

FACTOR INVESTING IN SINGAPORE

Exploring the Factor Exposure of Stocks in the Lion City

August 2020 | By Nicolas Rabener of FactorResearch

SUMMARY

- Singapore's stock market has unique features given its strong sector biases
- However, despite these, there were no structural factor exposures over time
- Like in other markets, investors can pursue factor investing to generate outperformance

INTRODUCTION

One of the stories of how Singapore received its name is about a Sumatran prince who came across a mythical beast called Janggi while hunting. Janggi acts as a guardian of gold mines and supposedly has lion-like features. From there to the name Singapore it is straight-forward: Singa is derived from the Sanskrit word for lion and Pura means city, given birth to Singapura, or the "Lion City".

The story is as mythical as the beast as there are no lions in South East Asia, only tigers, and Singapore is not known for gold mines. In fact, the city-state has so few natural resources that even water needs to be imported from nearby Malaysia.

Historically an abundance of natural resources was perceived as a blessing, however, economists' thinking has changed as it became clear that most countries rich in oil and minerals squander their wealth away. Nations with few natural riches had to work with the only resource at their hands: their people, and in the case of Singapore, also its favorable geographical position for trading.

The composition of Singapore's stock market reflects an industrious and trading-oriented country as it is dominated by financial, industrial, and real estate companies. These three sectors contribute more than 75% of the stocks of the FTSE Straits Times Index (STI), the benchmark index.

It is surprising that the real estate sector plays an outsized role in such a small country, but these are mostly companies that are listed in Singapore and manage assets elsewhere, highlighting a sophisticated financial market that is attractive for global companies seeking capital.

However, corporates that have revenues from diverse geographies and relatively small local footprints are complex animals. Analyzing stocks in the Singapore market is therefore frequently challenging. It is questionable if popular investment strategies like selecting cheap or quality stocks work as well as in other equity markets.

In this research note, we will analyze the performance of classic equity factors and explore the factor exposure of the most liquid stocks in the Singapore stock market.

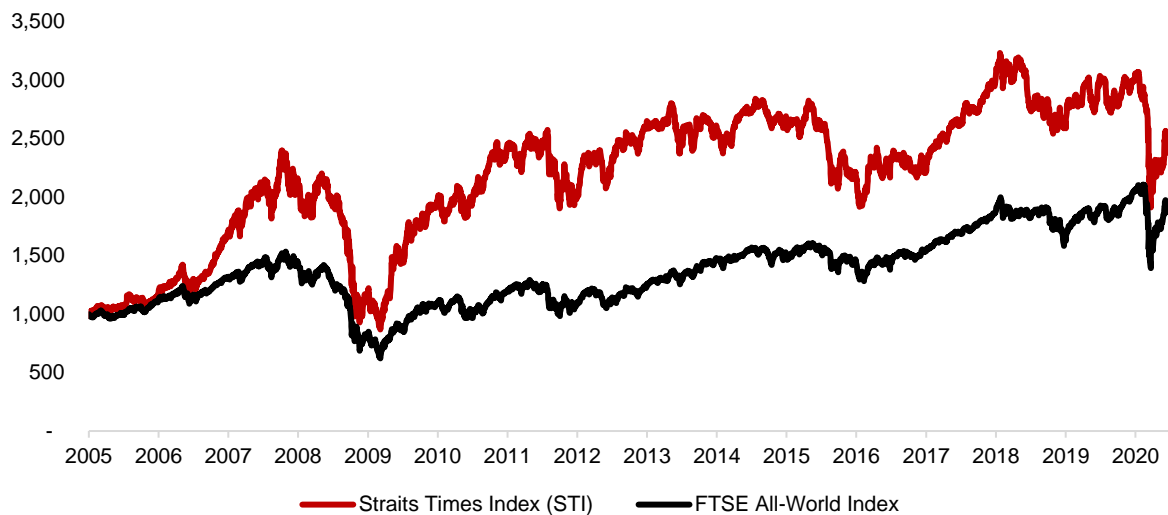
SNAPSHOT OF THE SINGAPORE STOCK MARKET

On a first glance, global investors might overlook Singapore given a population of less than 6 million, compared to more than a billion people in China and India as well as close to 300 million in Indonesia. However, more than 40% of the total market capitalization of companies listed in Singapore are foreign

stocks, which provides investors with exposure to the country as well as to the region. Given the status of a developed nation, it offers an attractive way of accessing the emerging Asia growth story.

Singapore is deeply integrated into the global economy given its position as one of the largest trading hubs in Asia. It is therefore not surprising that the performance of STI has been comparable to that of the FTSE All-World index in the 15 years from 2005 to 2020.

Straits Times Index (STI) vs FTSE All-World Index: Performance



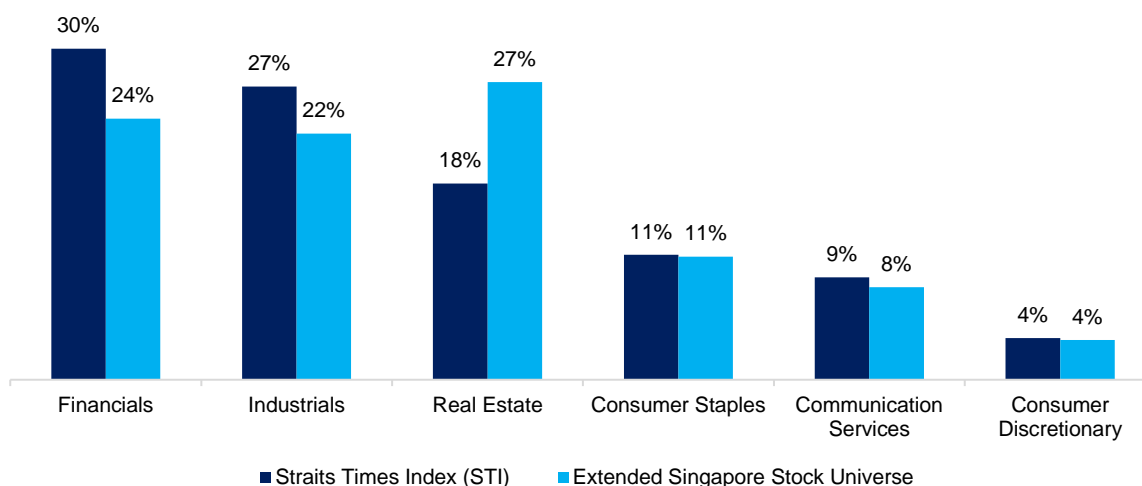
Source: FactorResearch

The STI has been more volatile than the FTSE All-World index, which is explained by the STI being comprised of only 30 stocks, essentially representing a highly concentrated portfolio. Furthermore, the index exhibits significant sector biases that reflect the unique nature of Singapore's economy.

However, in order to analyze the performance of equity factors in Singapore, we need to create diversified portfolios. Factor investing represents a systematic approach to generating outperformance, where minimizing individual firm-risk is critical.

We, therefore, define our universe of stocks in the Singapore market as the approximately 120 most liquid stocks traded on the Singapore Exchange, which increases the cumulative market capitalization from S\$456 billion to S\$578 billion compared to the STI. The exposure to the financial sector is reduced, although real estate stocks gain in prominence.

STI and Extended Singapore Stock Universe: Breakdown by Sectors (2020)



Source: FactorResearch. Only sectors with >4% contribution.

The breakdown highlights that these seven sectors dominate the stock market in Singapore in terms of liquidity over sectors like technology, utilities, health care, energy, or materials.

PERFORMANCE OF CLASSIC EQUITY FACTORS IN SINGAPORE

Defining Factors

Next, we analyze the performance of classic equity factors in Singapore, which is derived from beta-neutral long-short portfolios comprised of stocks from the extended stock universe.

We focus on seven factors, but it is worth highlighting that only five of those, namely Value, Size, Momentum, Low Volatility, and Quality, enjoy broad support from the research community. There is little empirical evidence that the Growth factor generates excess returns and Dividend Yield can be viewed as a subset of Value. However, both factors are widely followed investment styles, which warrants their inclusion in this analysis.

We utilize factor definitions that are in line with academic and industry standards when ranking stocks. Specifically, these are as follows:

Factor Definitions		
Factor	Metrics for Stock Selection	High Factor Exposure
Value	An equal-weight combination of price-to-book and price-to-earnings multiples	Cheap valuation
Size	Current market capitalization	Low market capitalization
Momentum	Last 12-months share price performance, excluding the most recent month	High performance
Low Volatility	Share price volatility over the last 12-months	Low volatility
Quality	An equal-weight combination of return-on-equity and debt-over-equity	High quality

Growth	An equal-weight combination of the 3-year sales-per-share and earnings-per-share growth	High growth
Dividend Yield	Current dividend yield	High dividend yield

Source: FactorResearch

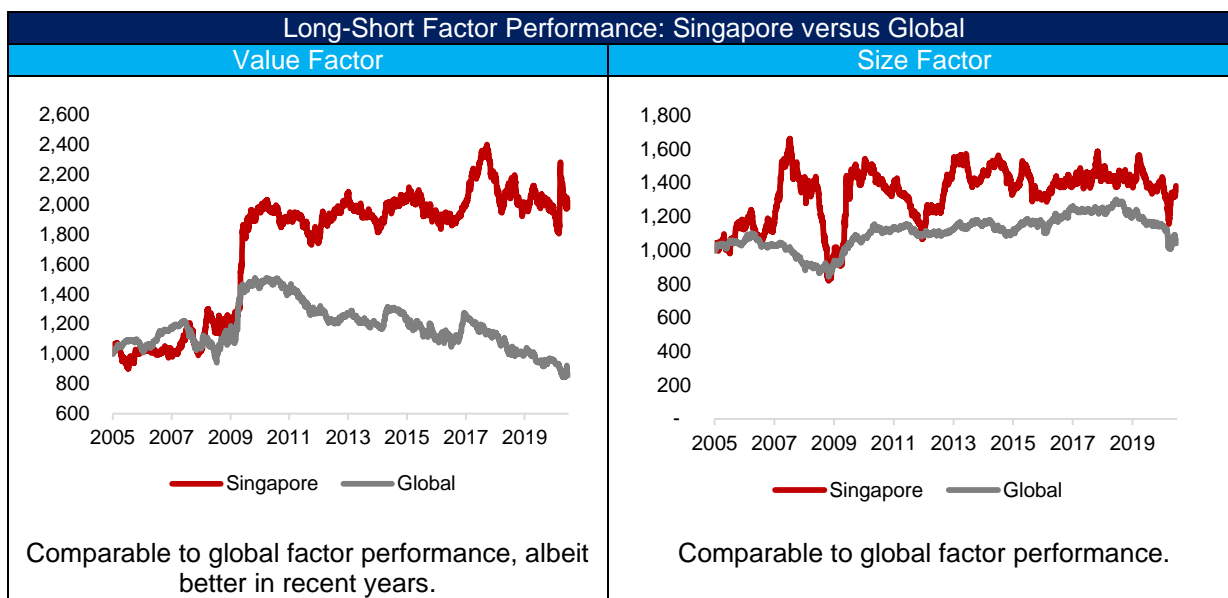
All factor portfolios are created by selecting the top and bottom 30% of stocks in the Singapore market and 20% in other markets ranked by each factor definition. Beta-neutrality is achieved by maintaining a beta of one in the long and short portfolios of each factor. The performance is therefore uncorrelated to the market and represents excess returns. We assume costs of 10 basis points per transaction and portfolios are rebalanced each month.

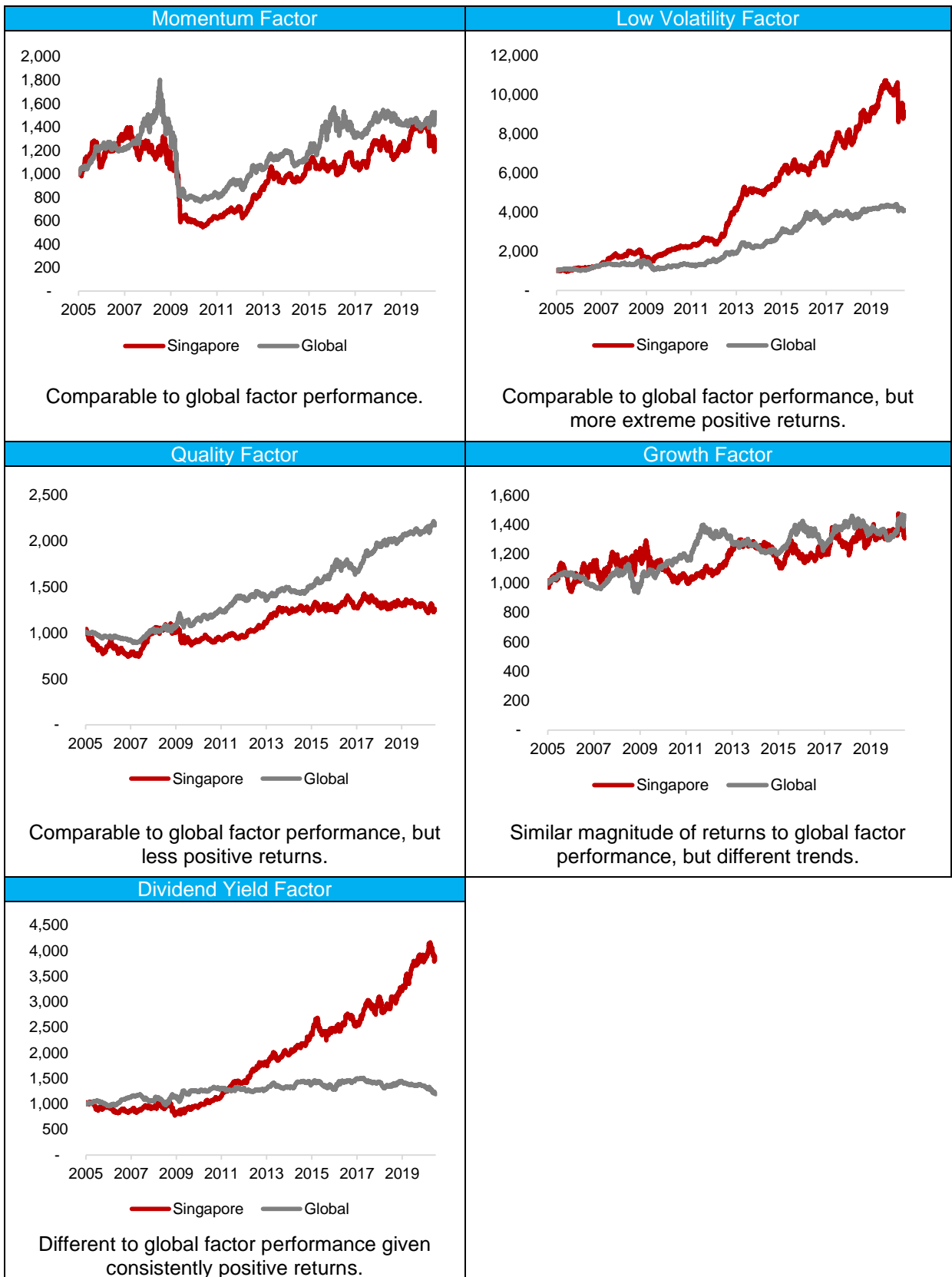
The analysis period covers 15 years from 2005 to 2020, which includes a multi-year bull market and two major stock market crashes, i.e. the global financial crisis in 2008 and the COVID-19 crisis in 2020. As benchmarks, we selected similarly constructed global long-short beta-neutral factors, which use stocks from the US, Europe, and developed Asian markets. The factor portfolios are created in each market and then aggregated by weighting them according to the market capitalizations.

Factor Performance

The analysis highlights that broadly speaking the performance of the long-short equity factors in Singapore mirrored the performance of global factors, which indicates common returns drivers. These results are not particularly surprising given that other researchers have found that factor investing does not only generate positive excess returns across various stock markets, but also in asset classes like fixed income, currencies, and commodities.

The returns of factors in Singapore were more volatile and more extreme in magnitude, which is explained by more concentrated portfolios with fewer stocks.





Source: FactorResearch

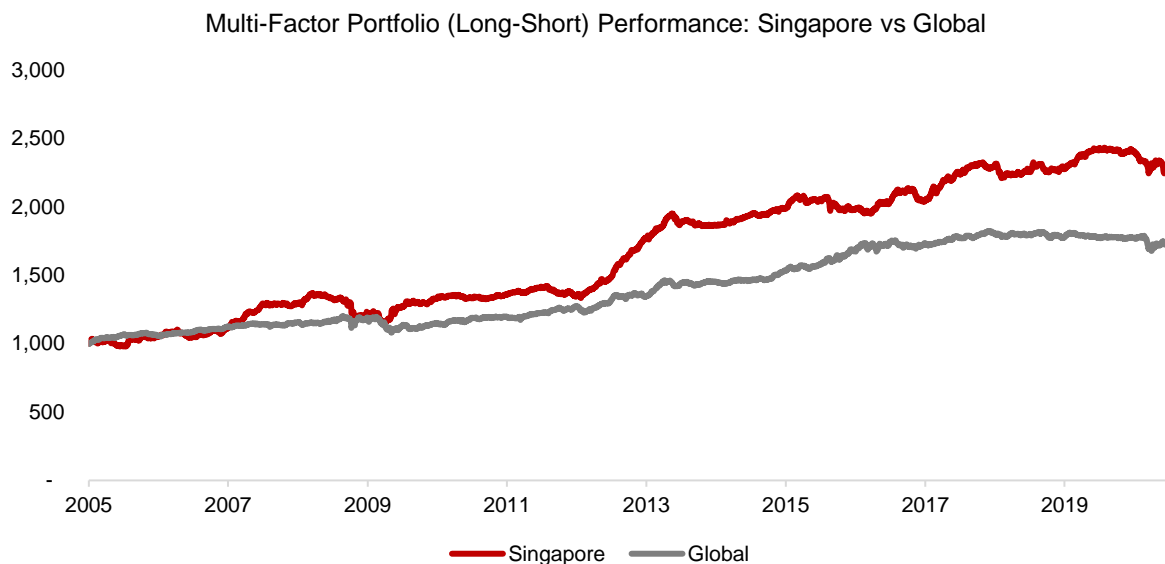
Multi-Factor Investing

These results highlight that factors behave quite differently across time and are as cyclical as equity markets. They experience long as well as aggressive up- and downward trends.

Intuitively investors are likely to be intrigued by the best-performing factors, which were Low Volatility and Dividend Yield in Singapore in the period from 2005 to 2015. However, performance chasing is risky and single factors can have extensive drawdowns. For example, the Momentum factor experienced a drawdown of more than 50% in 2009 when stock markets recovered and previously underperforming stocks like banks significantly outperformed winners such as healthcare stocks.

Given this, it is intuitive to combine factors into a multi-factor portfolio. Naturally, the question is which factors should be selected and how should these be weighted. A simplistic approach would be to equal weight the factors supported by academic research, which are Value, Size, Momentum, Low Volatility, and Quality.

We simulate the performance of such a multi-factor portfolio in Singapore and globally, which highlights relatively consistent excess returns with limited drawdowns over the last 15 years. The key difference is that factor investing in Singapore continued to generate positive excess returns since 2016 while a global multi-factor portfolio was essentially flat.



Source: FactorResearch

The mediocre performance of global multi-factor investing in recent years has been discussed intensely by market participants and researchers, but there is no consensus on the cause. Investors frequently question if the flows into risk premia and smart beta have caused certain factors to be crowded, but the data does not support it.

For example, the Value factor has performed poorly since 2010, but is more likely uncrowded than crowded based on fundamental valuation metrics as cheap stocks are trading at the widest spreads compared to expensive stocks since the tech bubble in 2000.

FACTOR EXPOSURE ANALYSIS OF THE MOST LIQUID STOCKS IN SINGAPORE

Factor Allocation Models

Factor investing can be pursued strategically or tactically. The former comprises allocating capital to a single or multi-factor portfolio with regular, but infrequent rebalancing. Allocations to factors within a multi-factor portfolio are typically equal- or risk-weighted.

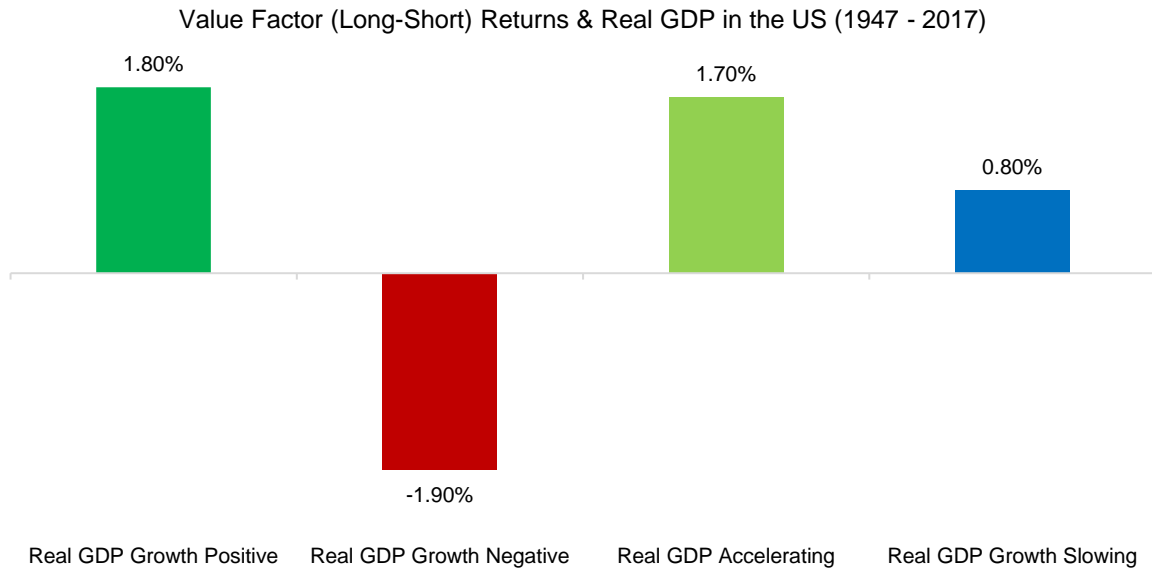
Allocating tactically represents a more dynamic approach to factor investing, where allocations change frequently based on discretionary or systematic signals. Academic research indicates that factors perform differently across the various economic regime and investors can adjust their allocations based on their perception of the outlook for the local or global economy, as highlighted by the following framework.

Economic Cycle			
Slowdown	Recession	Recovery	Growth
Momentum	Low Volatility	Value	Momentum
Quality	Quality	Dividend Yield	Value
Low Volatility	Value	Size	Size

Source: FactorResearch

We can highlight the factor performance during the economic cycle by studying the Value factor in the US, where long-term data is available. We distinguish between positive and negative GDP growth as well as between accelerating and decelerating growth, which is defined as the last quarter divided by the average growth of the previous four quarters.

The analysis highlights that the returns of the Value factor were highly dependent on the economic regime. Specifically, the performance was positive when real GDP was positive and negative when the economy was in a recession. Furthermore, the return was significantly higher when economic growth was accelerating compared to slowing down. Given this, some investors may seek rather tactical than strategic exposure to factors.



Source: Federal Reserve Bank of St. Louis, Kenneth R. French data library, FactorResearch

Stocks in the Singapore Market with Most Positive & Negative Factor Exposure

Investors that want to express their views on the economy, can accordingly select portfolios of stocks that offer high exposure to a certain factor and potentially allows investors to generate substantial outperformance.

The two methodologies for determining the factor exposure of a stock are top-down or bottom-up analysis. The top-down approach measures the factor exposure via a regression using factor returns, which results in the betas to each factor. In contrast, the bottom-up analysis measures the rank of each stock using the factor definition relative to all other stocks in the universe.

Naturally, both methodologies are related as the bottom-up factor rankings are used to create the factor portfolios and returns. However, both have advantages and disadvantages that determine their application.

The bottom-up analysis is arguably more precise and useful when determining the current factor exposure of a portfolio. The tables below show the factor exposure of the approximately 120 most liquid stocks in the Singapore market. For each factor, the top and bottom 10 stocks are listed.

Value Factor

Long Portfolio: Cheap Stocks				Short Portfolio: Expensive Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	YNLG.SI	Z25	Yanlord Land	THOS.SI	A50	Thomson Medical
2	HPHT.SI	NS8U	HPH Trust	SHEN.SI	OV8	Sheng Siong Group
3	CEWL.SI	U9E	China Everbright	CREA.SI	C76	Creative Technology
4	HONG.SI	H30	Hong Fok	KEPE.SI	AJBU	Keppel DC REIT
5	OVES.SI	LJ3	OUE	KEPL.SI	A7RU	Keppel Infrastructure
6	GUOC.SI	F17	GuocoLand	SGXL.SI	S68	SGX
7	FRPL.SI	TQ5	Frasers Property	ELIE.SI	MXNU	Elite Commercial
8	YAZG.SI	BS6	YZJ Shipbuilding	RAFG.SI	BSL	Raffles Medical
9	CHSN.SI	QES	China Sunshine	STEL.SI	Z74	Singtel
10	GAGR.SI	E5H	Golden Agri-Resources	DAIR.SI	D01	Dairy Farm

Size Factor

Long Portfolio: Small Stocks				Short Portfolio: Large Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	APAC.SI	CLN	APAC Realty	DBSM.SI	D05	DBS Group
2	SUND.SI	BHQ	Sunningdale Tech	JARD.SI	J36	Jardine Matheson
3	PROP.SI	OYY	PropNex	STEL.SI	Z74	Singtel
4	CSES.SI	544	CSE Global	OCBC.SI	O39	OCBC Bank
5	CREA.SI	C76	Creative Technology	UOBH.SI	U11	UOB
6	ASIA.SI	S7OU	Asian Pay Television	JSH.SI	J37	Jardine Strategic
7	VLUE.SI	BN2	Valuetronics	WLIL.SI	F34	Wilmar International
8	BRCA.SI	BEC	BRC Asia	TBEV.SI	Y92	Thai Beverage
9	BHGR.SI	BMGU	BHG Retail REIT	CATL.SI	C31	CapitaLand
10	ARAU.SI	XZL	ARA US Hospitality	HKLD.SI	H78	Hongkong Land

Momentum Factor

Long Portfolio: Outperforming Stocks				Short Portfolio: Underperforming Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	AEM.SI	AWX	AEM Holdings	SCMN.SI	S51	Sembcorp Marine
2	KEPE.SI	AJBU	Keppel DC REIT	SLVX.SI	5CP	Silverlake Axis
3	UMSH.SI	558	UMS Holdings	ARAU.SI	XZL	ARA US Hospitality
4	SHEN.SI	OV8	Sheng Siong Group	GSHC.SI	BDX	GSH
5	FREN.SI	E28	Frencken	HPHT.SI	NS8U	HPH Trust
6	ACCO.SI	ADQU	Accordia Golf Trust	GAGR.SI	E5H	Golden Agri-Resources
7	MAPI.SI	ME8U	Mapletree Industrial	SPRM.SI	T39	Singapore Press
8	JAPF.SI	UD2	Japfa	JSH.SI	J37	Jardine Strategic
9	MAPL.SI	M44U	Mapletree Logistics	SATS.SI	S58	SATS
10	NETL.SI	CJLU	NetLink NBN Trust	CMDG.SI	C52	ComfortDelGro

Low Volatility Factor

Long Portfolio: Low Risk Stocks				Short Portfolio: High Risk Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	DASI.SI	CEDU	Dasin Retail	CROM.SI	CNNU	Cromwell REIT
2	BSES.SI	B61	Bukit Sembawang	CREA.SI	C76	Creative Technology
3	HPAR.SI	H02	Haw Par	ESRR.SI	J91U	ESR-REIT
4	WTHS.SI	W05	Wing Tai	AEM.SI	AWX	AEM Holdings
5	OCBC.SI	O39	OCBC Bank	SCMN.SI	S51	Sembcorp Marine
6	KOUF.SI	VL6	Koufu	ARAU.SI	XZL	ARA US Hospitality
7	SPOS.SI	S08	Singapore Post	YOMA.SI	Z59	Yoma Strategic
8	NETL.SI	CJLU	NetLink NBN Trust	LMRT.SI	D5IU	Lippo Malls Indonesia
9	UOBH.SI	U11	UOB	JAPF.SI	UD2	Japfa
10	ASIA.SI	S7OU	Asian Pay Television	HPHT.SI	NS8U	HPH Trust

Quality Factor

Long Portfolio: High Quality Stocks				Short Portfolio: Low Quality Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	SGXL.SI	S68	SGX	SCMN.SI	S51	Sembcorp Marine
2	AEM.SI	AWX	AEM Holdings	SIAL.SI	C6L	SIA
3	CHSN.SI	QES	China Sunshine	ASIA.SI	S7OU	Asian Pay Television
4	VLUE.SI	BN2	Valuetronics	GSHC.SI	BDX	GSH
5	SLVX.SI	5CP	Silverlake Axis	CESE.SI	C29	Chip Eng Seng
6	PROP.SI	OYY	PropNex	THOS.SI	A50	Thomson Medical
7	VENM.SI	V03	Venture Corporation	KEPL.SI	A7RU	Keppel Infrastructure
8	SATS.SI	S58	SATS	HPHT.SI	NS8U	HPH Trust
9	SHEN.SI	OV8	Sheng Siong Group	DASI.SI	CEDU	Dasin Retail
10	UMSH.SI	558	UMS Holdings	CALT.SI	K2LU	ARA LOGOS REIT

Growth Factor

Long Portfolio: High Growth Stocks				Short Portfolio: Low Growth Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	AEM.SI	AWX	AEM Holdings	THOS.SI	A50	Thomson Medical
2	COSC.SI	F83	Cosco Shipping	SABA.SI	M1GU	Sabana REIT
3	BRCA.SI	BEC	BRC Asia	CREA.SI	C76	Creative Technology
4	DASI.SI	CEDU	Dasin Retail	SCMN.SI	S51	Sembcorp Marine
5	CEWL.SI	U9E	China Everbright	CALT.SI	K2LU	ARA LOGOS REIT
6	GSHC.SI	BDX	GSH	MAPE.SI	RW0U	Mapletree NAC
7	PROP.SI	OYY	PropNex	GUOC.SI	F17	GuocoLand
8	SASS.SI	CRPU	Sasseur REIT	OXHL.SI	5UX	Oxley
9	YAZG.SI	BS6	YZJ Shipbuilding	ESRR.SI	J91U	ESR-REIT
10	FREN.SI	E28	Frencken	GAGR.SI	E5H	Golden Agri-Resources

Dividend Yield Factor

Long Portfolio: High Yielding Stocks				Short Portfolio: Low Yielding Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	HPHT.SI	NS8U	HPH Trust	SCMN.SI	S51	Sembcorp Marine
2	LMRT.SI	D5IU	Lippo Malls Indonesia	SUNP.SI	5GD	Sunpower Group
3	FRET.SI	AW9U	First REIT	AINT.SI	CY6U	Ascendas India
4	CROM.SI	CNNU	Cromwell REIT	THOS.SI	A50	Thomson Medical
5	ASIA.SI	S7OU	Asian Pay Television	BSES.SI	B61	Bukit Sembawang
6	KPEL.SI	CMOU	Keppel Pacific Oak	GSHC.SI	BDX	GSH
7	ECWO.SI	BWCU	EC World REIT	HONG.SI	H30	Hong Fok
8	STHL.SI	P40U	Starhill Global REIT	SIAL.SI	C6L	SIA
9	SUND.SI	BHQ	Sunningdale Tech	JAPF.SI	UD2	Japfa
10	SABA.SI	M1GU	Sabana REIT	AEM.SI	AWX	AEM Holdings

Source: FactorResearch

In addition to the single factor portfolios, we also highlight the top and bottom stocks of a multi-factor portfolio that was created using the five factors most supported by academic research, i.e. Value, Size, Momentum, Low Volatility, and Quality.

Multi-Factor

Long Portfolio: Highly Ranked Stocks				Short Portfolio: Low Ranked Stocks		
Rank	RIC	Ticker	Company Name	RIC	Ticker	Company Name
1	PROP.SI	OYY	PropNex	SCMN.SI	S51	Sembcorp Marine
2	HONG.SI	H30	Hong Fok	SIAL.SI	C6L	SIA
3	SASS.SI	CRPU	Sasseur REIT	GSHC.SI	BDX	GSH
4	VLUE.SI	BN2	Valuetronics	ESRR.SI	J91U	ESR-REIT
5	BHGR.SI	BMGU	BHG Retail REIT	THOS.SI	A50	Thomson Medical
6	TIAN.SI	T14	Tianjin Zhongxin	DAIR.SI	D01	Dairy Farm
7	IREI.SI	UD1U	IREIT Global	MAPE.SI	RW0U	Mapletree NAC
8	CHSN.SI	QES	China Sunshine	STEL.SI	Z74	Singtel
9	BRCA.SI	BEC	BRC Asia	COSC.SI	F83	Cosco Shipping
10	KOUF.SI	VL6	Koufu	CALT.SI	K2LU	ARA LOGOS REIT

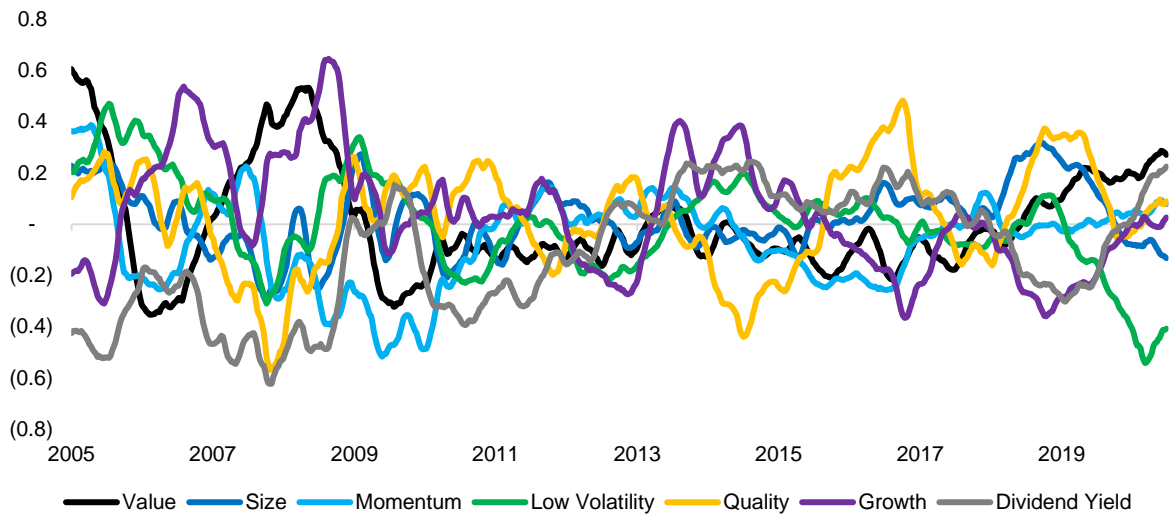
Source: FactorResearch

Factor Exposure of the Singapore Stock Market

In addition to analyzing the factor exposure of each stock, we can also explore if the Singapore stock market exhibits structural factor exposure given sector biases towards financials, real estate, and industrial companies.

We conduct a regression-based factor exposure analysis of the Singaporean stock market by using global long-short, beta-neutral factors. The analysis highlights that stocks in the Singapore market had significant exposure to classic equity factors over time, but it was time-varying and zero on average for all seven factors over time.

Factor Exposure Analysis of the Singapore Stock Market: Factor Betas



Source: FactorResearch

The factor exposure analysis highlights that although the Singapore stock market has structural sector biases, this did not translate into equivalent consistent factor exposures.

If investors believe an economic recovery is ahead, then factors like Value, Size, and Dividend Yield are expected to generate attractive excess returns based on historical data. The factor exposure of the Singapore stock market currently offers high exposure to Value and Dividend Yield, so could be used as a proxy for betting on a global economic recovery from a factor perspective. In contrast, the S&P 500 has currently negative exposure to Value given high valuation multiples and would be less attractive from this perspective.

Factor Exposure by Sectors, Market Capitalization, and Geographies

In addition, we can analyze the factor exposure by sectors, although we need to be careful when interpreting the results given that some sectors like energy are comprised of one single stock.

The factor exposure for each stock is calculated using the bottom-up approach that ranks each stock by the different factor definitions relative to all other stocks in the universe. We then create an average factor rank by equal weighting the ranks of all stocks per sector.

Some of the insights are not unexpected, e.g. stocks from the technology sector have negative exposure to the Value and Low Volatility factors, i.e. are expensive and volatile compared to the other stocks.

Singapore Stock Market: Average Factor Exposure by Sectors									
Sector	Stocks	Value	Size	Momentum	Low Volatility	Quality	Growth	Dividend Yield	Multi-Factor
Real Estate	59	54	54	55	58	66	56	53	59
Industrials	18	57	64	73	66	58	53	66	72
Staples	9	73	76	55	54	57	56	75	72
Technology	8	79	30	45	88	17	43	60	44
Communication	5	66	68	60	21	69	80	33	53
Discretionary	5	62	65	45	48	58	61	55	55
Financials	4	55	111	42	14	32	29	46	37
Health Care	4	69	64	46	38	43	59	83	42
Utilities	2	58	63	54	48	90	21	27	70
Energy	1	26	38	64	50	12	28	55	11
Materials	1	9	11	97	68	3	15	83	8

Legend: Positive Factor Exposure Negative Factor Exposure

Source: FactorResearch

Next, we analyze the factor exposure of stocks in the Singapore market by market capitalization, where the universe of available stocks is divided equally by using the median market capitalization of S\$1.7 billion.

Singapore Stock Market: Average Factor Exposure by Market Capitalization									
Sector	Stocks	Value	Size	Momentum	Low Volatility	Quality	Growth	Dividend Yield	Multi-Factor
Large Stocks	58	63	88	54	43	53	55	57	65
Small Stocks	58	54	30	59	71	63	52	57	53

Legend: Positive Factor Exposure Negative Factor Exposure

Source: FactorResearch

The results indicate that small and large caps exhibit significant differences in exposure to factors, which are rather intuitive, e.g. small caps are cheaper, more volatile, and lower in quality than large caps.

In contrast, there is no large difference in exposure to the Momentum and Growth factors. Smaller companies have more potential for growth in earnings and sales than large caps, but there are also stocks that have fallen from grace as they represent declining businesses. Naturally, both types of stocks can outperform, which often is driven by a few select names.

The only exposure that is somewhat surprising is the one to the Dividend Yield factor as small caps typically feature higher yields than large caps. However, this can be explained by the large number of real estate stocks in the Singapore stock market, which feature high dividend yields and are represented in both market capitalization segments.

Finally, we review the factor exposure of the stocks in the Singapore market by the location of their headquarters. The analysis highlights that the factor exposure of geographies varies and there is not one that offers strongly positive or negative exposure for all factors. It is worth noting that many of the companies headquartered in Singapore, do generate revenues in other countries.

Singapore Stock Market: Average Factor Exposure by Geography										
Geography	Stocks	Value	Size	Momentum	Low Volatility	Quality	Growth	Dividend Yield	Multi-Factor	
Singapore	73	65	63	56	49	58	56	60	59	
China	12	26	38	54	62	51	29	52	30	
Hong Kong	7	43	81	84	65	56	75	53	84	
South East Asia	12	62	56	58	79	58	49	57	72	
Developed Markets	12	58	38	39	74	69	44	47	57	

Legend:

Positive Factor Exposure

Negative Factor Exposure

Source: FactorResearch

FURTHER THOUGHTS

We set out to explore if popular investment strategies like Value and Momentum are as effective in Singapore's stock market as in other stock markets, which this analysis confirms. Investors can create single or multi-factor portfolios to harvest excess returns using stocks in Singapore, despite their unique characteristics.

However, factor investing does not represent a free lunch as factors, even if combined in a multi-factor portfolio, are as cyclical as equity markets and go through periods of underperformance like in recent years. As typically in finance, no pain, no premium.

APPENDIX

The table below provides the current factor exposure of the approximately 120 most liquid stocks on the Singapore stock market, which means each stock is ranked between 1 and 120. The stock with the most positive factor exposure is ranked 1.

Factor Rankings of Most Liquid Stocks in the Singapore Market										
Legend:			Positive Factor Exposure			Negative Factor Exposure				
RIC	Ticker	Name	Value	Size	Momentum	Low Volatility	Quality	Growth	Dividend Yield	Multi-Factor
DBSM.SI	D05	DBS Group	42	116	47	15	50	16	34	43
STEL.SI	Z74	Singtel	108	114	80	13	73	88	51	109
UOBH.SI	U11	UOB	33	112	55	9	39	23	41	36
OCBC.SI	O39	OCBC Bank	35	113	50	5	38	20	37	30
SGXL.SI	S68	SGX	111	101	15	28	1	55	73	39
SIAL.SI	C6L	SIA	83	105	101	36	114	57	98	115
CATL.SI	C31	CapitaLand	12	108	67	26	82	24	64	60
CMDG.SI	C52	ComfortDelGro	77	80	103	37	20	82	26	77
YAZG.SI	BS6	YZJ Shipbuilding	8	84	95	101	18	9	52	66
GENS.SI	G13	Genting Singapore	80	102	42	48	19	21	44	56
JARD.SI	J36	Jardine Matheson	16	115	88	55	44	53	66	79
WLIL.SI	F34	Wilmar International	91	110	12	44	90	54	79	95
KPLM.SI	BN4	Keppel	78	104	29	18	87	61	77	76
STEG.SI	S63	ST Engineering	105	103	56	29	15	38	58	71
SATS.SI	S58	SATS	90	81	104	79	8	59	27	99
CTDM.SI	C09	City Developments	51	98	39	53	97	86	95	86
VENM.SI	V03	Venture Corporation	86	91	20	40	7	18	61	35
SPRM.SI	T39	Singapore Press	14	65	106	43	57	94	40	50
HKLD.SI	H78	Hongkong Land	48	107	96	32	60	74	42	94
TBEV.SI	Y92	Thai Beverage	59	109	52	46	53	-	88	80
SCIL.SI	U96	Sembcorp Industries	29	82	69	90	103	60	84	105
JSH.SI	J37	Jardine Strategic	24	111	105	80	42	65	92	100
JCYC.SI	C07	Jardine Cycle & Carriage	37	99	102	49	51	32	34	87
UTOS.SI	U14	UOL Group	23	92	32	12	58	12	87	21
DAIR.SI	D01	Dairy Farm	107	100	93	41	61	81	56	111
AEM.SI	AWX	AEM Holdings	103	36	1	109	2	1	96	38
NETL.SI	CJLU	NetLink NBN Trust	106	86	10	8	52	41	45	41
UMSH.SI	558	UMS Holdings	96	23	3	94	10	19	59	25
SHEN.SI	OV8	Sheng Siong Group	115	74	4	16	9	31	89	22
GAGR.SI	E5H	Golden Agri-Resources	10	63	107	91	96	97	72	101
KEPL.SI	A7RU	Keppel Infrastructure	112	77	13	30	109	36	23	92
SCMN.SI	S51	Sembcorp Marine	68	41	112	108	115	103	105	116
STAR.SI	CC3	StarHub	88	70	44	31	48	83	22	49
HIPI.SI	H17	Hi-P International	75	40	76	100	16	37	86	67
SPOS.SI	S08	Singapore Post	82	61	62	7	29	39	75	31
YNLG.SI	Z25	Yanlord Land	1	72	45	23	72	80	38	17
VLUE.SI	BN2	Valuetronics	34	7	46	73	4	68	25	4
JAPF.SI	UD2	Japfa	65	52	8	104	65	47	97	58
RAFG.SI	BSL	Raffles Medical	109	60	36	11	27	73	85	32
FRLD.SI	EB5	First Resources	102	68	41	51	28	75	91	55
HPAR.SI	H02	Haw Par	38	67	85	3	23	25	80	19
SIAE.SI	S59	SIA Engineering	72	69	57	66	14	93	69	47
YOMA.SI	Z59	Yoma Strategic	79	32	53	106	77	42	105	96
FREN.SI	E28	Frencken	63	15	5	97	13	10	78	12
SLVX.SI	5CP	Silverlake Axis	61	31	111	89	5	69	21	61
CSES.SI	544	CSE Global	60	4	40	84	34	27	24	23
HPHT.SI	NS8U	HPH Trust	2	51	108	103	108	95	1	104
OLAM.SI	O32	Olam International	17	90	79	20	95	17	39	63
DELF.SI	P34	Delfi	92	21	100	75	17	49	62	64
OXHL.SI	SUX	Oxley	18	43	82	77	93	99	60	74
WTHS.SI	W05	Wing Tai	52	54	38	4	62	62	94	15
COSC.SI	F83	Cosco Shipping	93	20	98	87	88	2	105	108
CNAO.SI	G92	China Aviation Oil	26	38	64	50	12	28	55	11
OVES.SI	LJ3	OUE	5	47	70	14	86	50	92	24
THOS.SI	A50	Thomson Medical	116	56	48	81	110	106	102	112
ACCO.SI	ADQU	Accordia Golf Trust	22	33	6	67	104	84	31	28

Factor Rankings of Most Liquid Stocks in the Singapore Market (Continued)

Legend:		Positive Factor Exposure	Negative Factor Exposure							
GUOC.SI	F17	GuocoLand	6	62	72	19	91	100	54	37
CREA.SI	C76	Creative Technology	114	5	65	111	54	104	105	97
BRCA.SI	BEC	BRC Asia	58	8	19	45	59	3	70	9
TIAN.SI	T14	Tianjin Zhongxin	11	71	16	58	11	30	63	6
SUNP.SI	5GD	Sunpower Group	27	12	33	102	98	29	104	44
BSES.SI	B61	Bukit Sembawang	47	44	83	2	35	26	101	16
CESE.SI	C29	Chip Eng Seng	20	19	68	25	111	43	17	33
CEWL.SI	U9E	China Everbright	3	48	94	65	70	5	30	48
KOUF.SI	VL6	Koufu	98	14	25	6	46	79	74	10
ASIA.SI	S7OU	Asian Pay Television	13	6	61	10	113	96	5	14
FRPL.SI	TQ5	Frasers Property	7	83	92	27	100	70	81	72
CHSN.SI	QES	China Sunshine	9	11	97	68	3	15	83	8
MOIL.SI	M04	Mandarin Oriental	71	76	51	72	71	87	90	93
HONG.SI	H30	Hong Fok	4	30	59	22	41	11	99	2
SUND.SI	BHQ	Sunningdale Tech	49	2	78	42	67	91	9	29
PROP.SI	OYY	PropNex	76	3	17	17	6	7	43	1
APAC.SI	CLN	APAC Realty	50	1	81	60	24	46	46	20
GSHC.SI	BDX	GSH	101	16	109	93	112	6	100	114
AEMN.SI	A17U	Ascendas REIT	104	106	14	33	83	-	53	89
CMLT.SI	C38U	CapitaLand Mall Trust	56	96	73	52	30	34	50	68
MAPL.SI	M44U	Mapletree Logistics	99	97	9	59	74	71	68	88
MACT.SI	N2IU	Mapletree Commercial	70	94	26	54	31	45	66	46
CACT.SI	C61U	CapitaLand Commercial	73	95	63	39	37	33	48	69
SUNT.SI	T82U	Suntec REIT	25	87	77	47	55	58	32	57
MAPLSI	ME8U	Mapletree Industrial	100	93	7	63	22	63	64	51
KEPE.SI	AJBU	Keppel DC REIT	113	89	2	34	47	22	82	52
FRAE.SI	BUOU	Fraser Logistics	94	88	18	85	32	-	34	78
MAPE.SI	RWOU	Mapletree NAC	66	78	89	56	101	101	14	110
KASA.SI	K71U	Keppel REIT	81	85	35	38	75	89	49	75
ASCO.SI	HMN	Ascott Residence	53	79	66	64	78	77	19	90
FCRT.SI	J69U	Fraser Centrepoint	69	75	34	83	33	48	57	59
ESRR.SI	J91U	ESR-REIT	89	53	71	110	105	98	11	113
MANU.SI	BTOU	Manulife US REIT	87	58	37	99	89	-	13	102
CDLT.SI	J85	CDL Hospitality	30	49	91	86	63	52	16	81
CRCT.SI	AU8U	CapitaLand Retail China	31	57	49	62	68	76	12	42
LEND.SI	JYEU	Lendlease Global	85	34	-	-	-	-	105	62
CROM.SI	CNNU	Cromwell REIT	36	59	30	112	49	-	4	54
AINI.SI	CY6U	Ascendas India	54	55	27	82	25	-	103	34
SPHR.SI	SK6U	SPH REIT	64	73	54	24	43	56	76	40
PWLR.SI	C2PU	Parkway Life REIT	97	64	11	21	36	51	71	27
KPEL.SI	CMOU	Keppel Pacific Oak	62	50	24	92	45	14	6	45
SASS.SI	CRPU	Sasseur REIT	19	37	23	57	21	8	20	3
AART.SI	O5RU	AIMS APAC Reit	45	35	43	35	56	44	-	18
FRET.SI	AW9U	First REIT	32	27	84	98	64	64	3	65
STHL.SI	P40U	Starhill Global REIT	41	45	87	69	84	92	8	82
PRIE.SI	OXMU	Prime US REIT	84	46	-	-	69	78	105	83
FAEH.SI	Q5T	Far East Hospitality	39	42	74	71	81	40	29	70
QUEC.SI	TS0U	Que Commercial REIT	43	66	58	74	99	85	18	91
CALT.SI	K2LU	ARA LOGOS REIT	95	29	75	76	106	102	-	107
IREI.SI	UD1U	IREIT Global	28	22	22	88	26	35	15	7
LMRT.SI	D5IU	Lippo Malls Indonesia	57	17	99	105	102	13	2	106
ECWO.SI	BWCU	EC World REIT	21	26	28	61	66	67	7	13
ELIE.SI	MXNU	Elite Commercial	110	18	-	-	94	-	105	103
FRHO.SI	ACV	Fraser Hospitality	46	39	90	78	80	90	47	84
SBSR.SI	SV3U	Soilbuild Business Space	40	24	86	95	92	72	105	85
SABA.SI	M1GU	Sabana REIT	55	13	60	96	85	105	10	73
ARAU.SI	XZL	ARA US Hospitality	44	10	110	107	79	-	105	98
UNIE.SI	ODBU	United Hampshire	67	28	-	-	76	-	105	53
DASI.SI	CEDU	Dasin Retail	74	25	21	1	107	4	33	26
BHGR.SI	BMGU	BHG Retail REIT	15	9	31	70	40	66	28	5