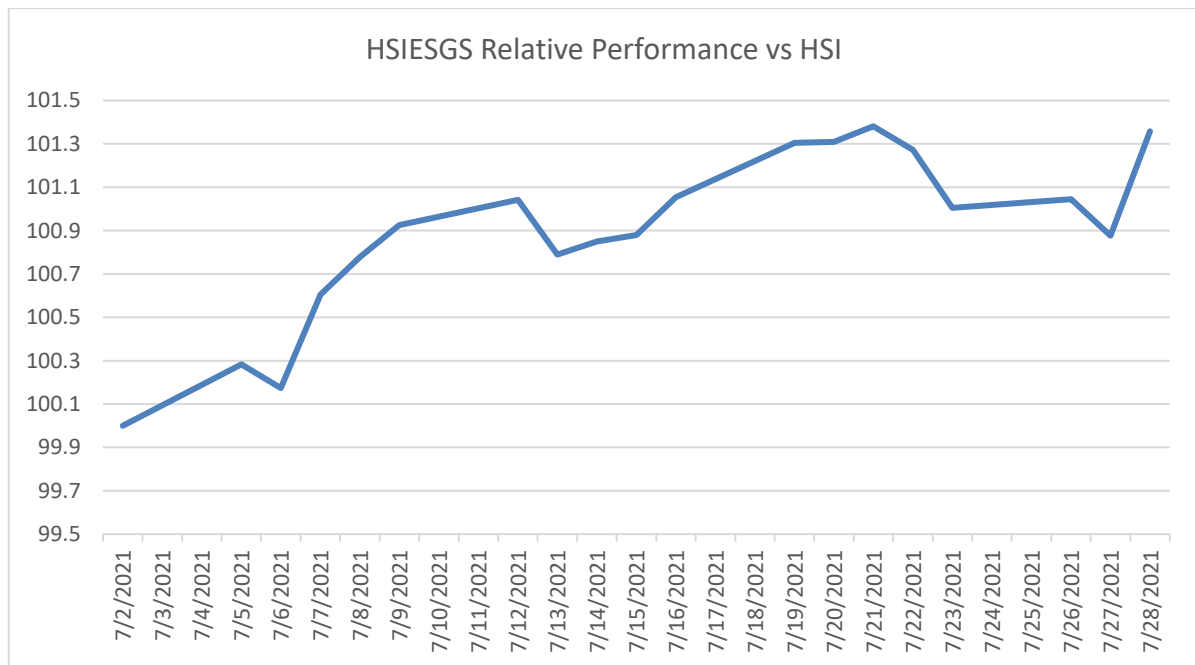
Note: Please see Exhibit 2 for the period of each wave



### Tech & Education Sector Turmoil in July 2021

Tech & Education sectors were hit hard during the month of July in 2021. Notwithstanding a market shrouded by negative sentiment, an ESG strategy again showed its resilience during market jitters. The HSIESGS outperformed the HSI by 1.23% during the Back-testing Period (Exhibit 10). The allocation effect in Group 1 and 2 lead to excess returns of 0.98% and 0.15%, respectively, albeit an underperformance observed in Group 3 (mostly banking stocks) as shown in Exhibit 11. The 1.03% stock selection excess return in Group 2 mostly comes from tilting down tech stocks with below-average ESG performance (Exhibit 11 & 12). Excluding stocks with the worst ESG performance contributes to stock selection excess return of 0.33% in Group 4 (Exhibit 11 & 12).

**Exhibit 10: HSIESGS vs HSI Relative Performance**



Source: Hang Seng Indexes Company  
Data period: 2 July 2021 to 28 July 2021

**Exhibit 11: ESG Performance Attribution – Group Level**

ESG Group	HSIESGS Average Weight	HSI Average Weight	Selection	Allocation	Interaction	Excess Return
1	41.06%	21.55%	-0.05%	0.98%	-0.05%	0.88%
2	55.87%	60.41%	1.03%	0.15%	-0.08%	1.11%
3	3.07%	14.39%	0.05%	-0.71%	-0.04%	-0.70%
4	0.00%	3.66%	0.33%	-0.06%	-0.33%	-0.06%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>1.37%</b>	<b>0.36%</b>	<b>-0.50%</b>	<b>1.23%</b>

Source: Hang Seng Indexes Company  
Data period: 2 July 2021 to 28 July 2021





Exhibit 12: ESG Performance Attribution – Stock Level (Snapshot)

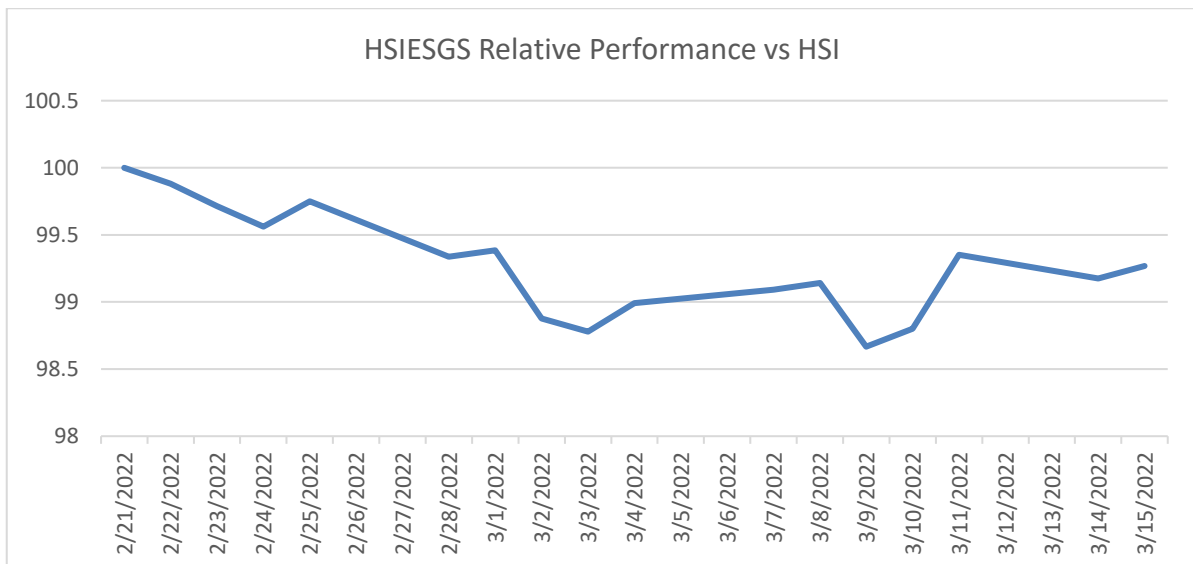
Stock	HSIESGS Average Weight	HSI Average Weight	Stock Selection	ESG Group
MEITUAN-W (3690)	5.92%	8.07%	0.59%	2
BABA-SW (9988)	4.59%	7.50%	0.39%	2
CITIC (0267)	0.00%	0.50%	0.01%	4
SINOPEC CORP (0386)	0.00%	0.76%	0.07%	4
CNOOC (0883)	0.00%	1.24%	0.19%	4
PETROCHINA (0857)	0.00%	0.64%	0.10%	4

Source: Hang Seng Indexes Company  
Data period: 2 July 2021 to 28 July 2021

### Geopolitical Tension in Eastern Europe

The geopolitical tension in Eastern Europe escalated in late February of 2022 and the ESG strategy underperformed slightly during this period. Looking at the allocation effect, underweighting of Group 3 (mostly banking stocks) leads to a -1.06% excess return (Exhibit 14). However, HSIESGS still manages to bring in excess returns of 0.15% and 0.40%, respectively by overweighting Group 1 and underweighting Group 2 (Exhibit 14). The strategy provided an excess return of 0.94% from stock selection, which primarily comes from tilting down tech stocks with below-average ESG performance (Exhibit 14 & 15).

Exhibit 13: HSIESGS vs HSI Relative Performance



Source: Hang Seng Indexes Company  
Data period: 21 February 2022 to 15 March 2022



Exhibit 14: ESG Performance Attribution – Group Level

ESG Group	HSIESGS Average Weight	HSI Average Weight	Selection	Allocation	Interaction	Excess Return
1	55.99%	27.93%	-0.20%	0.15%	-0.22%	-0.28%
2	40.76%	51.90%	0.94%	0.40%	-0.23%	1.11%
3	3.25%	16.72%	-0.07%	-1.06%	0.05%	-1.07%
4	0.00%	3.45%	0.40%	-0.32%	-0.40%	-0.32%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>1.07%</b>	<b>-0.83%</b>	<b>-0.80%</b>	<b>-0.56%</b>

Source: Hang Seng Indexes Company

Data period: 21 February 2022 to 15 March 2022

Exhibit 15: ESG Performance Attribution – Stock Level (Snapshot)

Stock	HSIESGS Average Weight	HSI Average Weight	Stock Selection	ESG Group
MEITUAN-W (3690)	2.75%	5.87%	0.84%	2
BABA-SW (9988)	2.57%	6.88%	1.27%	2

Source: Hang Seng Indexes Company

Data period: 21 February 2022 to 15 March 2022



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