

Quantitative Monographs

China domestic market—alpha opportunity for quantitative investors

Equities

Global
Quantitative

Launching quant coverage for China's domestic market

In the 25 years since its inception, China's stock market has become the second-largest in the world in terms of both market capitalisation and trading value. As the country gradually tears down the barriers, more global investors are able to participate in the market. To help global investors better understand the market structure and alpha-generating opportunities with systematic investment, we are launching our quant coverage for the China domestic market.

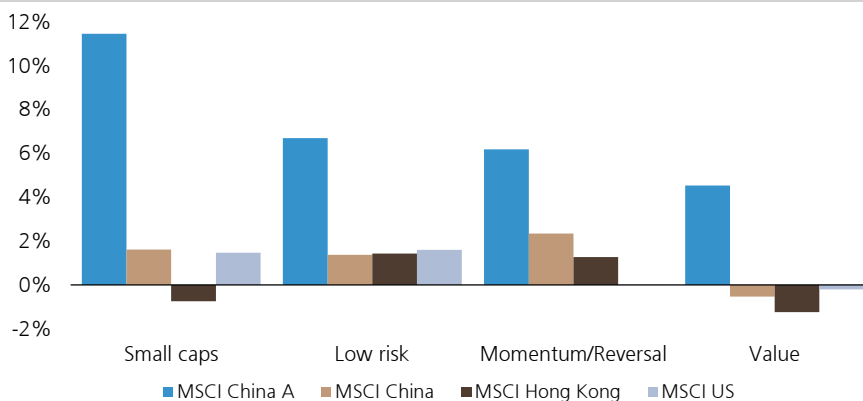
What makes it interesting to global investors?

Overall, the market has had sound risk-adjusted factor performance over the past decade. Characterised by an extremely high proportion of retail investors, the Chinese market is much less concentrated in size and liquidity than Western markets, and has large size and liquidity premiums—this results in a relatively low correlation with other markets, delivering a potential source of diversified alpha.

Alpha opportunity for quantitative investors

The high retail participation ratio generates ample alpha opportunities, in our view. As the market is relatively under-explored by quantitative managers, the alpha is generally stronger and persistent. Simple style-based strategies provide stronger returns in China than developed markets such as Hong Kong and the US. Size, Price Reversal, Value and Risk factors are among the best performers.

Figure 1: Stronger factor performance in China



Note: The back test period is from Jan 2006 to Sep 2016. Performance is calculated relative to benchmarks in USD. Performance for Low risk is the simple average of performance of low 3m, 6m, 12m vol and low 3m, 12m beta. Performance for value is the simple average of performance of high forward Book to Price, high forward Earnings Yield, high forward Dividend Yield, high Sales Yield, high Free Cash Flow Yield, high EBIT / EV. For MSCI China A, the performance for Momentum/Reversal is calculated as simple average of performance of low 1m, 6m, and 12m Price momentum. For MSCI China, MSCI Hong Kong, MSCI US, the performance for Momentum/Reversal is calculated as simple average of performance of low 1m Price momentum, high 6m and 12m Price momentum.

Source: MSCI, Wind, FactSet, UBS Quantitative Research

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Summary

China is now the second-largest economy in the world, with the second-largest stock market in terms of both market capitalisation and trading value. We believe the market has become too big and too important to ignore. As the country gradually liberates its financial system, more global investors are able to participate in the market. To help global investors better understand the market structure and alpha-generating opportunities with systematic investment, we are launching our quant coverage of the China domestic market.

Most investors still recall the market turmoil of 2015, but over the last decade, according to data, China's domestic market has delivered sound performance, better than both Hong Kong and the US markets.

One of the unique characteristics of China's domestic market is its extremely high participation rate for retail investors. This brings in a very different market structure as well as behaviour, and as a result, it has low correlation with other markets.

More importantly, it creates a lot of mispricing, and hence opportunity. As the market is under-explored by quantitative investors, the alphas are generally stronger and long-lasting. Some of our key findings are as follows:

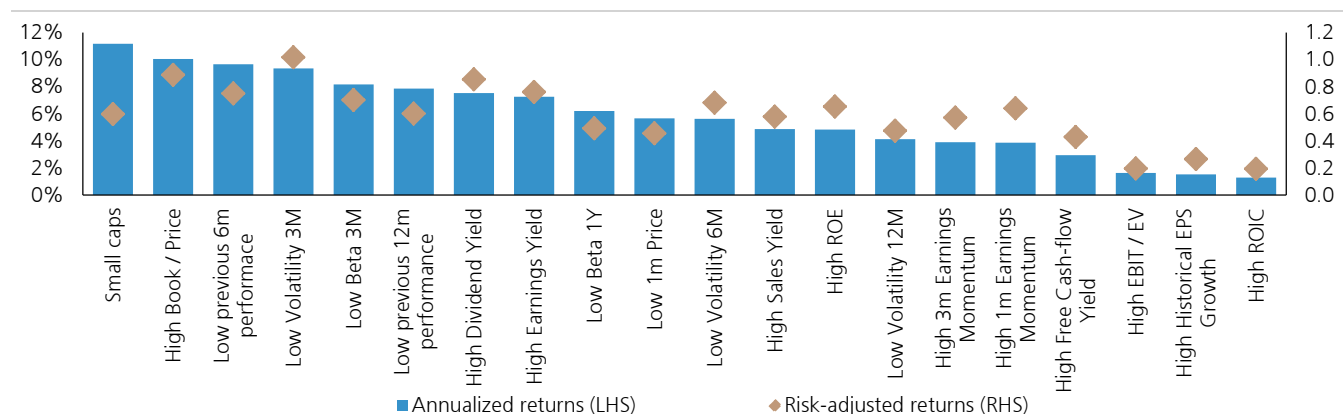
1. Small caps outperform due to strong forecasted earnings growth
2. The price reversal effect dominates for price momentum strategies with holding periods greater than or equal to one month
3. Surprisingly, Value and Low volatility, low beta strategies perform well, especially in the large cap universe.

China's domestic stock market is too big and too important to ignore

Sound performance and the uniqueness of the market make it a good source of diversified alpha for global investors

The factor models yield better returns than developed markets such as Hong Kong and the US

Figure 2: Top 20 factors in China



Source: MSCI, Wind¹, FactSet, UBS Quantitative Research

Note: The back test is run for MSCI China A universe since Jan 2006. The factor performance is calculated using the cap-weighted USD total return of high basket minus low basket, except for the ones with asterisk, where the performance is calculated using low minus high. Please refer to Appendix for definition of factors and back test methodology.

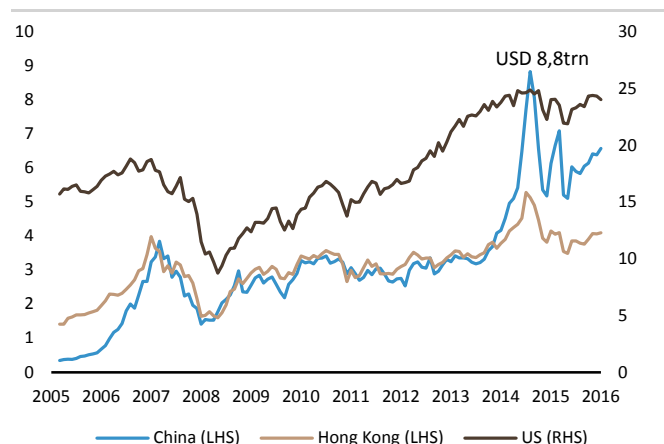
¹ Wind is a major financial data vendor in China.

Performance overview

A growing market...

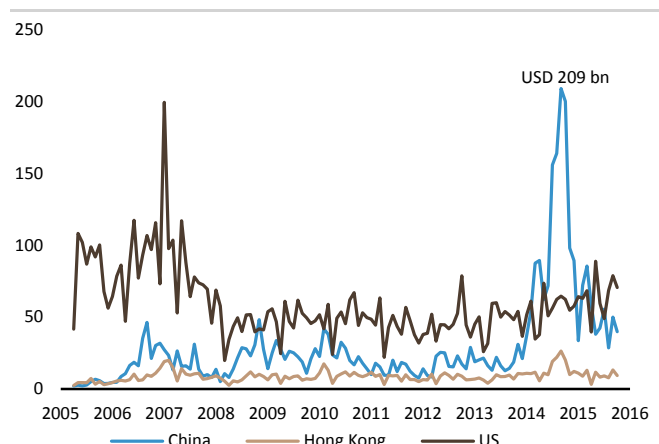
Since its inception in 1991, China's domestic stock market has gone through periods of dramatic changes and rapid development. After 25 years in operation, it has become the second largest in the world in terms of both market capitalisation and trading volume.

Figure 3: Historical market cap (in trillion USD)



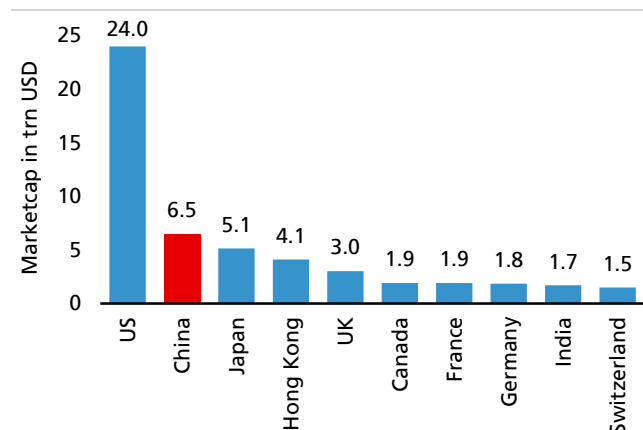
Source: Bloomberg, UBS Quantitative Research

Figure 4: Monthly trading value (in billion USD)



Source: Bloomberg, UBS Quantitative Research

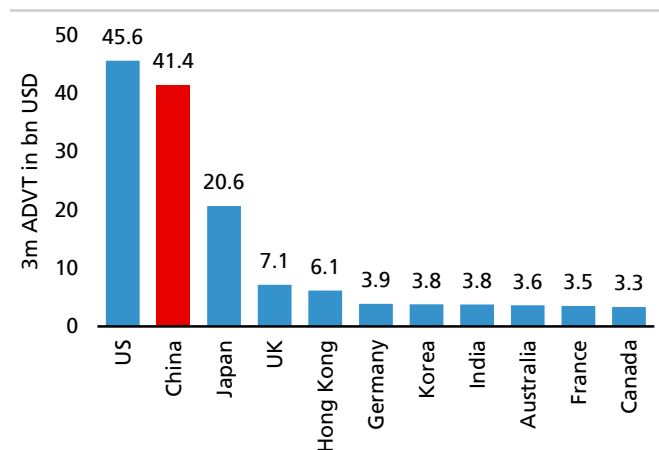
Figure 5: Top 10 largest stock markets in the world



Note: Data as of 14 October 2016.

Source: Bloomberg, UBS Quantitative Research

Figure 6: Top 10 stock markets with highest trading value



Note: Data as of 14 October 2016.

ADVT represents average daily value traded.

Source: Bloomberg, UBS Quantitative Research

The China domestic market is also very active and liquid. Although its market cap is just over a quarter of that for the US, its trading volume is almost comparable to the US market. This implies that turnover in China's market is almost four times as high as in the US market. The extremely high turnover is mainly driven by a large

proportion of retail investors in the market (over 85%²), who trade much more actively than institutional investors.

... with sound performance over the past decade

Since 2006³, returns for the China A-share market have been double that of the US and Hong Kong, according to data. Admittedly, its strong performance can be mainly attributed to three booming markets in 2006-07, 2009 and 2014. In between, the market experienced two big crashes and a long period of range bound performance between 2010 and 2013. Thus, it is not surprising to see that China's domestic market has had the highest volatility and largest maximum drawdown compared to Hong Kong and the US. Nevertheless, on a risk-adjusted basis (measured by both Sharpe ratio and Calmar ratio), China still had the best performance over the past decade (see Figure 7 and Figure 8) compared to Hong Kong and the US.

On our estimates, China's domestic market has generated better risk-adjusted performance than Hong Kong and the US since 2006

Figure 7: Performance comparison between the US, Hong Kong and China

	US market			Hong Kong market			China domestic market		
	Russell 3000	S&P 500	MSCI US	HSI	MSCI China	MSCI Hong Kong	Shanghai Comp	CSI300	MSCI China A
Annualised mean return	7%	6%	6%	7%	11%	8%	14%	18%	18%
Annualised median return	13%	13%	13%	10%	24%	9%	17%	14%	17%
Annualised standard deviation	15%	15%	15%	22%	27%	22%	31%	34%	33%
Sharpe ratio	0.43	0.42	0.43	0.30	0.40	0.36	0.44	0.52	0.53
Max drawdown	-53%	-53%	-52%	-59%	-66%	-57%	-71%	-71%	-70%
Calmar ratio	0.12	0.12	0.12	0.11	0.17	0.14	0.20	0.25	0.26
Quantile 1	-2%	-2%	-2%	-3%	-3%	-2%	-4%	-4%	-5%
Quantile 3	3%	3%	3%	4%	5%	4%	6%	7%	7%
Min	-18%	-17%	-17%	-22%	-23%	-22%	-25%	-26%	-25%
Max	11%	11%	11%	17%	19%	17%	27%	28%	28%

Note: Time period for the calculation is from Jan 2006 to Sep 2016. All returns are in local currencies.

Source: Bloomberg, Wind, UBS Quantitative Research

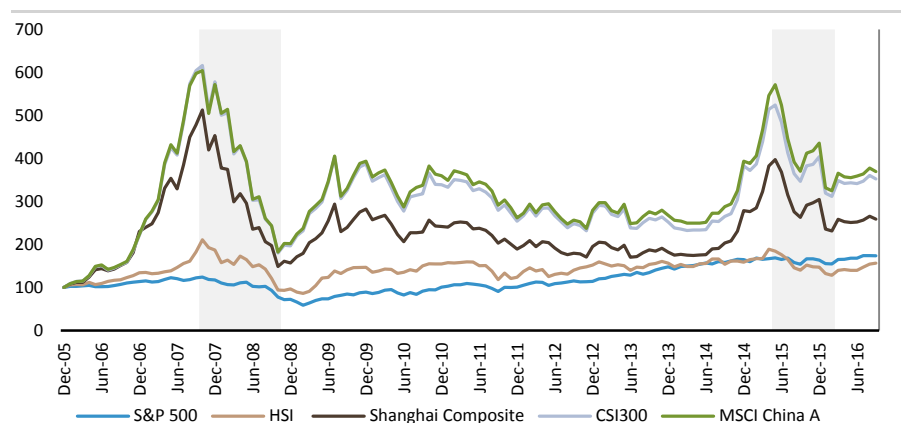
Big crashes in China's history

Since 2006, China's stock market has had two big crashes. The first crash is attributed to the Global Financial Crisis (GFC). It lasted 14 months from October 2007 to November 2008 in China. There was a large drawdown of more than 70%, compared to 50% and 60% in the US and Hong Kong during the same period, respectively.

² According to the Shanghai stock exchange, retail investors accounted for 86.9% of market trading volume as of end-2015.

³ We run our analysis since Jan 2006. As China started the Split-Share Structure Reform (SSSR) on non-tradable shares of equities in 2005 and the market structure for that was different and irrelevant for today.

Figure 8: Market performance and large crashes in history



Note: This figure displays price return indices in local currencies, normalised at the end of December 2005.

Source: Bloomberg, UBS Quantitative Research

The second market crash started in June 2015, triggered by government regulations that deleveraged and limited trading on margins. Aftershocks continued in the following months, with a series of negative catalysts including headwinds from economic growth and Rmb devaluation. Despite all the bailout and stimulus efforts from the government, stock market value continued to decline. Within half a year, the equity market had lost nearly 50% of its value. The impact also spilled over to Hong Kong. The Hang Seng Index was down 30%, while the US market stayed mostly intact (see Figure 8 and Figure 9).

Figure 9: Market crashes

Period	Peak-to-trough return			Date
	Shanghai Composite	CSI300	MSCI China A	
GFC	-72.0%	-72.3%	-71.4%	Oct 07 - Nov 08
2015-2016 market turbulence	-48.6%	-46.5%	-49.5%	Jun 15 - Jan 16

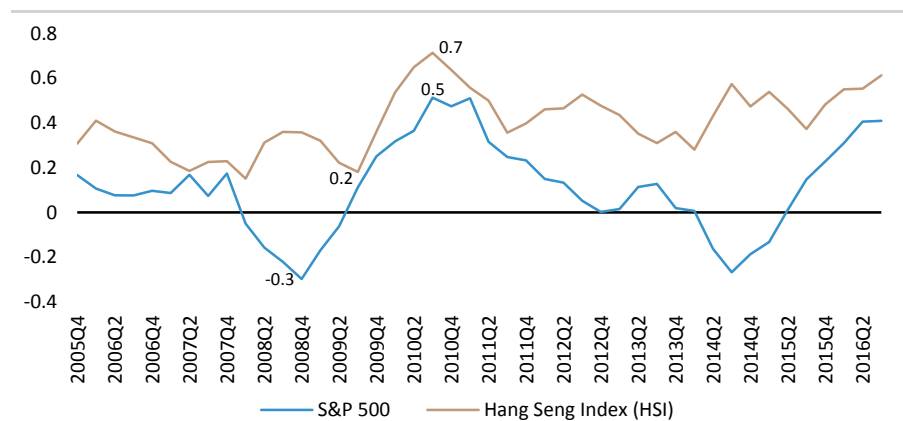
Note: Returns are calculated using price return indices in local currencies.

Source: Bloomberg, UBS Quantitative Research

Low correlation with other markets

The China domestic market's correlation with the US equity market fluctuates. At the start of the GFC in late 2007, China's stock market decoupled from the Western markets and its correlation with the US market lessened. As impact from the GFC spread globally, the correlation increased dramatically and peaked in mid-2010. Since then, the US equity market has continued to recover while performance in the China domestic market was weak. The correlation declined again and reached its trough in mid-2014. In the past 2 years, the correlation has increased again.

Figure 10: Correlation between MSCI China A and SP500, HSI



Note: Correlation is calculated using weekly returns in each quarter.

Source: Bloomberg, UBS Quantitative Research

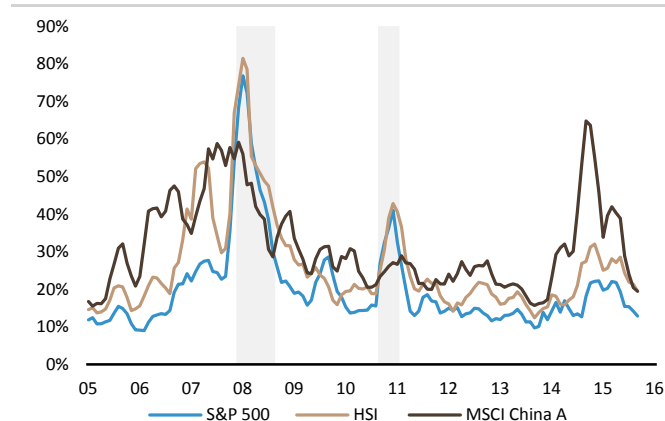
On the other hand, China's stock market has been more correlated with the Hong Kong market as expected. The correlation is also more stable than the one with the US.

Always be aware of the risk

In general, return volatility is higher in China than in the US and Hong Kong. There were two exceptions during the GFC and the European debt crisis (see shaded areas in Figure 11), when volatility of the US and Hong Kong equity markets surpassed that for China.

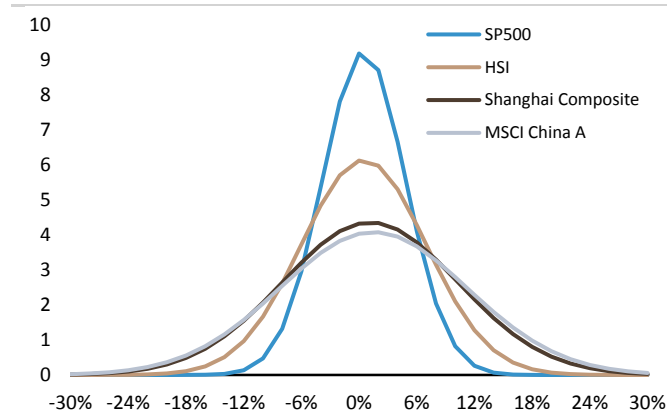
China's domestic market has larger tail risk

Figure 11: Annualised return standard deviation



Note: Standard deviation is calculated using daily returns in each month.
Source: Bloomberg, UBS Quantitative Research

Figure 12: Distribution of monthly returns



Note: Distribution is formed with monthly returns from Jan 2006 to Sep 2016.
Source: Bloomberg, Wind, UBS Quantitative Research

China's stock market turbulence in late 2015 significantly drove up domestic market volatility, all the way up to nearly 60%. During the same period, the highest volatility in the US and Hong Kong were less than 20% and 30%, respectively.

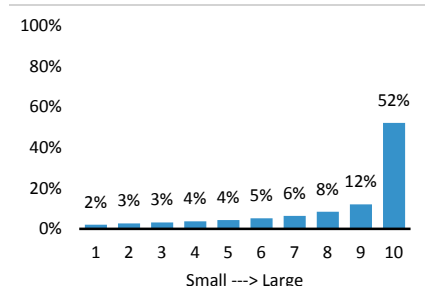
Higher volatility results in larger tail risk. The distribution of monthly returns of major indices in the US, Hong Kong and China suggests tail risk in China's equity market is significantly larger than that for the US and Hong Kong markets (see Figure 12).

Market structure

A less concentrated market...

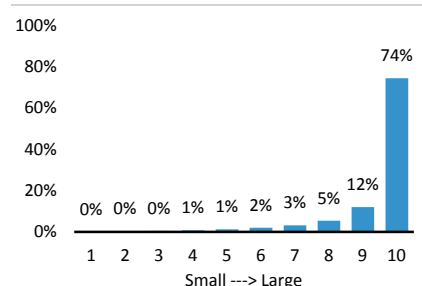
China's stock market embraces far more medium- and small-sized companies, whilst the US and Hong Kong markets are more concentrated on large caps. We first compare the distribution of total market cap for China, Hong Kong and the US⁴. Companies are sorted by size into deciles. The largest decile in China makes up 52% of the total market cap, compared with 74% and 84% in the US and Hong Kong, respectively.

Figure 13: Market cap concentration in China, % of total market cap



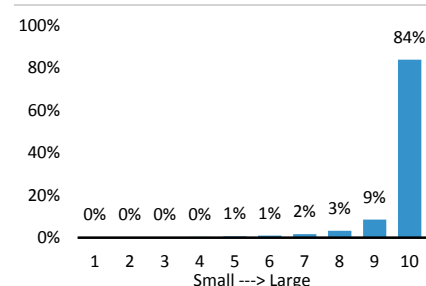
Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative Research

Figure 14: Market cap concentration in US, % of total market cap



Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative Research

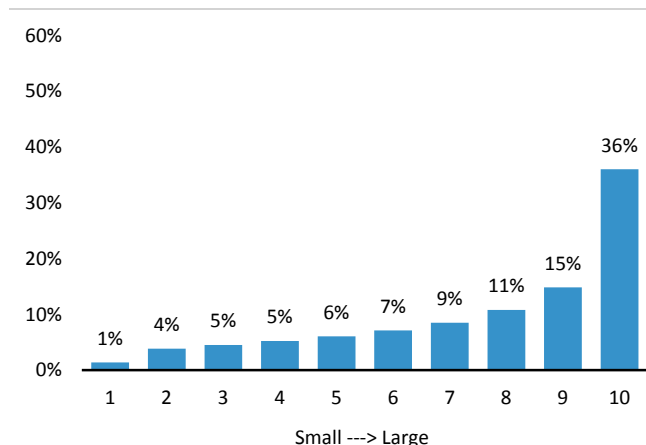
Figure 15: Market cap concentration in Hong Kong, % of total market cap



Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative Research

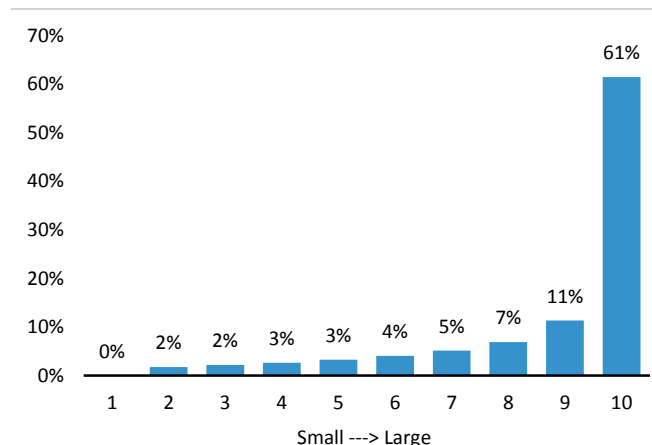
Drilling down to the two exchanges in China, we found that the Shenzhen market has an even flatter curve, with only 36% of its total market cap in the largest decile. This is reasonable as the Shenzhen Stock exchange includes both the SME board (Small and Medium Enterprise) and ChiNext, also known as GEM board (Growth Enterprise Market), which is a NASDAQ-style board in China. Therefore, high-growth companies of comparatively smaller sizes are attracted to list in Shenzhen.

Figure 16: Market cap concentration on Shenzhen exchange, % of total market cap



Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative Research

Figure 17: Market cap concentration on Shanghai exchange, % of total market cap

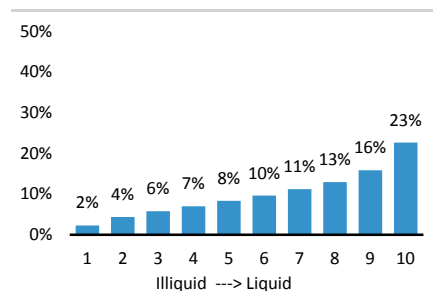


Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative Research

⁴ We use the Russell 3000 index universe as a proxy for the US.

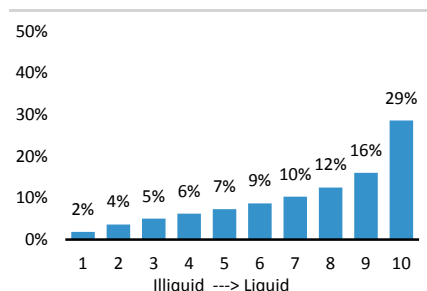
Liquidity⁵ concentration yields similar results. The China market is the least concentrated, followed by the US and Hong Kong.

Figure 18: China, % of total liquidity



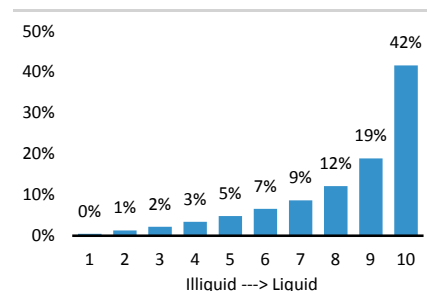
Note: Data as of 20 October 2016.
Source: Wind, UBS Quantitative research

Figure 19: US, % of total liquidity



Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative research

Figure 20: HK, % of total liquidity



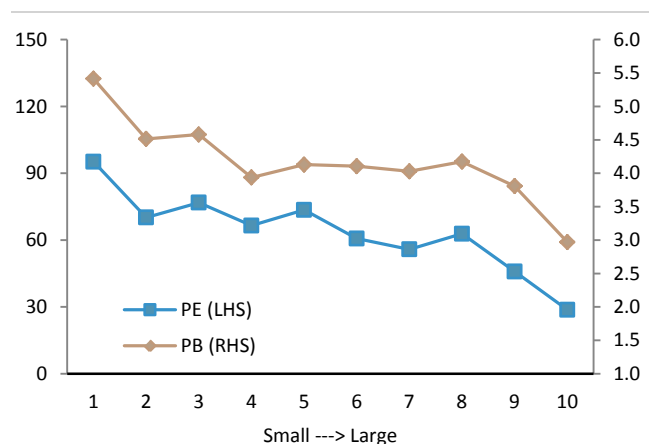
Note: Data as of 20 October 2016.
Source: Bloomberg, UBS Quantitative research

...with a small-cap and liquidity premium

It has been well acknowledged that small-caps enjoy unique popularity in China. We found that investors in China assign higher valuations to smaller stocks than larger stocks (see Figure 21). This is completely opposite to Hong Kong and the US, where investors pay a premium for large caps (see Figure 22).

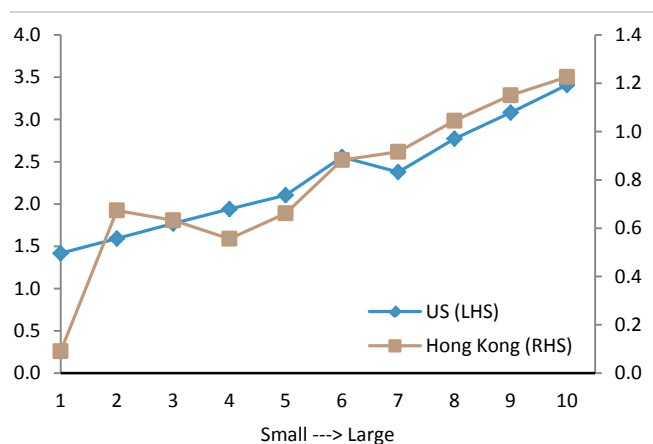
Size and liquidity premium driven by forecasted earnings

Figure 21: PE and P/BV by size in China



Note: Data as of 20 October 2016.
Source: Wind, UBS Quantitative research

Figure 22: P/BV by size in the US and Hong Kong

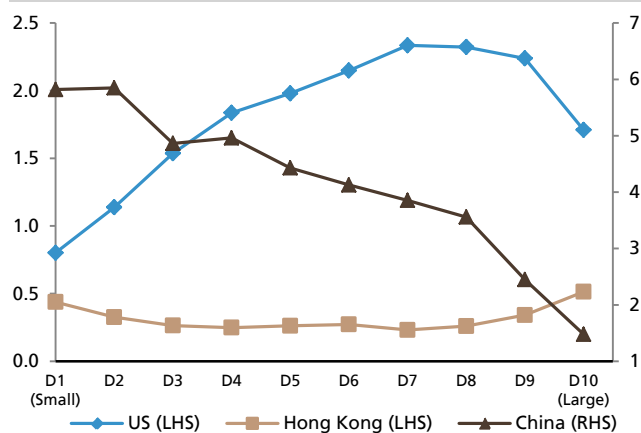


Note: Data as of 20 October 2016.
Source: Bloomberg, FactSet, UBS Quantitative research

What is more, there is a distinct difference between China, the US and Hong Kong in how frequently investors trade stocks with different sizes. Investors in China trade more small-cap stocks, while in the US, large companies attract more trading (except for the largest ones due to high stock prices and super-large market caps in the US). The turnover ratio in Hong Kong is mostly flatter for small and mid-cap stocks and increases significantly for the largest-sized decile (see Figure 23)

⁵ Here we define liquidity as the annualized turnover, calculated as last 12-month volume traded divided by total shares outstanding.

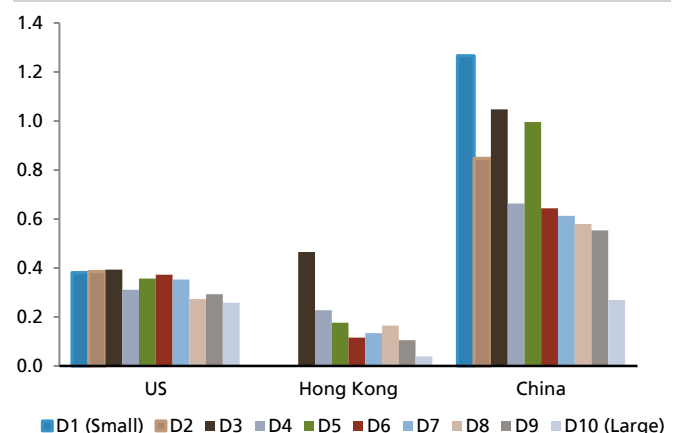
Figure 23: Annualised turnover by size⁶



Note: Data as of 20 October 2016.

Source: Bloomberg, UBS Quantitative Research

Figure 24: Forecasted earnings growth by size⁷



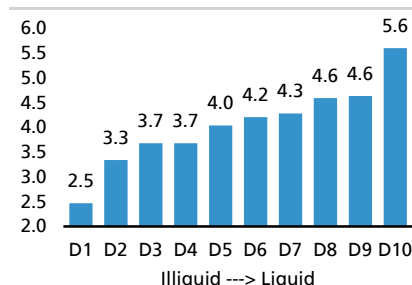
Note: Data as of 20 October 2016.

Source: FactSet, Wind, UBS Quantitative Research

Ultimately, we believe it comes down to the difference in earnings expectations. In China, investors expect much higher future earnings growth for smaller stocks, while gaps in earnings expectations across size bands are narrower in Hong Kong and particularly in the US (see Figure 24).

Similarly, there is a monotonic relationship between liquidity⁸, valuation and forecasted earnings growth in China. The higher the liquidity, the higher the valuation and forecasted earnings growth. We do not observe the same relationship in the US and Hong Kong.

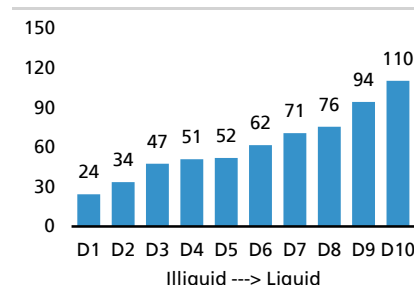
Figure 25: P/BV ratio by liquidity in China



Note: Data as of 20 October 2016.

Source: Wind, UBS Quantitative research

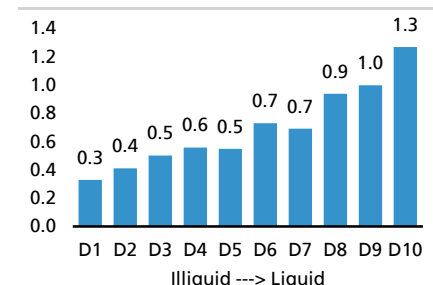
Figure 26: PE ratio by liquidity in China



Note: Data as of 20 October 2016.

Source: Wind, UBS Quantitative research

Figure 27: Forecasted earnings growth by liquidity in China



Note: Data as of 20 October 2016.

Source: Wind, UBS Quantitative research

⁶ Annualized turnover is calculated as last 12-month volume traded divided by total shares outstanding.

⁷ There is no forecast earnings growth for HK market in decile 1 and 2 because there is hardly any analyst coverage for the bottom 20% smallest stocks in HK.

⁸ Here we define liquidity as the annualized turnover, calculated as last 12-month volume traded divided by total shares outstanding.

Alpha opportunity for quantitative investors

One unique feature of the China domestic market is the extremely high proportion of retail investors. According to the Shanghai stock exchange, retail investors accounted for 86.9% of market trading volume as of end-2015. The low institutional participation rate and the even lower presence of quant investors means there is significant mispricing in the market, and hence, ample alpha opportunities.

High participation ratio of retail investors results in ample alpha opportunities

In this section, we look at how the traditional quant factors work in China. We focus on representative factors in different styles, including value, growth, momentum, quality, size and risk⁹. We compare the factor performance in China with the global markets (Hong Kong and the US).

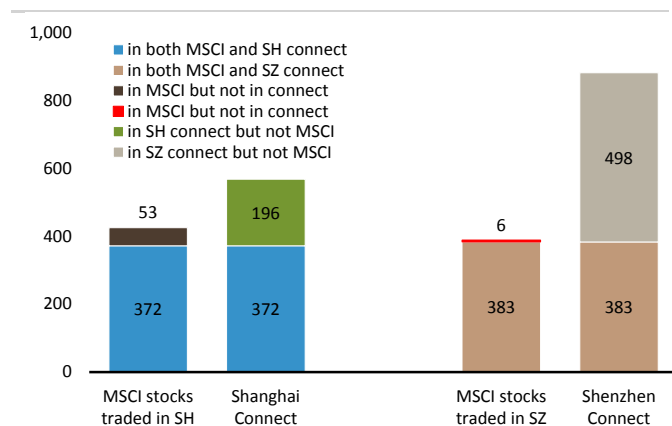
Investable universes in China's domestic market

To cater for the different investment mandates of international investors, we study the performance for three investable universes in China—the MSCI China A index, Shanghai Stock Connect and Shenzhen Stock Connect universes¹⁰.

We study the factor performance in three universes: MSCI China A, Shanghai Stock Connect and Shenzhen Stock Connect

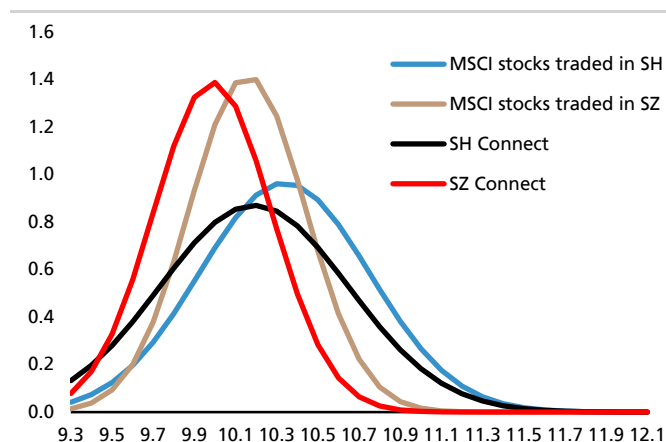
The MSCI indices have been widely used as benchmarks for international investors. Shanghai and Shenzhen Connect together cover over 90% of stocks in the MSCI China A index universe, which makes it possible for international investors to use it as an investment universe and benchmark (see Figure 28)

Figure 28: Number of overlapping stocks



Source: MSCI, Wind, UBS Quantitative Research

Figure 29: Market cap distribution



Note: X-axis displays logarithmic market caps, and y-axis is distribution density.
Source: MSCI, Wind, UBS Quantitative Research

Currently, about 35% and 57% of Shanghai and Shenzhen Connect stocks are outside the MSCI China A universe, respectively, most of which have smaller market capitalisation compared to stocks in the MSCI index (see Figure 28 and Figure 29). If investors are able to invest in the smaller segment of the market, there is plenty of alpha there to be harvested.

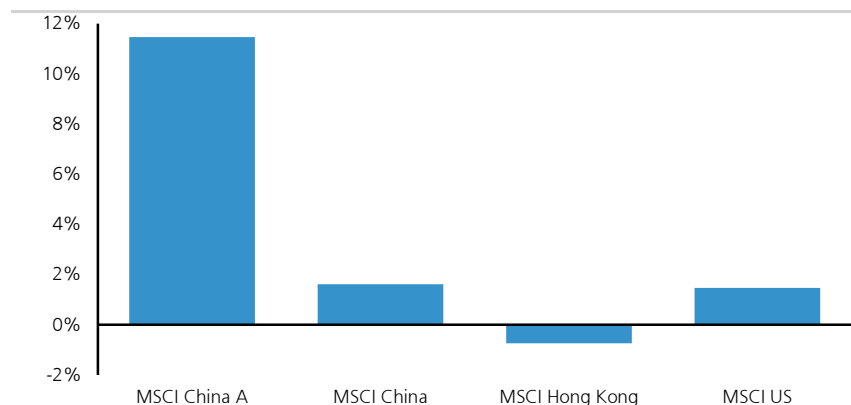
⁹ Please refer to Appendix for definition of factors and back test methodology.

¹⁰ Please refer to Appendix for the method on construction of Shanghai and Shenzhen Stock Connect universes for back test.

Size—the most dominant factor in China

We have discussed the popularity of small caps in China in a previous section. Here we show that as a factor, it has had much stronger performance in China than in other markets (see Figure 30 and Figure 31).

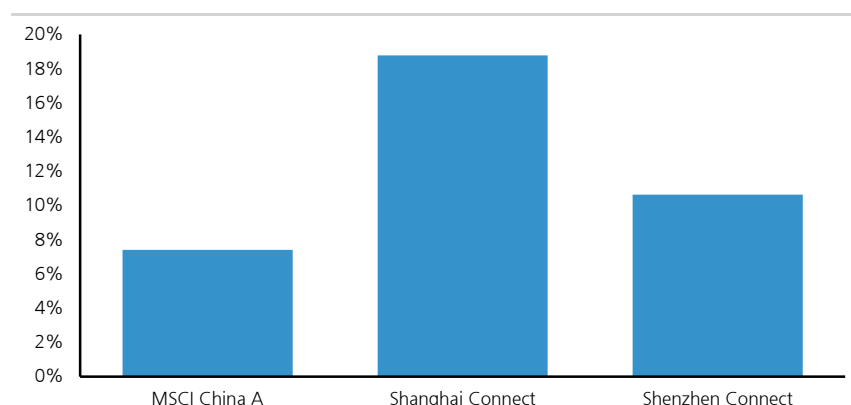
Figure 31: Small caps have performed the best in China's domestic market



Note: The chart shows the relative performance against benchmark. Performance is cap-weight and in USD. The back test is run since Jan 2006. The portfolio is rebalanced on monthly basis.
Source: FactSet, MSCI, UBS Quantitative research

Within China, its performance is quite consistent across the different universes and most sectors. Performance is relatively weak in Real estate and Utilities (see Figure 32 to Figure 36).

Figure 33: Small cap premium is ever higher for the Connect universe



Note: The chart shows the relative performance against benchmark. Performance is cap-weight and in USD. The back test is run since Oct 2011. The portfolio is rebalanced on monthly basis.
Source: FactSet, MSCI, Wind, UBS Quantitative Research

Figure 30: Size performance

	Small	Large	Small-Large
MSCI China A	11.5%	-2.4%	13.8%
	0.62	-0.44	0.59
MSCI China	1.6%	0.0%	1.6%
	0.11	0.01	0.10
MSCI HK	-0.7%	-0.3%	-0.4%
	-0.06	-0.10	-0.03
MSCI US	1.5%	0.0%	1.5%
	0.19	-0.03	0.17

Note: The table shows the annualised return (in percentage) and risk-adjusted returns since Jan 2006

Source: FactSet, MSCI, UBS Quantitative Research

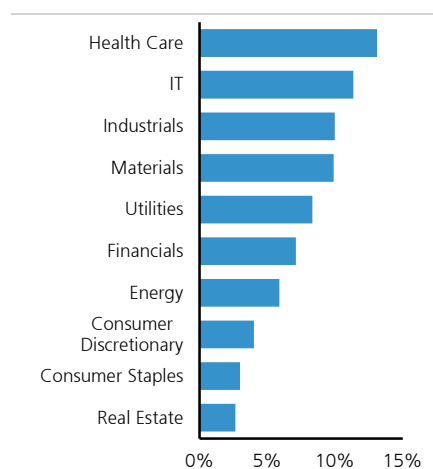
Figure 32: Size performance

	Small	Large	Small-Large
MSCI China A	7.4%	-1.4%	8.8%
	0.57	-0.28	0.49
Shanghai	18.8%	-1.3%	20.0%
Connect	0.88	-0.49	0.84
Shenzhen	10.6%	-3.7%	14.3%
Connect	0.83	-0.74	0.81

Note: The table shows the annualised return (in percentage) and risk-adjusted returns since Oct 2011

Source: FactSet, MSCI, Wind, UBS Quantitative Research

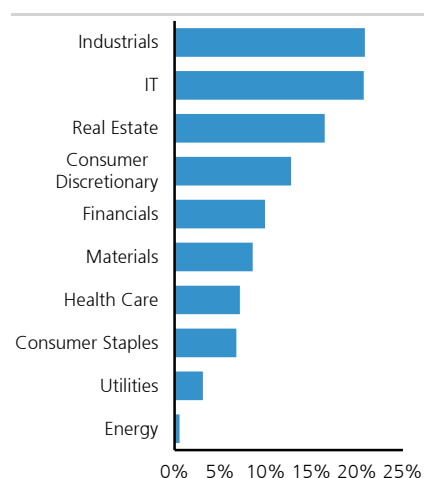
Figure 34: Small caps performance within each sector - MSCI China A



Note: The chart shows the performance since Oct 2011

Source: FactSet, MSCI, UBS Quantitative research

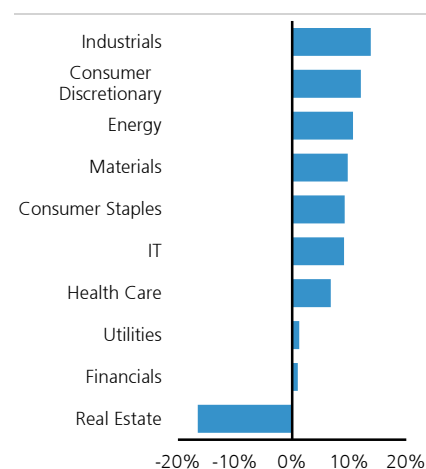
Figure 35: Small caps performance within each sector - Shanghai Connect



Note: : The chart shows the performance since Oct 2011

Source: FactSet, Wind, UBS Quantitative research

Figure 36: Small caps performance within each sector - Shenzhen Connect



Note: : The chart shows the performance since Oct 2011

Source: FactSet, Wind, UBS Quantitative research

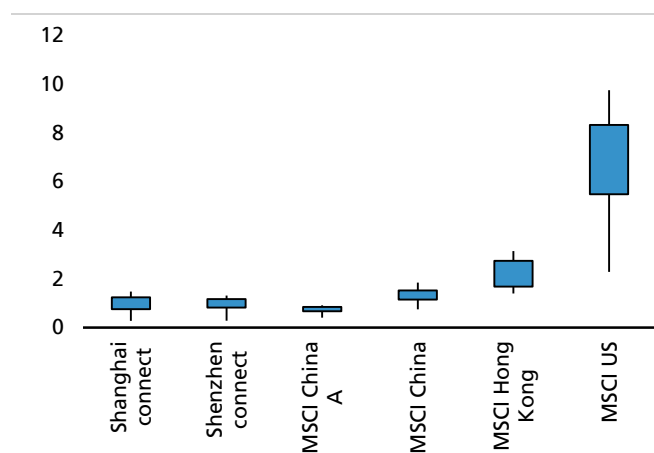
As discussed in a previous section, we believe the popularity and strong performance of small caps in China is mainly driven by investors' high expectations for the forward earnings growth of these stocks (see Figure 24).

Is the China small cap universe investable?

We compare the market cap and liquidity of the small cap universe across markets. We found that although the market caps of small-cap stocks in China are smaller compared to Hong Kong and the US, they are much more liquid. This makes it possible for investors to gain alpha from this space.

Small caps in China are more liquid than in Hong Kong and the US

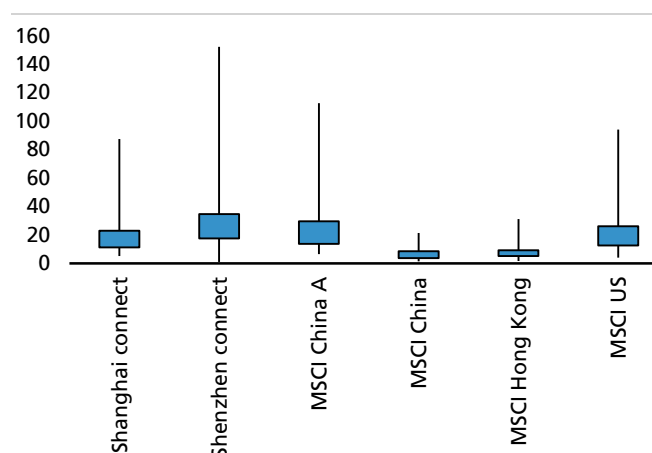
Figure 37: Market cap for small cap basket (USD bn)



Source: MSCI, Wind, UBS Quantitative research

Note: Market cap and ADVT data are as of October 2016. For the box plot, the upper end of the whisker, the top of the box, the bottom of the box and the lower end of the whisker represents the maximum, third quartile, first quartile, and the minimum values respectively.

Figure 38: 3m ADVT for small cap basket (USD m)

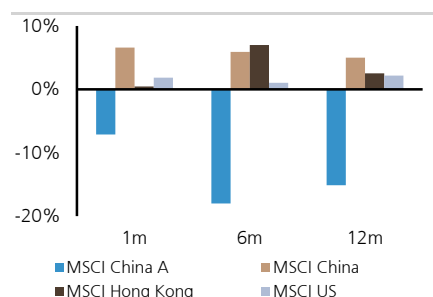


Source: Bloomberg, MSCI, Wind, UBS Quantitative research

A strong price reversal effect

The price reversal effect in China has been distinct, where previous losers tend to outperform previous winners. This has worked across different holding periods. On the opposite end, in Hong Kong and the US, price momentum works better, i.e. previous winners continue to outperform previous losers (see Figure 39 and Figure 40).

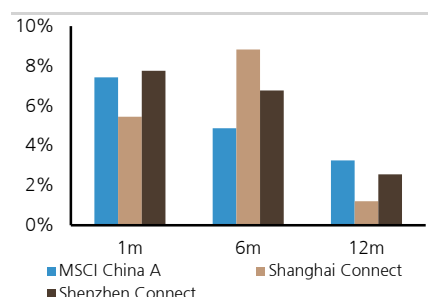
Figure 39: Performance for price momentum factor



Note: This chart shows the annualised return of high-low momentum basket over the period from Jan 2006 to Sep 2016.

Source: MSCI, FactSet, UBS Quantitative Research

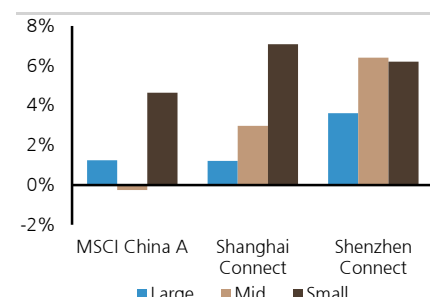
Figure 40: Performance for price reversal in China



Note: This chart shows the annualised return of low momentum relative to market over the period from Oct 2011 to Sep 2016.

Source: MSCI, Wind, UBS Quantitative Research

Figure 41: Performance of price reversal across size bands in China



Note: This chart shows the annualised return of low momentum relative to market over the period from Oct 2011 to Sep 2016.

Source: MSCI, Wind, UBS Quantitative Research

The **strong price reversal effect** would be caused by a **high proportion of retail investors** in the China domestic market, who tend to have **much shorter holding periods** than institutional investors. The median turnover on tradable shares in China's domestic market is 929% for the past 12 months, compared to 69% in Hong Kong and 209% in the US (see Figure 42). That means investors completely turnover their portfolios every five weeks on average. As a result, the price momentum effect can hardly last for more than a month. On a monthly basis, the reversal effect dominates.

High turnover results in price reversal

Figure 42: Median turnover for the last 12 months

	China	Hong Kong	US
All shares	404%	31%	181%
Tradable shares	929%	69%	209%

Note: The table shows the median turnover of all stocks in each market over the last 12 months. Turnover is calculated as total volume traded in the past 12 months divided by number of shares.

Source: Bloomberg, UBS Quantitative Research

This can also explain why the reversal effect is more pronounced in the small cap universe (see Figure 41). There are more retail investors in the small cap space, and as we have shown in a previous section, the small cap universe in China has much higher turnover (see Figure 23).

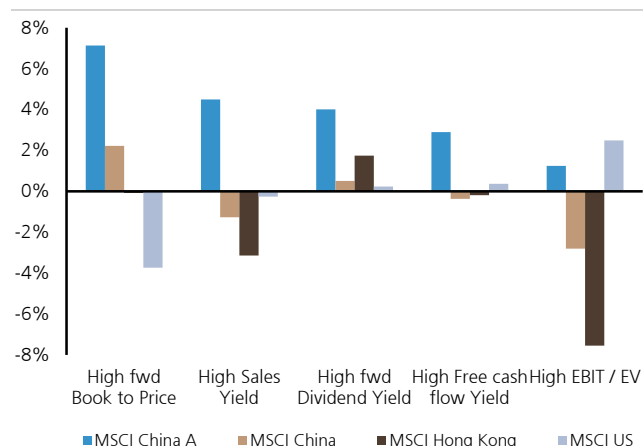
Is China's stock market driven by speculation?

We have shown in previous sections that retail investors make up the largest portion of China's stock market; small caps are more popular in China than large caps; and turnover in China's stock market is much higher than in other developed markets. So is China's stock market driven by speculation, as has been believed for a long time? We believe the answer is, no.

Value investments generate significant alpha

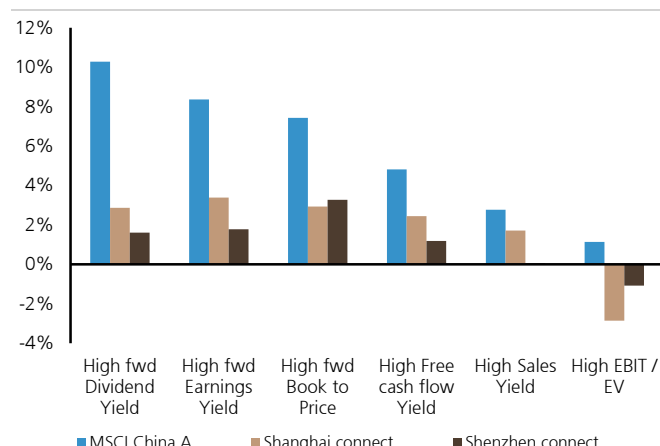
The strategy of buying stocks with lower valuations (i.e. cheap stocks) has delivered much better relative returns in China's domestic market than in Hong Kong and the US (see Figure 43).

Figure 43: Annualised performance across markets



Note: The chart shows the performance relative to benchmark since Jan 2006.
Source: MSCI, Wind, UBS Quantitative Research

Figure 44: Annualised performance in China



Note: The chart shows the performance relative to benchmark since Oct 2011.
Source: MSCI, Wind, UBS Quantitative Research

In the past decade, the performance of value factors has ridden through different cycles. They performed poorly particularly in 2009 and 2015. However, over a longer period, performance has been generally good (see Figure 45).

Figure 45: Annual relative performance for the value factor in MSCI China A

Type	Factor Name	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	YTD
Value - High	High Book / Price	25.3%	16.2%	18.9%	-10.5%	3.6%	6.1%	6.5%	0.8%	18.4%	0.1%	7.6%
	High Dividend Yield	30.0%	5.3%	2.0%	-8.6%	7.1%	6.7%	2.0%	2.0%	14.5%	0.9%	9.7%
	High Earnings Yield	31.5%	1.0%	13.7%	-7.4%	7.5%	4.8%	-0.1%	2.7%	10.5%	1.9%	8.1%
	High EBIT / EV	17.5%	-1.4%	-1.2%	6.9%	9.5%	-4.2%	-18.1%	3.4%	8.7%	-3.5%	5.5%
	High Free Cash-flow Yield	-0.6%	3.7%	1.1%	-1.5%	3.1%	3.8%	0.4%	4.7%	-1.7%	0.8%	6.1%
	High Sales Yield	8.6%	1.7%	7.3%	7.1%	3.8%	-1.7%	-1.9%	4.9%	17.3%	-2.6%	5.3%

Source: MSCI, Wind, FactSet, UBS Quantitative Research

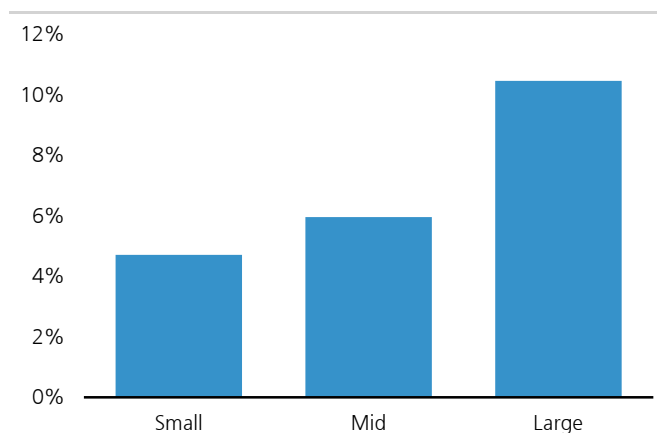
Comparing value strategies in different universes within China, the performance is strongest with the MSCI China A universe, followed by the Shanghai Connect universe. It is weakest in the Shenzhen Connect universe. To understand this difference in performance, we further dissect the value performance and we found the following.

Value strategies work better in large caps than small caps

The value spread is much larger in the large cap universe than small cap universe (see Figure 46). If we slice the universe firstly into large-, medium- and small-sized bands and re-test the performance within each size band, value strategies perform better in the large cap universe than small cap universe (see Figure 47). This is

quite different from the US market, where value performed better within small caps than large caps.

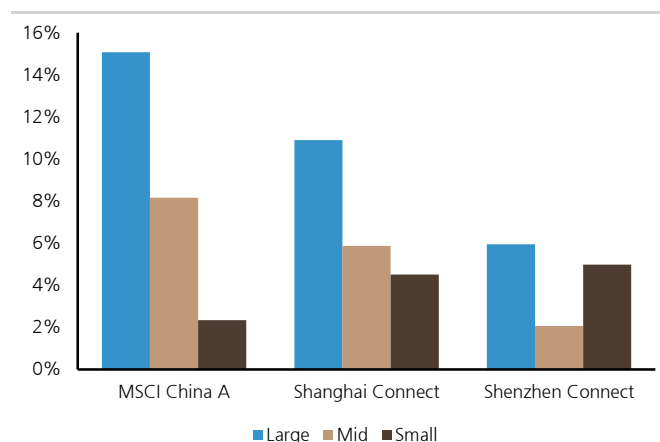
Figure 46: Earnings yield spread in different size bands



Note: Data as of end September 2016. We assign the stocks into three baskets according to their earnings yield within each size band and calculate the difference between median earnings yield between high and low earning yield baskets.

Source: Wind, UBS Quantitative Research

Figure 47: Performance gap for composite value by size



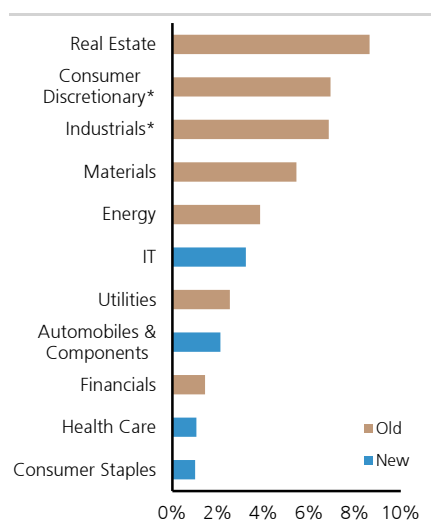
Note: The chart shows the difference in annualised performance of high and low composite value baskets. Returns cover the period from Oct 2011 to Sep 2016. The performance of composite value is calculated as the simple average of performance of forward earnings yield, forward book to price, forward dividend yield and free cash flow yield, sales yield and EBIT / EV.

Source: MSCI, FactSet, Wind, UBS Quantitative Research

Value works better in old economy sectors than new economy sectors

We run the value strategy within each sector and compare the performance. We found that in general, value strategies perform better within old economy sectors than in new economy sectors¹¹.

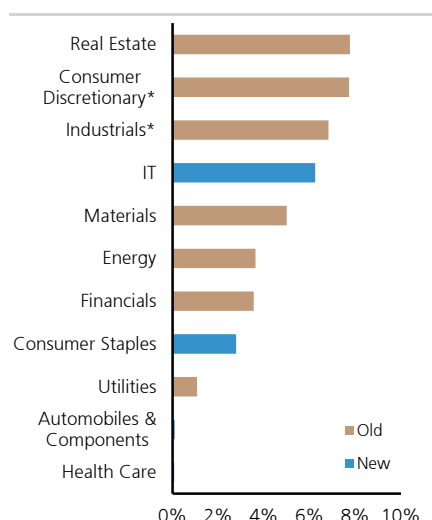
Figure 48: Performance for composite value within each sector - MSCI China A



Source: MSCI, Wind, UBS Quantitative Research

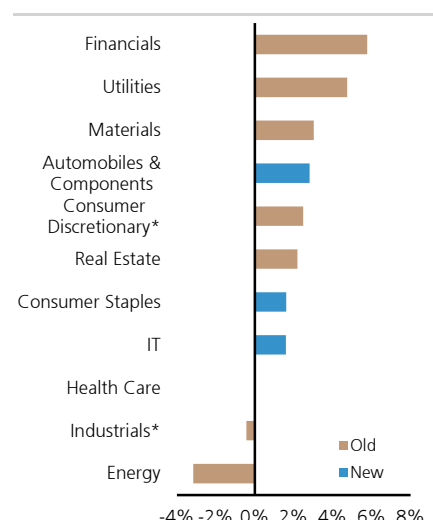
Note: The chart shows the performance of composite value baskets relative to benchmarks. Returns cover the period from Oct 2011 to Sep 2016. The performance of composite value is calculated as the simple average of performance of forward earnings yield, forward book to price, forward dividend yield and free cash flow yield, sales yield and EBIT / EV. Automobiles & components under Consumer Discretionary is considered to be new economy sector, which is removed from Consumer Discretionary sector in the back test; Commercial & professional services is considered to be new economy sector, which is removed from the industrials in the back test.

Figure 49: Performance for composite value within each sector - Shanghai Connect



Source: Wind, UBS Quantitative Research

Figure 50: Performance for composite value within each sector - Shenzhen Connect

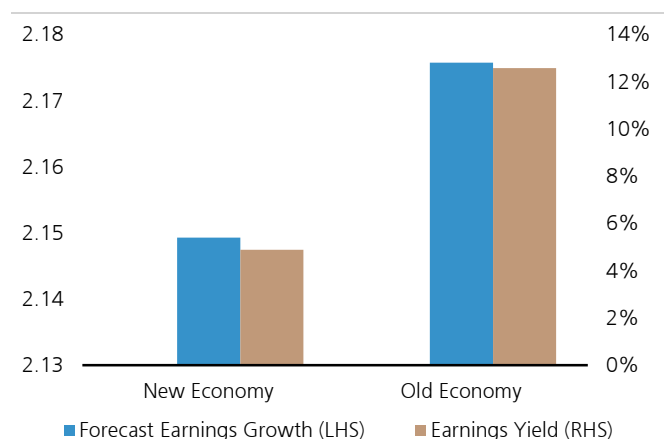


Source: Wind, UBS Quantitative Research

¹¹ For old and new economic sectors, we use the classification provided by the UBS-S China Strategy team. For more details, please see the report, China H-Share Strategy: Quantifying new vs. old economy sectors (16 April 2014).

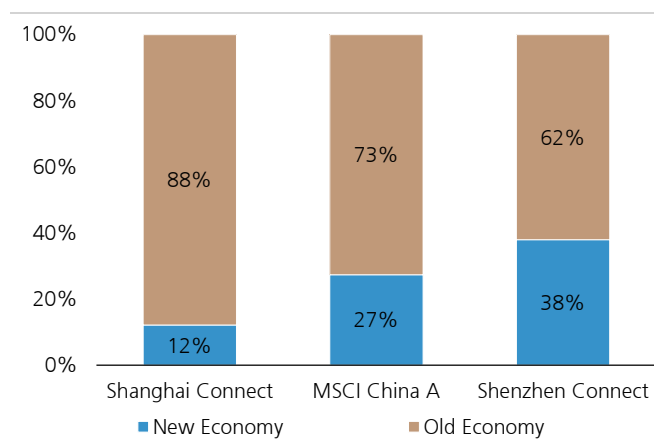
One explanation could be that forecasted earnings growth for new economy sectors is generally high. Thus, the gap in forecasted earnings growth in new economy sectors between cheap and expensive stocks is narrower than in the old economy sectors—hence, the valuation spread is also smaller in the new economy than in the old economy sectors. As a result, valuation as a measure to differentiate between outperformers and underperformers is not as efficient in the new economy as in the old economy sectors (see Figure 51).

Figure 51: Forecasted earnings growth and earnings yield spread¹²



Note: Data as of end September 2016 closing
Source: Wind, UBS Quantitative research

Figure 52: Proportion of old versus new economy sectors



Note: Data as of end September 2016 closing
Source: MSCI, Wind, UBS Quantitative research

As we have mentioned, the MSCI China A contains the larger-sized segment of the Shanghai Connect and Shenzhen Connect. In terms of sector composition, the Shenzhen Connect contains the largest proportion of new economy sectors (see Figure 52). It is not surprising to see that the value strategies do not work as well in the Shenzhen Connect universe as in the others.

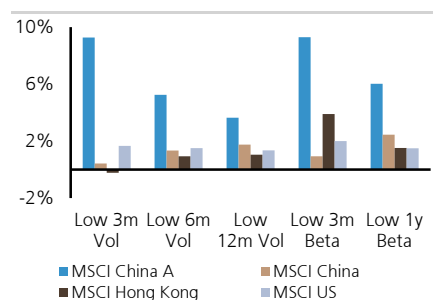
High risk does not always bring high returns

Post GFC, low volatility investments has gained significant popularity in the global markets. Although China's domestic market is relatively isolated from the rest of the world, we found that low volatility (low beta) strategies¹³ have also enjoyed very strong performance in the past decade, and have yielded much better returns than Hong Kong and the US (see Figure 53 and Figure 54).

¹² We assign the stocks into three baskets according to their earnings yield within new and old economy sectors, and calculate the difference between median forecast earnings growth and earnings yield between high and low earning yield baskets

¹³ The strategy buys stocks with low volatility (low beta) and shorts stocks with high volatility (high beta).

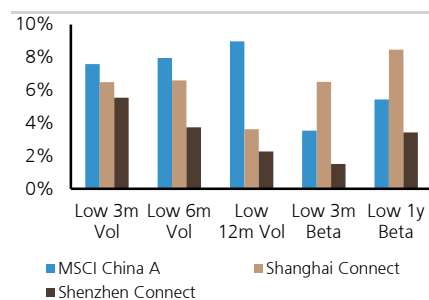
Figure 53: Performance of low-risk factors across markets



Note: This chart shows the annualised return of low risk strategies relative to market over the period from Jan 2006 to Sep 2016.

Source: FactSet, MSCI, UBS Quantitative Research

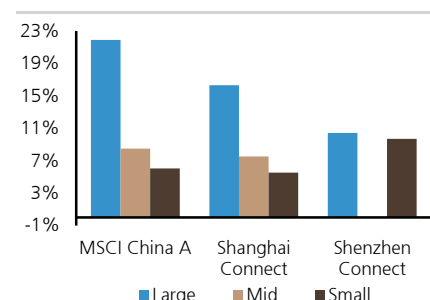
Figure 54: Performance of low-risk factors in China



Note: This chart shows the annualised return of low risk strategies relative to market over the period from Oct 2011 to Sep 2016.

Source: MSCI, Wind, UBS Quantitative Research

Figure 55: Performance spread for composite risk factor in China across size



Note: The chart shows the difference in annualised performance of low and high composite risk baskets. Returns cover the period from Oct 2011 to Sep 2016. The performance of composite risk is calculated as the simple average of 3m, 6m, 12m Vol, 3m and 1y Beta.

Source: MSCI, Wind, UBS Quantitative Research

Similar to the value strategy, the size effect also has a significant impact on the performance of a low-risk strategy. It works better with larger stocks (see Figure 55).

In a nutshell, the above findings suggest that there is price discovery for over/under-valued stocks, which leads to mean reversion and great performance for value strategies; and investors do pay up for stocks with low risk.

Summary tables of investment style performance

Figure 56: Annual factor performance—Long relative to benchmark - MSCI China A

Type	Factor Name	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	YTD
Value - High	High Book / Price	25.3%	16.2%	18.9%	-10.5%	3.6%	6.1%	6.5%	0.8%	18.4%	0.1%	7.6%
	High Dividend Yield	30.0%	5.3%	2.0%	-8.6%	7.1%	6.7%	2.0%	2.0%	14.5%	0.9%	9.7%
	High Earnings Yield	31.5%	1.0%	13.7%	-7.4%	7.5%	4.8%	-0.1%	2.7%	10.5%	1.9%	8.1%
	High EBIT / EV	17.5%	-1.4%	-1.2%	6.9%	9.5%	-4.2%	-18.1%	3.4%	8.7%	-3.5%	5.5%
	High Free Cash-flow Yield	-0.6%	3.7%	1.1%	-1.5%	3.1%	3.8%	0.4%	4.7%	-1.7%	0.8%	6.1%
Value - Low	High Sales Yield	8.6%	1.7%	7.3%	7.1%	3.8%	-1.7%	-1.9%	4.9%	17.3%	-2.6%	5.3%
	Low Book / Price	-33.1%	-2.2%	-16.4%	17.8%	-4.1%	-0.6%	-0.5%	-9.3%	-29.3%	-0.9%	-6.5%
	Low Dividend Yield	-31.6%	-3.0%	-20.0%	9.3%	-9.7%	3.5%	7.5%	-5.8%	-23.5%	1.2%	-8.3%
	Low Earnings Yield	-43.3%	0.9%	-11.4%	14.4%	-10.0%	-5.8%	4.7%	-4.8%	-23.3%	-4.1%	-12.1%
	Low EBIT / EV	9.0%	-4.9%	-5.8%	7.9%	-8.4%	-10.7%	10.3%	4.1%	-14.8%	-2.0%	-10.9%
Growth - High	Low Free Cash-flow Yield	27.9%	-1.0%	0.1%	-4.4%	-0.6%	-0.7%	-5.4%	2.1%	15.7%	-0.5%	-6.0%
	Low Sales Yield	-20.6%	-0.4%	-17.2%	0.3%	-2.3%	3.1%	2.5%	-3.7%	-10.9%	1.7%	-4.6%
	High Forecast EPS Growth	31.8%	-3.1%	0.1%	3.7%	-2.7%	-0.9%	-3.7%	2.8%	-9.9%	1.1%	-6.2%
	High Historical EPS Growth	-4.7%	-0.5%	0.4%	-2.6%	1.7%	5.4%	1.3%	-4.7%	2.6%	2.9%	4.0%
	Low Forecast EPS Growth	-16.4%	3.7%	8.1%	-8.3%	3.0%	-2.6%	0.5%	-4.2%	5.7%	-3.1%	4.9%
Growth - Low	Low Historical EPS Growth	-1.1%	2.3%	1.6%	3.2%	-3.7%	-9.3%	-7.9%	2.7%	-4.4%	-1.1%	-4.2%
	High 1m Earnings Momentum	2.3%	2.1%	3.1%	10.4%	-0.2%	-0.7%	3.0%	-1.4%	8.7%	-0.5%	2.5%
	Momentum - High	-9.6%	1.6%	-7.7%	7.6%	2.9%	4.2%	2.3%	4.1%	9.2%	1.5%	2.7%
	Earnings	15.5%	-6.0%	3.6%	-4.5%	2.1%	0.6%	-4.7%	-3.0%	-13.5%	-0.8%	3.0%
	Momentum - Low	29.4%	-7.6%	12.3%	-1.8%	-1.5%	-2.6%	-1.2%	0.9%	-13.5%	-0.9%	1.1%
Price	Low Previous 1m Performance	4.6%	7.7%	13.2%	2.5%	10.7%	12.0%	-5.8%	4.7%	-2.5%	6.5%	0.8%
	Reversal - High	43.5%	9.8%	32.7%	-5.4%	7.7%	2.9%	-6.3%	3.5%	31.7%	8.3%	-0.5%
	Low Previous 12m Performance	58.0%	6.7%	38.5%	-3.5%	3.5%	-5.1%	-21.0%	-0.3%	32.6%	9.3%	5.8%
	Price	-0.1%	1.8%	-9.9%	1.6%	-9.2%	-6.0%	10.6%	-5.3%	0.1%	-2.8%	-3.1%
	Reversal - Low	-41.1%	-3.1%	-14.5%	6.1%	-7.8%	-3.7%	9.0%	-8.8%	-21.1%	-6.6%	-2.8%
Quality - High	High Previous 12m Performance	-19.7%	-3.1%	-28.4%	14.1%	-7.1%	3.6%	9.2%	-7.8%	-28.5%	-10.6%	-6.1%
	Quality - High	3.7%	3.8%	-0.5%	6.7%	6.6%	5.3%	3.0%	-5.4%	-2.6%	3.8%	6.8%
	High ROIC	-1.6%	0.4%	-1.7%	2.5%	5.2%	2.0%	0.4%	-3.7%	-8.6%	5.7%	3.0%
	Low Capex / Depreciation	-5.1%	-2.2%	7.1%	4.5%	-2.6%	-2.5%	-5.0%	1.1%	-1.6%	-1.0%	-5.0%
	Low Debt / EV	-16.5%	1.2%	-5.6%	4.7%	1.0%	5.0%	3.4%	-2.5%	-11.2%	2.7%	-1.5%
Quality - Low	Low ROE	-0.3%	8.1%	2.2%	-1.6%	-2.7%	-4.9%	-2.2%	3.1%	14.1%	-3.6%	-5.4%
	Low ROIC	13.8%	2.2%	10.0%	-3.1%	-4.1%	-6.8%	-6.2%	4.7%	4.9%	-5.9%	-3.1%
	High Capex / Depreciation	8.2%	-1.0%	2.7%	-2.5%	1.6%	2.1%	4.7%	-2.5%	-0.9%	1.0%	2.6%
	High Debt / EV	10.1%	-2.6%	7.2%	-6.7%	0.4%	-1.6%	0.7%	0.0%	6.9%	-2.8%	0.3%
	Size	46.2%	6.5%	39.9%	25.0%	0.9%	-4.8%	1.1%	16.6%	10.9%	14.8%	2.9%
Risk - High	Large Market Cap	-10.2%	-0.1%	-8.2%	-6.9%	1.5%	2.3%	-0.6%	-5.6%	-3.1%	-3.3%	1.6%
	High Volatility 3M	-21.1%	-9.4%	20.5%	7.6%	-8.5%	-6.7%	0.6%	-6.8%	-27.0%	5.9%	-12.4%
	High Volatility 6M	5.2%	-7.9%	17.6%	6.0%	-5.0%	-9.0%	-4.0%	-6.5%	-30.0%	3.5%	-9.1%
	High Volatility 12M	27.4%	-9.2%	24.8%	6.1%	-4.0%	-8.4%	-7.1%	-3.7%	-39.6%	2.8%	-9.2%
	High Beta 3M	-4.1%	-7.1%	3.8%	-2.8%	1.5%	-5.3%	-9.1%	-0.6%	-6.2%	4.1%	-5.6%
Risk - Low	High Beta 1Y	-17.6%	-2.2%	16.9%	-9.4%	4.5%	-5.6%	-15.6%	0.2%	-13.1%	4.7%	-6.8%
	Low Volatility 3M	21.1%	9.4%	-0.6%	-3.9%	4.3%	4.7%	4.5%	5.3%	33.4%	-0.7%	7.0%
	Low Volatility 6M	-2.9%	8.1%	-20.1%	-3.6%	4.3%	5.6%	5.2%	6.4%	35.5%	-3.0%	6.4%
	Low Volatility 12M	-13.9%	8.1%	-21.9%	-3.8%	2.0%	5.4%	2.3%	4.9%	28.8%	-2.6%	6.7%
	Low Beta 3M	-1.7%	10.6%	-6.8%	6.2%	3.8%	5.7%	8.6%	1.1%	22.4%	-4.7%	5.9%
	Low Beta 1Y	12.0%	6.8%	-15.6%	9.9%	0.1%	5.4%	13.9%	-1.1%	27.6%	-3.4%	5.3%

Note: This figure shows the style performance of high and low baskets, relative to the index benchmark.

Source: FactSet, MSCI, Wind, UBS Quantitative Research

Figure 57: Annual factor performance—Long short - in MSCI China A

Type	Factor Name	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	YTD
Value	Book / Price	58.3%	18.3%	35.3%	-28.3%	7.7%	6.7%	7.1%	10.1%	47.6%	1.0%	14.1%
	Dividend Yield	61.7%	8.2%	22.0%	-17.9%	16.8%	3.2%	-5.5%	7.9%	38.0%	-0.3%	18.0%
	Earnings Yield	74.8%	0.0%	25.1%	-21.7%	17.5%	10.6%	-4.7%	7.5%	33.8%	6.0%	20.2%
	EBIT / EV	8.4%	3.5%	4.6%	-1.0%	17.8%	6.4%	-28.4%	-0.7%	23.5%	-1.5%	16.4%
	Free Cash-flow Yield	-28.5%	4.7%	1.1%	3.0%	3.7%	4.5%	5.7%	2.5%	-17.4%	1.4%	12.1%
Growth	Sales Yield	29.2%	2.1%	24.4%	6.7%	6.2%	-4.8%	-4.3%	8.6%	28.2%	-4.2%	9.9%
	Forecast EPS Growth	48.2%	-6.8%	-8.0%	12.0%	-5.7%	1.7%	-4.2%	7.0%	-15.6%	4.3%	-11.1%
	Historical EPS Growth	-3.5%	-2.8%	-1.1%	-5.9%	5.4%	14.7%	9.2%	-7.4%	7.0%	3.9%	8.2%
	1m Earnings Momentum	-13.1%	8.1%	-0.5%	14.9%	-2.3%	-1.3%	7.6%	1.6%	22.2%	0.4%	-0.5%
	3m Earnings Momentum	-39.0%	9.2%	-20.1%	9.4%	4.4%	6.8%	3.5%	3.2%	22.7%	2.4%	1.6%
Price	1m Price Reversal	4.7%	5.9%	23.1%	1.0%	19.9%	18.0%	-16.5%	10.0%	-2.6%	9.3%	3.9%
	6m Price Reversal	84.6%	12.9%	47.2%	-11.5%	15.4%	6.6%	-15.3%	12.4%	52.8%	14.9%	2.3%
	12m Price Reversal	77.7%	9.8%	66.9%	-17.7%	10.6%	-8.7%	-30.2%	7.4%	61.1%	19.9%	11.9%
	Quality	4.1%	-4.2%	-2.8%	8.3%	9.3%	10.2%	5.1%	-8.5%	-16.7%	7.5%	12.2%
	ROIC	-15.4%	-1.7%	-11.7%	5.7%	9.3%	8.8%	6.5%	-8.4%	-13.6%	11.6%	6.1%
Quality	Capex / Depreciation*	-13.3%	-1.2%	4.5%	7.0%	-4.1%	-4.6%	-9.7%	3.6%	-1.0%	-2.0%	-7.6%
	Debt / EV*	-26.5%	3.8%	-12.8%	11.4%	0.6%	6.7%	2.7%	-2.4%	-18.1%	5.5%	-1.8%
	Size	56.4%	6.7%	48.1%	32.0%	-0.6%	-7.1%	1.7%	22.2%	14.0%	18.2%	1.2%
	Risk	42.2%	18.8%	-21.0%	-11.5%	12.9%	11.5%	3.9%	12.2%	60.4%	-6.6%	19.4%
	Volatility 3M*	-8.1%	16.0%	-37.8%	-9.6%	9.3%	14.7%	9.2%	12.9%	65.5%	-6.5%	15.6%
Risk	Volatility 6M*	-41.3%	17.4%	-46.7%	-9.9%	6.0%	13.7%	9.3%	8.6%	68.4%	-5.4%	15.9%
	Volatility 12M*	2.5%	17.7%	-10.6%	9.0%	2.3%	11.0%	17.7%	1.7%	28.7%	-8.7%	11.5%
	Beta 3M*	29.6%	9.0%	-32.6%	19.3%	-4.4%	11.0%	29.4%	-1.3%	40.7%	-8.1%	12.1%
	Beta 1Y*											

Note: The factor performance is calculated using the cap-weighted return of high basket minus low basket, except for the ones with asterisk, where the performance is calculated using low minus high

Source: FactSet, MSCI, Wind, UBS Quantitative Research

Figure 58: Annual factor performance—Long relative to benchmark - Shanghai Connect

Type	Factor Name	2011	2012	2013	2014	2015	YTD
Value - High	High Book / Price	0.5%	4.5%	-1.0%	4.4%	-1.5%	4.7%
	High Dividend Yield	0.9%	0.6%	-0.9%	2.9%	-0.7%	7.7%
	High Earnings Yield	0.3%	1.5%	0.8%	6.6%	1.1%	4.9%
	High EBIT / EV	2.1%	-10.9%	2.6%	-1.1%	-4.4%	2.3%
	High Free Cash-flow Yield	0.9%	3.0%	4.0%	-1.3%	-1.8%	4.5%
	High Sales Yield	-0.1%	-4.9%	3.3%	13.2%	-2.6%	4.2%
Value - Low	Low Book / Price	3.2%	2.7%	-5.2%	-29.9%	1.3%	-7.3%
	Low Dividend Yield	-1.5%	3.5%	-0.4%	-21.3%	4.6%	-10.2%
	Low Earnings Yield	-0.6%	3.2%	-2.8%	-26.9%	-1.4%	-14.6%
	Low EBIT / EV	-5.2%	14.4%	9.1%	-12.9%	2.1%	-12.1%
	Low Free Cash-flow Yield	-3.0%	-1.5%	0.6%	10.9%	5.5%	-7.4%
	Low Sales Yield	0.0%	4.2%	0.8%	-9.0%	5.1%	-5.1%
Growth - High	High Forecast EPS Growth	1.5%	-9.0%	6.4%	-11.5%	6.2%	-4.9%
	High Historical EPS Growth	-0.8%	5.4%	0.0%	4.1%	3.9%	3.1%
Growth - Low	Low Forecast EPS Growth	0.3%	1.2%	-2.2%	-4.2%	-2.6%	2.5%
	Low Historical EPS Growth	1.7%	-6.2%	1.2%	-7.6%	-3.8%	-1.8%
Earnings	1m Earnings Momentum	-2.3%	-2.1%	-2.3%	12.0%	-1.2%	1.2%
Momentum - High	3m Earnings Momentum	0.7%	2.0%	5.6%	16.3%	2.1%	-0.6%
Earnings	1m Earnings Momentum	0.3%	3.7%	0.2%	-13.1%	-2.3%	5.0%
Momentum - Low	3m Earnings Momentum	-1.9%	5.5%	-2.4%	-14.5%	-2.8%	2.3%
Price Reversal - High	Previous 1m Performance	2.6%	5.8%	0.3%	-1.2%	8.0%	0.5%
	Previous 6m Performance	3.2%	6.6%	8.4%	25.2%	6.4%	0.4%
	Previous 12m Performance	-2.7%	-12.4%	0.0%	26.5%	3.5%	2.3%
Price Reversal - Low	Previous 1m Performance	-0.8%	4.2%	-4.3%	-0.4%	-0.2%	-7.7%
	Previous 6m Performance	-3.8%	4.7%	-11.1%	-19.3%	-2.9%	-3.1%
	Previous 12m Performance	1.0%	4.3%	-9.1%	-21.2%	-5.6%	-5.8%
Quality - High	High ROE	0.1%	1.2%	-3.3%	-4.3%	2.1%	6.6%
	High ROIC	1.6%	-1.5%	-0.7%	-5.4%	1.9%	2.5%
	Low Capex / Depreciation	-1.8%	8.2%	6.1%	7.9%	-0.7%	-1.9%
	Low Debt / EV	2.9%	-1.7%	4.0%	5.9%	6.8%	-1.7%
Quality - Low	Low ROE	-2.9%	2.9%	4.1%	1.0%	-5.1%	-2.0%
	Low ROIC	-2.7%	-6.4%	5.7%	7.1%	-3.1%	-2.6%
	High Capex / Depreciation	-0.9%	3.4%	-0.2%	-3.2%	2.9%	2.7%
	High Debt / EV	-3.2%	5.1%	-3.0%	8.8%	-1.0%	1.6%
Size	Small Market Cap	-0.5%	26.6%	32.0%	26.1%	21.1%	1.0%
	Large Market Cap	0.4%	-2.0%	-3.0%	-1.3%	-2.6%	0.8%
Risk - High	High Volatility 3M	-2.4%	5.5%	-6.8%	-19.6%	7.8%	-15.0%
	High Volatility 6M	-2.5%	-0.6%	-5.9%	-24.7%	3.8%	-12.0%
	High Volatility 12M	-2.7%	-3.8%	-2.0%	-31.3%	2.8%	-10.0%
	High Beta 3M	-0.9%	-2.1%	-3.2%	-8.0%	5.1%	-10.0%
	High Beta 1Y	-0.1%	-8.0%	-2.5%	-6.2%	3.1%	-9.4%
Risk - Low	Low Volatility 3M	0.8%	2.0%	2.4%	25.6%	-1.9%	4.8%
	Low Volatility 6M	0.7%	0.2%	2.6%	30.3%	-1.8%	3.7%
	Low Volatility 12M	-0.2%	-1.2%	1.4%	13.2%	-2.0%	4.7%
	Low Beta 3M	1.6%	0.7%	-0.7%	35.9%	-2.8%	4.5%
	Low Beta 1Y	1.0%	4.6%	-0.9%	44.7%	-1.3%	4.0%

Note: This figure shows the style performance of high and low baskets, relative to index benchmark

Source: FactSet, Wind, UBS Quantitative Research

Figure 59: Annual factor performance—Long short - Shanghai Connect

Type	Factor Name	2011	2012	2013	2014	2015	YTD
Value	Book / Price	-2.7%	1.8%	4.2%	34.3%	-2.8%	12.0%
	Dividend Yield	2.4%	-2.9%	-0.5%	24.2%	-5.3%	17.9%
	Earnings Yield	0.8%	-1.7%	3.6%	33.6%	2.5%	19.5%
	EBIT / EV	7.3%	-25.2%	-6.6%	11.8%	-6.5%	14.5%
	Free Cash-flow Yield	3.9%	4.5%	3.4%	-12.1%	-7.3%	11.9%
	Sales Yield	-0.1%	-9.1%	2.5%	22.1%	-7.7%	9.3%
Growth	Forecast EPS Growth	1.2%	-10.3%	8.7%	-7.3%	8.8%	-7.5%
	Historical EPS Growth	-2.4%	11.6%	-1.2%	11.7%	7.7%	4.8%
Earnings	1m Earnings Momentum	-2.6%	-5.9%	-2.6%	25.1%	1.1%	-3.8%
Momentum	3m Earnings Momentum	2.6%	-3.4%	8.0%	30.9%	4.9%	-2.9%
Price	1m Price Reversal	3.4%	1.6%	4.6%	-0.8%	8.2%	8.2%
	6m Price Reversal	6.9%	1.9%	19.5%	44.5%	9.3%	3.6%
Reversal	12m Price Reversal	-3.7%	-16.7%	9.2%	47.8%	9.0%	8.1%
Quality	ROE	3.0%	-1.6%	-7.4%	-5.3%	7.2%	8.6%
	ROIC	4.4%	4.8%	-6.3%	-12.5%	5.0%	5.1%
	Capex / Depreciation*	-0.9%	4.8%	6.3%	11.1%	-3.5%	-4.6%
	Debt / EV*	6.2%	-6.7%	7.0%	-2.9%	7.8%	-3.3%
Size	Market Cap*	-0.9%	28.6%	34.9%	27.4%	23.7%	0.2%
Risk	Volatility 3M*	3.2%	-3.5%	9.2%	45.2%	-9.7%	19.7%
	Volatility 6M*	3.2%	0.8%	8.4%	55.0%	-5.6%	15.6%
	Volatility 12M*	2.5%	2.6%	3.5%	44.5%	-4.8%	14.6%
	Beta 3M*	2.5%	2.7%	2.5%	43.9%	-7.9%	14.5%
	Beta 1Y*	1.2%	12.6%	1.6%	50.9%	-4.3%	13.4%

Note: The factor performance is calculated using the cap-weighted return of high basket minus low basket, except for the ones with asterisk, where the performance is calculated using low minus high

Source: FactSet, Wind, UBS Quantitative Research

Figure 60: Annual factor performance—Long relative to benchmark - Shenzhen Connect

Type	Factor Name	2011	2012	2013	2014	2015	YTD
Value - High	High Book / Price	-3.2%	-8.3%	2.9%	3.6%	5.5%	8.5%
	High Dividend Yield	-1.8%	-15.6%	-4.0%	7.1%	4.5%	11.1%
	High Earnings Yield	-2.8%	-16.4%	-1.1%	7.3%	5.8%	11.6%
	High EBIT / EV	-1.1%	-18.8%	0.0%	4.1%	-0.9%	10.1%
	High Free Cash-flow Yield	0.4%	-9.6%	1.9%	0.9%	2.2%	5.5%
	High Sales Yield	-2.0%	-7.4%	0.8%	4.8%	2.0%	4.0%
Value - Low	Low Book / Price	4.5%	16.4%	-11.4%	-14.9%	-4.2%	-11.5%
	Low Dividend Yield	4.6%	20.9%	-12.8%	-11.9%	-1.6%	-7.9%
	Low Earnings Yield	2.0%	21.1%	-1.5%	-7.6%	-6.1%	-12.6%
	Low EBIT / EV	-0.4%	18.2%	5.5%	-4.3%	-7.2%	-8.7%
	Low Free Cash-flow Yield	-2.1%	-4.9%	2.8%	6.1%	-1.5%	-3.3%
	Low Sales Yield	2.6%	12.8%	-2.7%	-3.0%	-0.6%	-9.6%
Growth - High	High Forecast EPS Growth	0.4%	12.4%	3.3%	2.7%	0.6%	-3.0%
	High Historical EPS Growth	1.7%	-3.3%	-8.5%	10.4%	-2.3%	0.4%
Growth - Low	Low Forecast EPS Growth	-1.9%	-11.8%	-4.6%	0.3%	2.6%	4.1%
	Low Historical EPS Growth	-1.0%	-9.3%	2.2%	-10.5%	-2.6%	-1.8%
Earnings	1m Earnings Momentum	1.8%	16.5%	-7.8%	-0.6%	1.4%	2.4%
Momentum - High	3m Earnings Momentum	2.0%	6.8%	-4.3%	6.8%	1.6%	4.8%
Earnings	1m Earnings Momentum	-1.7%	-8.8%	-8.1%	-14.6%	5.9%	-2.4%
Momentum - Low	3m Earnings Momentum	1.3%	-1.7%	-1.3%	-15.2%	2.0%	-2.7%
Price	Previous 1m Performance	-0.1%	-12.2%	8.0%	17.7%	5.4%	6.2%
Reversal - High	Previous 6m Performance	-1.0%	-19.5%	2.5%	29.2%	12.2%	4.5%
	Previous 12m Performance	-2.6%	-21.3%	-0.7%	26.9%	13.2%	6.9%
Price	Previous 1m Performance	0.3%	20.2%	-11.7%	-12.4%	-10.1%	-1.9%
Reversal - Low	Previous 6m Performance	1.0%	20.5%	-10.3%	-21.3%	-12.5%	-3.5%
	Previous 12m Performance	2.7%	23.7%	-6.2%	-24.7%	-13.8%	-9.1%
Quality - High	High ROE	1.4%	1.7%	-11.2%	2.9%	3.5%	5.1%
	High ROIC	1.6%	5.2%	-8.5%	0.7%	-0.9%	4.8%
	Low Capex / Depreciation	0.2%	-14.1%	-1.0%	0.8%	-0.4%	-2.1%
	Low Debt / EV	3.9%	5.6%	-5.3%	-3.2%	2.3%	-1.0%
Quality - Low	Low ROE	-0.1%	-9.2%	4.9%	-4.8%	-1.1%	-3.7%
	Low ROIC	-2.3%	-4.4%	8.8%	-0.4%	-4.7%	-1.4%
	High Capex / Depreciation	-0.2%	8.9%	0.2%	-0.4%	-2.6%	0.0%
	High Debt / EV	-2.2%	-7.7%	-3.5%	-1.9%	0.0%	1.8%
Size	Small Market Cap	-0.2%	14.2%	27.3%	4.0%	15.7%	1.5%
	Large Market Cap	0.0%	-5.6%	-9.0%	-1.1%	-5.7%	0.3%
Risk - High	High Volatility 3M	-1.4%	17.1%	-6.5%	-13.0%	8.3%	-9.9%
	High Volatility 6M	-0.6%	13.0%	-6.7%	-13.9%	9.1%	-5.3%
	High Volatility 12M	0.3%	7.6%	-7.9%	-15.2%	9.9%	-8.5%
	High Beta 3M	-2.2%	-16.8%	8.1%	-4.6%	8.8%	-4.4%
	High Beta 1Y	-2.1%	-19.4%	-0.5%	-0.1%	11.9%	-5.5%
Risk - Low	Low Volatility 3M	0.3%	-3.6%	1.1%	16.6%	-2.7%	9.4%
	Low Volatility 6M	0.7%	-4.4%	0.5%	22.1%	-9.7%	5.4%
	Low Volatility 12M	-0.1%	-6.8%	0.8%	14.6%	-9.7%	7.0%
	Low Beta 3M	1.8%	13.7%	-4.3%	-2.3%	-10.1%	4.0%
	Low Beta 1Y	2.3%	14.0%	-6.8%	8.0%	-10.2%	3.7%

Note: This figure shows the style performance of high and low baskets, relative to index benchmark
Source: FactSet, Wind, UBS Quantitative Research

Figure 61: Annual factor performance—Long short - Shenzhen Connect

Type	Factor Name	2011	2012	2013	2014	2015	YTD
Value	Book / Price	-7.6%	-24.7%	14.3%	18.6%	9.7%	20.0%
	Dividend Yield	-6.4%	-36.5%	8.8%	19.0%	6.2%	19.0%
	Earnings Yield	-4.8%	-37.5%	0.4%	14.9%	11.9%	24.2%
	EBIT / EV	-0.6%	-37.0%	-5.5%	8.4%	6.3%	18.8%
	Free Cash-flow Yield	2.5%	-4.7%	-0.9%	-5.2%	3.7%	8.8%
	Sales Yield	-4.6%	-20.2%	3.5%	7.7%	2.7%	13.6%
Growth	Forecast EPS Growth	2.3%	24.2%	7.9%	2.4%	-2.0%	-7.1%
	Historical EPS Growth	2.7%	6.0%	-10.7%	20.9%	0.3%	2.2%
Earnings	1m Earnings Momentum	3.6%	25.3%	0.3%	14.0%	-4.5%	4.8%
Momentum	3m Earnings Momentum	0.6%	8.4%	-3.0%	22.0%	-0.4%	7.4%
Price	1m Price Reversal	-0.4%	-32.5%	19.7%	30.1%	15.5%	8.1%
Reversal	6m Price Reversal	-2.0%	-40.0%	12.8%	50.5%	24.7%	7.9%
	12m Price Reversal	-5.3%	-44.9%	5.5%	51.6%	27.0%	16.0%
Quality	ROE	1.5%	10.9%	-16.0%	7.7%	4.6%	8.8%
	ROIC	4.0%	9.6%	-17.3%	1.1%	3.8%	6.3%
	Capex / Depreciation*	0.4%	-23.1%	-1.2%	1.2%	2.2%	-2.2%
	Debt / EV*	6.0%	13.3%	-1.8%	-1.3%	2.3%	-2.8%
Size	Market Cap*	-0.2%	19.7%	36.3%	5.2%	21.4%	1.2%
Risk	Volatility 3M*	1.7%	-20.6%	7.6%	29.6%	-11.0%	19.3%
	Volatility 6M*	1.3%	-17.3%	7.2%	36.0%	-18.7%	10.8%
	Volatility 12M*	-0.3%	-14.4%	8.7%	29.8%	-19.6%	15.5%
	Beta 3M*	4.0%	30.4%	-12.4%	2.4%	-18.9%	8.4%
	Beta 1Y*	4.4%	33.4%	-6.3%	8.1%	-22.2%	9.2%

Note: The factor performance is calculated using the cap-weighted return of high basket minus low basket, except for the ones with asterisk, where the performance is calculated using low minus high
Source: FactSet, Wind, UBS Quantitative Research

Figure 62: Average monthly two-way turnovers

		MSCI USA	MSCI Hong Kong	MSCI China	MSCI China A	Shanghai Connect	Shenzhen Connect
Value - High	High Book / Price	17%	13%	31%	25%	16%	23%
	High Dividend Yield	9%	24%	21%	26%	12%	25%
	High Earnings Yield	19%	33%	24%	23%	17%	19%
	High EBIT / EV	20%	27%	17%	17%	7%	17%
	High Free Cash-flow Yield	21%	23%	14%	20%	15%	18%
	High Sales Yield	13%	13%	17%	16%	14%	12%
Value - Low	Low Book / Price	12%	14%	20%	30%	26%	24%
	Low Dividend Yield	10%	22%	18%	34%	44%	41%
	Low Earnings Yield	25%	25%	22%	30%	27%	33%
	Low EBIT / EV	19%	23%	17%	20%	15%	21%
	Low Free Cash-flow Yield	21%	19%	25%	23%	27%	23%
	Low Sales Yield	10%	11%	19%	13%	12%	15%
Growth - High	High Forecast EPS Growth	23%	24%	30%	34%	39%	39%
	High Historical EPS Growth	14%	16%	18%	13%	15%	14%
Growth - Low	Low Forecast EPS Growth	25%	19%	30%	30%	26%	31%
	Low Historical EPS Growth	16%	17%	15%	16%	9%	20%
Earnings Momentum - High	High 1m Earnings Momentum	110%	105%	106%	110%	126%	115%
	High 3m Earnings Momentum	46%	55%	57%	63%	83%	64%
Earnings Momentum - Low	Low 1m Earnings Momentum	111%	119%	124%	130%	137%	128%
	Low 3m Earnings Momentum	56%	68%	71%	77%	92%	75%
Price Reversal - High	Low Previous 1m Performance	142%	148%	153%	151%	157%	145%
	Low Previous 6m Performance	64%	72%	79%	76%	84%	68%
	Low Previous 12m Performance	47%	55%	60%	58%	62%	49%
Price Reversal - Low	High Previous 1m Performance	140%	136%	141%	135%	145%	140%
	High Previous 6m Performance	59%	60%	63%	62%	71%	60%
	High Previous 12m Performance	41%	38%	48%	45%	50%	45%
Quality - High	High ROE	8%	12%	11%	18%	13%	13%
	High ROIC	6%	14%	14%	14%	21%	9%
	Low Capex / Depreciation	10%	11%	19%	14%	14%	15%
	Low Debt / EV	5%	8%	9%	8%	3%	10%
Quality - Low	Low ROE	13%	12%	16%	27%	22%	26%
	Low ROIC	9%	13%	21%	20%	26%	16%
	High Capex / Depreciation	8%	13%	13%	15%	14%	16%
	High Debt / EV	6%	9%	7%	11%	11%	12%
Size	Large caps	2%	21%	5%	8%	3%	8%
	Small caps	12%	18%	26%	27%	20%	42%
Risk - High	High Volatility 3M	41%	50%	56%	53%	55%	54%
	High Volatility 6M	26%	32%	36%	35%	34%	37%
	High Volatility 12M	16%	20%	25%	22%	24%	26%
	High Beta 3M	46%	41%	55%	58%	59%	57%
	High Beta 1Y	25%	24%	33%	35%	39%	33%
Risk - Low	Low Volatility 3M	27%	36%	27%	42%	26%	44%
	Low Volatility 6M	17%	21%	17%	27%	20%	28%
	Low Volatility 12M	10%	14%	11%	15%	10%	18%
	Low Beta 3M	40%	40%	62%	50%	31%	51%
	Low Beta 1Y	21%	26%	35%	31%	25%	31%

Note: For MSCI USA, MSCI Hong Kong, MSCI China, MSCI China A, it is calculated over the period from Feb 2006 to Sep 2016. For Shanghai and Shenzhen Connect, it is calculated over the period from Nov 2011 to Sep 2015.
Source: MSCI, FactSet, Wind, UBS Quantitative Research

Appendix

Description of factors

Style portfolios are formed by assigning stocks in a representative universe into three baskets—high, medium and low, according to respective factors such as market capitalisation, book-to-price ratio, and dividend yield. Style performance is calculated as the difference between high and low baskets (typically high minus low, or indicated by an asterisk (*) if low minus high). Portfolio returns are free-float market capitalisation-weighted and rebalanced on a monthly basis.

We focus on representative factors in different styles, including value, growth, momentum, quality, size and risk. We calculated the factors in the direction that we thought was the most intuitive. For example, institutional investors typically prefer cheaper stocks to more expensive stocks, so we calculate the Book to Price factor as high minus low. On the other hand, we felt most investors tend to prefer less volatile stocks to more volatile stocks, and so computed the Volatility factor as low minus high.

Figure 63: Factor definitions

Type	Name	Definition
Value	Book / Price	The inverse of the 12m forward P/BV multiple
	Dividend Yield	The 12m forward dividend yield
	Earnings Yield	The inverse of the 12m forward PE multiple
	EBIT / EV	EBIT / EV
	Free Cash-flow Yield	Free cash flow / market capitalisation
	Sales Yield	Sales / EV
Growth	Forecast EPS Growth	The percentage change of the 12m forward EPS over the 12m trailing EPS
	Historical EPS Growth	The average EPS growth in the trailing 5 years
Earnings Momentum	1M Earnings Momentum	The percentage change in forecast EPS over the previous month
	3M Earnings Momentum	The percentage change in forecast EPS over the previous 3 months
Price Reversal	1M Price Reversal	The month's local price return, for the 'current' month-end
	6M Price Reversal	The -6m to 'current' local price return, for the 'current' month-end
	12M Price Reversal	The -12m to 'current' local price return, for the 'current' month-end
Quality	ROE	The 12m forward Earnings Yield / Book to Price
	ROIC	EBIT / Invested Capital
	Capex / Depreciation	Capital Expenditure / Depreciation
	Debt / EV	Net debt / EV
Size	Market Capitalisation	The month-end free-float market cap
Risk	Volatility 3M	Volatility of daily total returns on trading days over the past 3 months
	Volatility 6M	Volatility of daily total returns on trading days over the past 6 months
	Volatility 12M	Volatility of daily total returns on trading days over the past 12 months
	Beta 3M	Average Beta over the past 3 months
	Beta 1Y	Average Beta over the past 12 months

Source: UBS Quantitative Research

Construction of historical Shanghai and Shenzhen Stock Connect universes

Shanghai-HK Stock Connect has been available since 2014, and Shenzhen-HK Connect will be available by the end of 2016. Therefore, we conduct the back test according to the component criteria as released by Shanghai and Shenzhen Stock

exchanges. For Shanghai Connect, we adopt the universe that combines the SSE Constituent Index (SSE180), SSE 380 Index, and A-H dual-listed stocks, excluding ST-related or B-share stocks. For Shenzhen Connect, the universe is a combination of the SZSE Component Index, SZSE Small-Medium Cap Innovation, and A-H dual lists (the components in the first two indexes are the same as components in the SZSE 1000 Index). Specifically, we further rule out the lowest 30% market caps in our universe, due to an official Rmb6bn threshold for firm sizes for Shenzhen Connect.

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Buy	FSR is > 6% above the MRA.	45%	28%
Neutral	FSR is between -6% and 6% of the MRA.	39%	25%
Sell	FSR is > 6% below the MRA.	15%	17%
Short-Term Rating	Definition	Coverage ³	IB Services ⁴
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

Source: UBS. Rating allocations are as of 30 September 2016.

1: Percentage of companies under coverage globally within the 12-month rating category.

2: Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

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