Quantitative Monographs
Who is the smart money in China?

Equities
China
Quantitative

Investor landscape and idiosyncratic opportunities
It has been long hypothesised that there are ample stock opportunities available in the China A-share market due to high retail investor participation. We highlight that stock returns dispersion had been consistently higher in China than international markets, making it an environment that should favour stock pickers. As the China A-share market remains largely underexplored, we believe more idiosyncratic opportunities are available to sophisticated global investors than in developed markets.

Are Northbound investors the smart money in China?
We follow Northbound investors' positioning and trading to measure their capabilities at harvesting the unpriced idiosyncratic risk, ie, to determine if they are the smart money in China. We believe the short answer is yes, but not all of them. Among all investors who trade via the Northbound scheme, we differentiate between hedge funds and mutual funds. In line with observations in our previous report, "How to use fundamental insights", we find that hedge funds had been typically good at stock picking and that the stocks they favoured had consistently outperformed over the past three years.

How to use idiosyncratic insights?
By regressing out sector and factor exposures from investor positions, we are able to extract idiosyncratic stock-specific views. Based on the insights, our stock screen by sector implies that smart money generally has greater expertise in sectors with higher idiosyncratic risk. We then devise a stock picking strategy based on a composite signal using investor holdings that return 13.6% with a Sharpe ratio of 3.2. Finally, we create 'smart' factors by incorporating fundamental insights into quantitative factors, and improve all factors' performance, with Value and Growth benefiting the most.

Figure 1: Top screen from our model, in sectors with more stock opportunities

Sector	Ticker	Company	Market cap (US$ bn)	Active weight	WoW chg in active weight
Industrials	300750	CATL	24.0	0.63%	0.08%
Industrials	600004	BAIYUN AIRPORT	4.3	0.03%	0.02%
Industrials	002468	STO EXPRESS	3.6	0.00%	0.02%
Materials	601899	ZIJIN MINING	10.6	0.04%	0.01%
Materials	600803	ENN ECOLOGICAL	1.7	0.06%	0.01%
Materials	600426	HUALU-HENGSHENG	4.0	0.05%	0.02%
Info. Tech.	603501	WILLSEMI	4.1	0.13%	0.06%
Info. Tech.	002410	GLODON	6.5	0.61%	0.12%
Info. Tech.	000938	UNIS	11.2	0.01%	0.13%
Cons. Disc.	002027	FOCUS MEDIA	9.8	0.20%	0.03%
Cons. Disc.	000333	MIDEA GROUP	54.7	1.35%	0.11%
Cons. Disc.	600859	WANGFUJING	1.6	0.03%	0.02%
Cons. Stpls.	002299	SUNNER	3.8	0.10%	0.04%
Cons. Stpls.	600600	TSINGTAO BREWERY	5.7	0.14%	0.07%
Cons. Stpls.	300146	BY-HEALTH	2.2	0.08%	0.01%

Note: Screening is based on a composite score of positioning and trading. Data as of 22 May 2020.
Source: DataYes, HKSCC, MSCI, Wind, UBS Quant Research

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Contents

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Executive summary

In this report we attempt to capture stock-level opportunities in the China A-share market by identifying smart money investors, and then incorporating their forward-looking fundamental insights into quant investing.

Who is the smart money?

Among all types of investors in China, we ask: who are likely the most skilled? To answer this question, we focus on Hong Kong and overseas investors who trade via the Stock Connect Scheme. We track investor holdings and define two types of investors based on their trading behaviour. Overall, we find evidence that among all Northbound investors, hedge funds had been more successful at picking stocks.

With the more insightful investors identified, it begs the question: how do we use their insights? We highlight below a summary of the hypotheses we tested and the main findings:

How to use their insights?

- **Timing effect:** timing the A-share market is arguably hard by simply following the net inflows and outflows invested via Northbound Stock Connect. In contrast, a signal based on the sector and style preferences of Northbound investors can be used to time the market. The sectors and styles favoured by these investors have in general outperformed the market, although excess returns had been volatile.
- **Stock screen:** by regressing out sector and factor exposures in investor positions, we extract their stock-specific views. Our backtest shows that a stock screen based on the views has generated excess returns as large as 30% annualised and in some cases with a Sharpe ratio in excess of 2.
- **Stock screen in each sector:** we observe different levels of stock-specific opportunities in each sector. We demonstrate that fundamental insights have generated higher alphas in sectors with higher idiosyncratic risk.
- **Overlay with quant factors:** we essentially overlay the stock-level forward-looking fundamental insights onto generic quant/style factors. Overall, we are able to create a set of smarter factors and generate significant enhancements across all common factors.

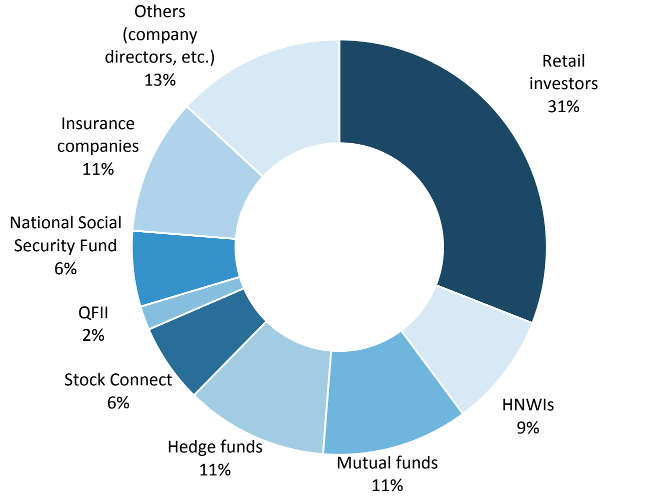
Investor landscape in China

Retail participation is high…

High retail participation is a unique characteristic of China's domestic stock market. As of March 2020, of all A-share free-float market capitalisation, more than one-third was held by a combination of retail and high-net-worth investors (Figure 2).

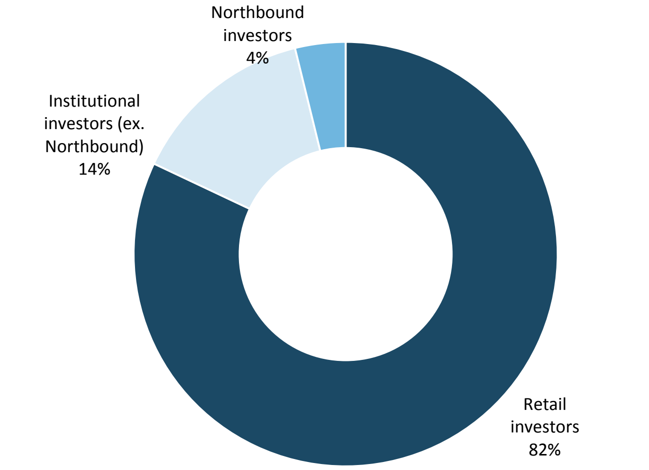
Data from 2019 reported in Figure 3 shows that retail investors contributed to more than 80% of the daily value traded in China's A-share market. By comparison, retail investors only accounted for 20% of the value traded on the Hong Kong stock exchange[1].

Figure 2: Free-float market cap by investor type



Note: Investor holding data updated as of Q120.
Source: Wind, CSRC, CIRC, NSSF, UBS Securities estimates

Figure 3: Value traded by investor type



Note: Above chart shows the estimated breakdown of trading activities in 2019.
Source: Wind, SSE Annual Yearbook, UBS Securities estimates

…but presence of institutions is growing

The asset management industry is young…

The history of institutional investors is comparatively short. While China's stock market started in 1991, the domestic mutual fund industry did not start until 1998. As of 2001, only 45 of them were operating and it was not until 2004 that the first hedge fund was launched in the onshore market.

Among all institutional investors in China, mutual funds are one of the most prominent type and yet, as of March 2020 they only held around 11% of the total free-float market capitalisation. By comparison, in the US, mutual funds have been holding about 35% of the total market capitalisation since 2000 (report).

…but growing fast

Although the asset management industry in China is still in its infancy, it has already gone through periods of dramatic changes and rapid developments.

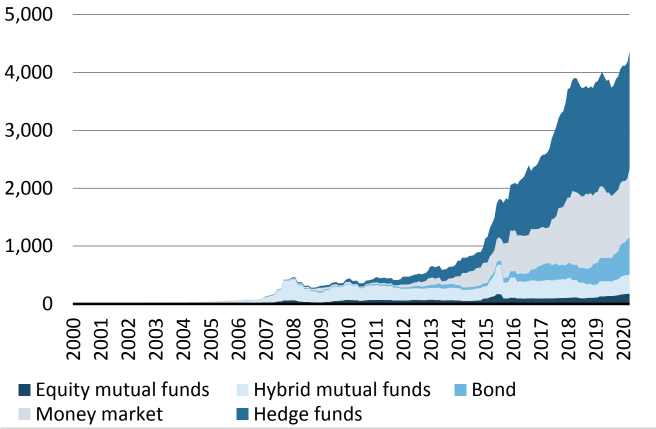
As shown in Figure 4, the total net assets under management of mutual funds and hedge funds rose from US$100bn in 2006 to more than US$450bn by the end of 2007. Following a contraction in 2008-09, the industry expanded at a lower rate until 2014.

[1] Based on the 2018 "Cash Market Transaction Survey" published by Hong Kong Exchanges and Clearing Ltd. (HKEX): https://www.hkex.com.hk/News/Research-Reports/HKEX-Surveys

Since 2014, the Chinese asset management industry has started rapid and relatively persistent growth in both mutual fund and hedge fund products. Asset expansion has occurred in most products, such as in the money market, in bond products, and also in equity products. By the end of March 2020, the total assets under management had quadrupled to US$4.3trn from about US$1trn back in 2014, with US$2.3trn in mutual funds and US$2trn in hedge funds.

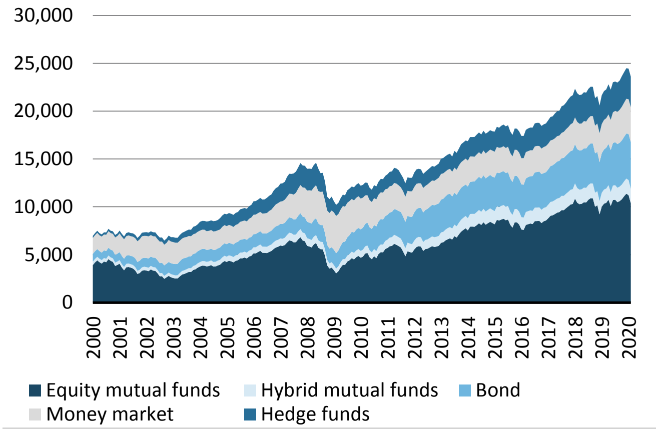
In terms of equity holdings, China's domestic hedge funds and mutual funds, respectively, held 11% of total market capitalisation as at Q120 (Figure 2). As global investors have gained improved access to the onshore market, their percentage of ownership has increased to 8% of total, 6% via Stock Connect and 2% via QFII. This is now of the same order of domestic institutions.

Figure 4: Net assets of mutual funds and hedge funds in domestic China (US$ bn)



Source: Asset Management Association of China, Wind, UBS Quant estimates

Figure 5: Net assets of mutual funds and hedge funds globally (US$ bn)



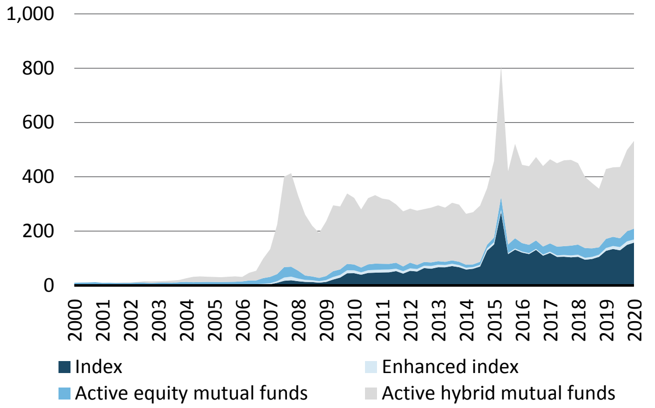
Source: Investment Company Institute, Barclayhedge, UBS Quant Research

Active asset managers in China made up two-thirds of the industry as of Q120 (Figure 6). This proportion is comparable to the level in global asset management back in 2014 (Figure 7). The global market has since witnessed a booming decade in passive fund management that has translated to increased demand for ETF products. Latest data shows that ETFs now represent around one-third of global net assets under management, while index funds make the other third.

It is also worth noting that quantitative funds are an even younger breed of asset managers in China. Compared with other types of onshore mutual funds, they started late and they are still smaller in size.

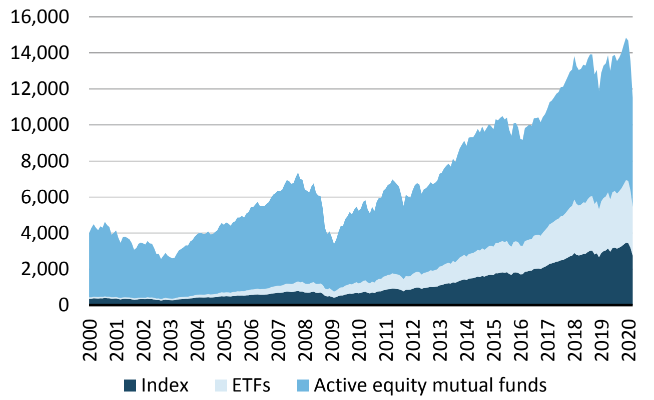
By the end of the first quarter of 2020, the total AUM of quantitative funds in China had grown to US$20bn and active quant AUM only represented US$8bn (Figure 8). Although there has been rapid growth in assets during the 2014-17 period, the growth has slowed in the past three years.

Figure 6: Net assets of China's active versus passive funds (US$ bn)



Source: Wind, UBS Quant estimates

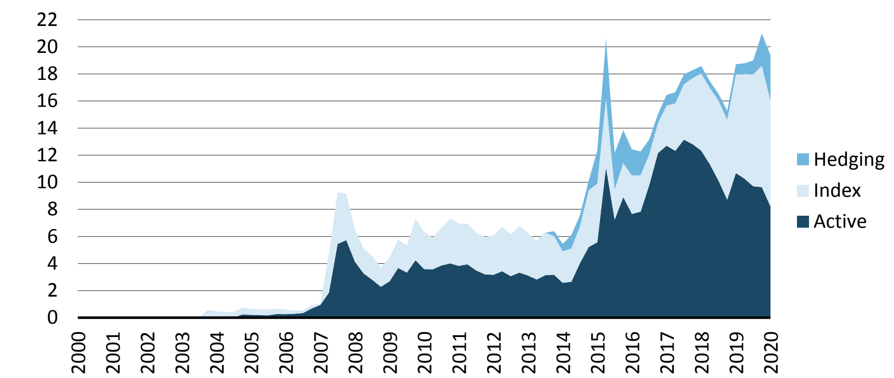
Figure 7: Net assets of global active versus passive funds (US$ bn)



Source: Investment Company Institute, UBS Quant Research

It has been long hypothesised that due to high retail participation, the China onshore equity market has been less efficient, subject to more cognitive bias, and that therefore more alpha opportunities are available for sophisticated investors. As the China market is relatively underexplored by local quantitative managers, it is not surprising to see more alpha opportunities ready for global quantitative investors to harvest than in developed markets.

Figure 8: Net assets of quant mutual funds in China (US$ bn)



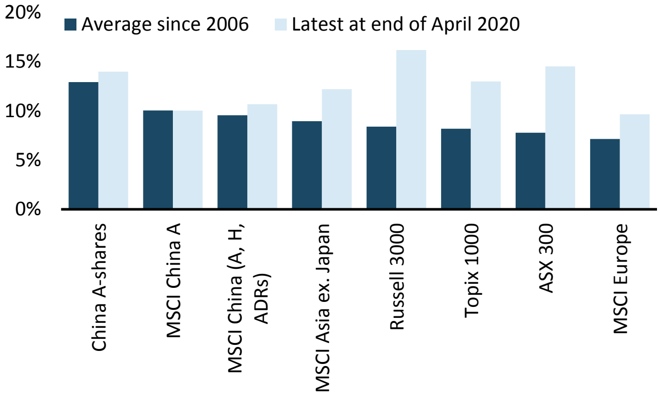
Source: Wind, UBS Quant estimates

More stock-specific opportunities

As retail participation is high in what remains a relatively young stock market, China stands unique and potentially has ample amount of unexplored alpha opportunities to the sophisticated investors.

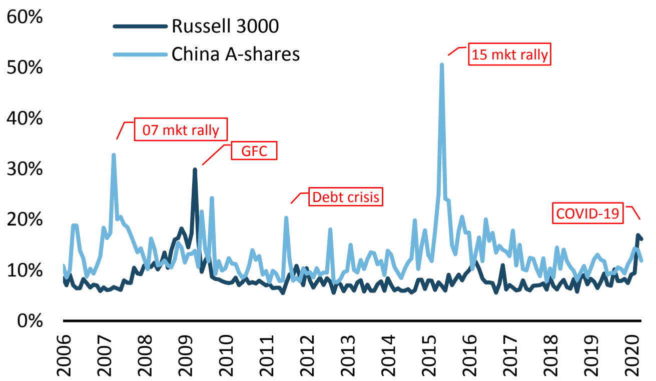
To gauge the extent to which broad market indicators, as opposed to stock specifics, are moving the markets, we look at daily cross-sectional volatility as a measure of market breadth and dispersion (Figure 9 and Figure 10)—when cross-sectional volatility is high, a broad spectrum of returns is available and stock pickers may do well.

Figure 9: Higher return dispersion in China



Note: Data as of April 2020. Source: MSCI, FactSet, UBS Quant Research

Figure 10: Return dispersion in history

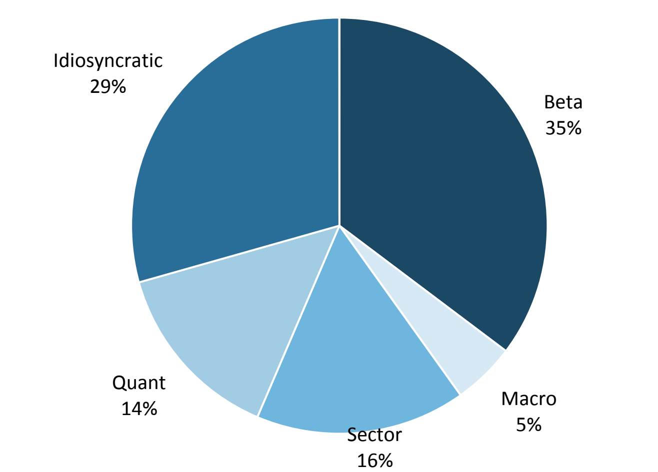


Source: MSCI, FactSet, UBS Quant Research

In Figure 9 we can see that on average, dispersion has been significantly higher in China (13%) than in developed markets, such as the Russell 3000 (8%) and the Topix 1000 (8%). It is interesting to point out that the opportunity set declines when compared with MSCI China A and to the broader China A-share market, as global investors increasingly gain access to these markets.

Figure 10 compares the time series history of dispersion in the Russell 3000 and in the China A-share market. Since 2006 dispersion has almost consistently been greater in China, except at the peak stress in March 2009, during the GFC, and in March 2020, due to the impact of COVID-19. The China stock market appears to be a favourable universe for stock pickers to outperform, provided that they can tell winners from losers.

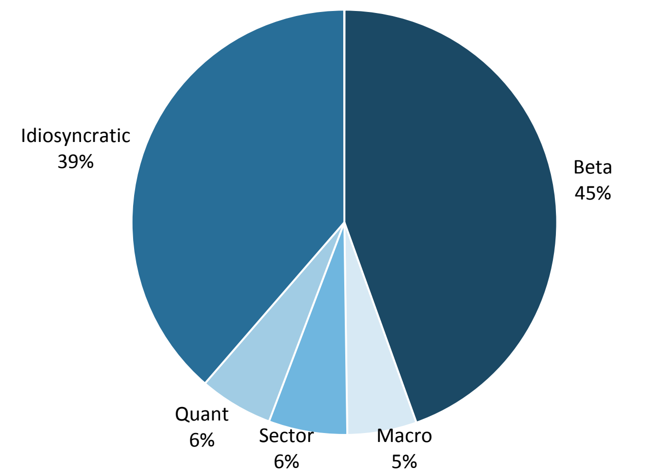
Figure 11: Return decomposition of Russell 3000



Note: Proportion of matched PCA factor returns described by each factor group from April 2015 to April 2020.

Source: FactSet, FTSE Russell, UBS Quant Research

Figure 12: Return decomposition of China A shares



Note: Proportion of matched PCA factor returns described by each factor group from April 2015 to April 2020.

Source: FactSet, Wind, UBS Quant Research

To identify stock-level opportunities available in the market, we run a Principal Component Analysis (PCA) decomposition on stock returns of the Russell 3000 (Figure 11) and the China A-share market (Figure 12). We attribute the eigenvector of each market to the following factors, in that order: beta (market), macro factors, sectors, quantitative factors (styles), and idiosyncratic exposure.

It follows that in the US, 35% of variance in the market was driven by beta, another 35% by a combination of macro factors, sectors, and quant/styles factors, and 29% by stock-specific information. In contrast, in the China A-share market, beta exposure was higher at 45%. The proportion of variance explained by macro factors was similar at 5%, but sector and quant factors represented a much lower contribution, at respectively 6% and 6%, compared with 14% and 16% in the US market. The unexplained proportion of variance attributed to idiosyncratic risk was also much larger in China than in the US, and accounted for 39% of the total variance of the market. In conclusion, in China, the market is a greater driver of stock returns and there are potentially also more stock-picking opportunities as stock-specific information explains a larger amount of variance.

A closer look at the northbound scheme

Market is opening up

Since its launch in 2002, the Qualified Foreign Institutional Investor (QFII) scheme has enabled overseas institutions to access the domestic financial market in China, and over the years, participation of global investors in the China market has been rising. Since the launch of the Stock Connect Scheme in 2014, the interest and significance of overseas investors have surged.

Furthermore, regulatory reforms are supportive of market opening. For example, the investment quota mechanism for QFII/RQFII was recently abolished, and the QFII/RQFII application process largely simplified. Figure 13 highlights recent regulatory changes.

Figure 13: Domestic market is opening up—regulatory timeline

Date	Institution	Regulation
2016-02-04	SAFE	Simplify QFII quota application process
2016-08-16	CSRC	Removal of Stock Connect total investment quota
2018-05-01	CSRC	Daily quota for Stock Connect quadruples from Rmb13bn to Rmb52bn
2018-06-12	SAFE	QFII/RQFII rule relaxation: remove repatriation cap and lock-up period
2019-01-14	SAFE	Increase QFII total investment quota to US$300bn from US$150bn
2019-01-31	CSRC	Consultation paper of QFII/RQFII further relaxation: wider investment scope
2019-09-10	SAFE	QFII/RQFII further relaxation: abolition of total investment quota
2020-05-07	SAFE	Remove QFII/RQFII investment quota mechanism

Source: CSRC, SAFE, UBS Quant Research

Major index providers have also followed the trend and started integrating more China A shares into their index products. In 2019, MSCI completed the increase in its inclusion factor to 20% and FTSE will increase its China inclusion factor to 25% by June 2020 (Figure 14), making the market more accessible to global investors.

Figure 14: Domestic market is opening up—index inclusion of China A shares

Date	Index	Details
2017-06-20	MSCI	Announcement of including China A shares in the MSCI Emerging Markets Index and the MSCI ACWI Index in 2018
2018-05-31	MSCI	1st MSCI inclusion: add 226 China A shares to the MSCI China Index at 2.5% inclusion factor
2018-08-31	MSCI	2nd MSCI inclusion: raise inclusion factor from 2.5% to 5%
2018-09-25	MSCI	Consultation on a further weight increase of China A shares
2018-09-27	FTSE	Announcement of FTSE China inclusion in 2019
2018-12-05	S&PDJI	Announcement of including China A shares to S&PDJI's Global Benchmark Indices (BMI) in 2019
2019-02-28	MSCI	Announcement of further inclusion in three steps in 2019
2019-05-28	MSCI	Step1 MSCI inclusion: inclusion factor of all China A Large Cap shares from 5% to 10%; add ChiNext Large Cap shares at 10% inclusion factor
2019-06-24	FTSE	1st FTSE inclusion: add US$1bn investable market cap and inclusion factor 5%
2019-08-28	MSCI	Step2 MSCI inclusion: inclusion factor from 10% to 15%
2019-09-23	S&PDJI	S&P Emerging BMI (in S&P Global BMI) inclusion: add 1,099 China A shares
2019-09-23	FTSE	2nd FTSE inclusion: add US$3bn investable market cap and raise inclusion factor from 5% to 15%
2019-11-26	MSCI	Step3 MSCI inclusion: raise inclusion factor from 15% to 20%
2020-03-23	FTSE	3rd FTSE china inclusion: add US$0.5bn investable market cap and raise inclusion factor from 15% to 17.5%
2020-06-22	FTSE	4th FTSE china inclusion: add US$1.5bn investable market cap and raise inclusion factor from 17.5% to 25%

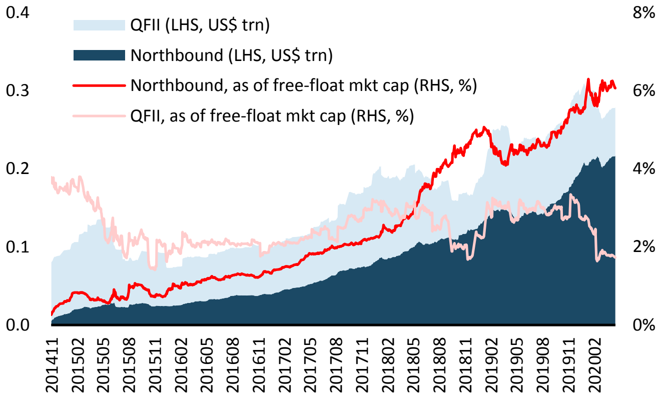
Source: FTSE, MSCI, S&PDJI, UBS Quant Research

Stock Connect versus QFII

With China's equity market continuing to open up, the Stock Connect Northbound Scheme has become the main channel for Hong Kong and overseas investors to access the onshore equity market. Since its inception in 2014, the significance of Stock Connect has been steadily growing.

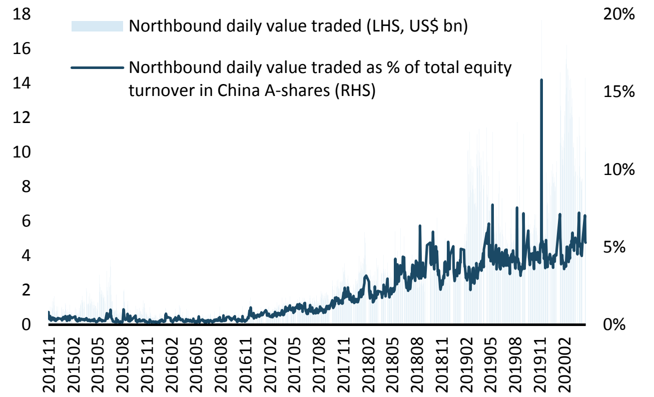
In 2018, the market share of Stock Connect exceeded that of QFII. As of April 2020, the total market value held via Stock Connect investors represented about 6% of free-float market capitalisation in China, while market value of QFII holdings dropped below 2% (Figure 15).

Figure 15: Market value held by QFII and Northbound, as percentage of free-float A-share market cap



Note: Data as of April 2020. Source: Wind, UBS Quant Research

Figure 16: Trading via Northbound as percentage of total equity trading in China A shares



Note: Data as of April 2020. Source: Wind, UBS Quant Research

Stock Connect investors are actually more active in trading compared with other institutional investors in the onshore China market. They contribute to around 5% of total trading in 2020 YTD, up from 4% on average in the past few years. This is more than 22% of the value traded by all institutional investors in China (Figure 3).

In Figure 16, we highlight increased participation of Stock Connect traders. As value traded volatility is high, this chart also sheds light on the more aggressive trading pattern of Northbound Stock Connect investors. Finally, we can see high participation around index rebalancing events.

In this report, we focus on positions and flows of Northbound Stock Connect investors. For backtest results of QFII investors, please refer to [Appendix: Insights from QFII top holdings](#).

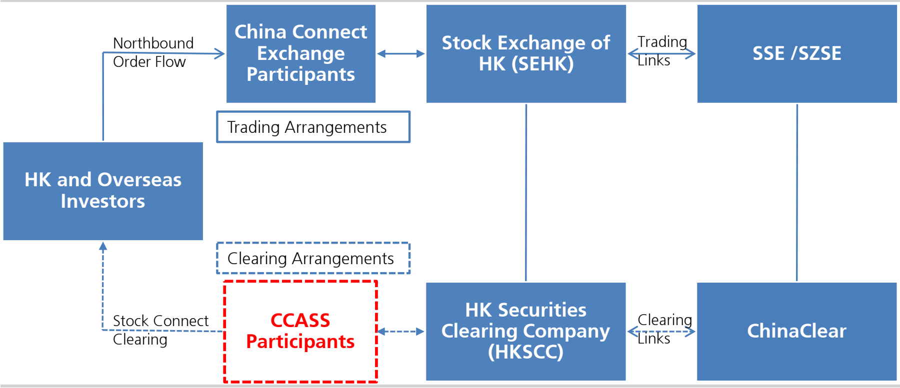
Data description

The Stock Connect Northbound Scheme allows Hong Kong and overseas investors to trade a set of eligible securities listed on the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE).

To clear their positions, investors use the services of Central Clearing and Settlement System (CCASS) participants (Figure 17). On the one hand, Hong Kong Securities Clearing Company (HKSCC) settles with China Securities Depository and Clearing Corporation Limited (ChinaClear). On the other hand, HKSCC settles with its CCASS clearing participants, who are either brokers or custodian banks registered in CCASS.

Among all clearing participants, investors can choose either their brokers or custodians for the clearing services they need, based on costs, trading frequency, and requirements for flexibility.

Figure 17: Trading and clearing arrangements for Northbound



Source: HKEX, HKSCC, UBS Quant Research

In this report, our main dataset is the shareholding information released by HKSCC. Since December 2016, the HKSCC has been publishing daily data documenting the stock-level holdings of each CCASS participant in the Stock Connect Northbound Scheme. The top four clearing participants are custodian banks and they hold an aggregated 74% market share. The six clearing participants that follow are all brokers and account for 18% of the market (Appendix: Top CCASS participants).

Figure 18: Data availability for different types of investors in China

	Onshore investors			HK and overseas investors		
	Northbound	QFII	Global ownership	Mutual funds	Hedge funds	Retail investors
Data source	HKEX/HKSCC shareholding in aggregate and by participant	Financial report of listed companies	FactSet Ownership Dataset, 13F, stakes of fund-stock level ownership	Fund report	Financial report of listed companies	Trading data sorted by trade size from SSE, SZSE
Coverage	100% of Northbound investors	Only cover the top 10 shareholders	Part of both onshore and offshore, mutual funds and hedge funds	100% of mutual funds	Cover only the top 10 shareholders	100% daily transactions
Frequency	Daily	Quarterly	Monthly, quarterly or longer	Quarterly	Quarterly	Daily
Data lag	One day	One month or longer	About 3 months	15 trading days	One month or longer	One day
History	Since 2017	Since 2004	Since early 2000s	Since 2003	Since 2004	Since 2014
Measures	Stock-fund level	Stock-fund level	Stock-fund level	Stock-fund level	Stock-fund level	Stock level only

Source: UBS Quant Research

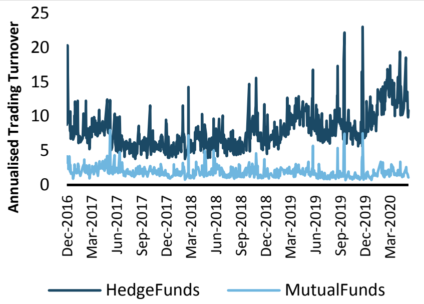
A tale of two investors: hedge funds and mutual funds

By analysing the holdings of CCASS participants, and comparing investors that clear through brokers to investors that clear through custodians, we observe two types of trading behaviour and label them as follows:

- **Mutual funds:** investors that clear and settle with custodians. They tend to be long-only mutual funds. They make up a large proportion of market value (Figure 20), but mostly trade at a low frequency (Figure 21).

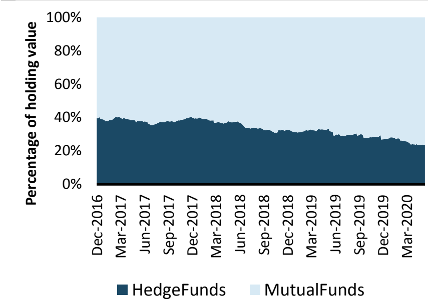
- **Hedge funds:** investors who prefer to settle their security holdings through their brokers. They tend to trade at a higher frequency. They represent a lower fraction of value traded.

Figure 19: Annualised turnover by two types of Northbound investors



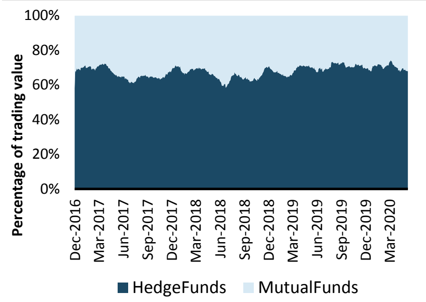
Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 20: % of market value held by hedge funds vs. mutual funds



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 21: % of value traded from hedge funds vs. mutual funds

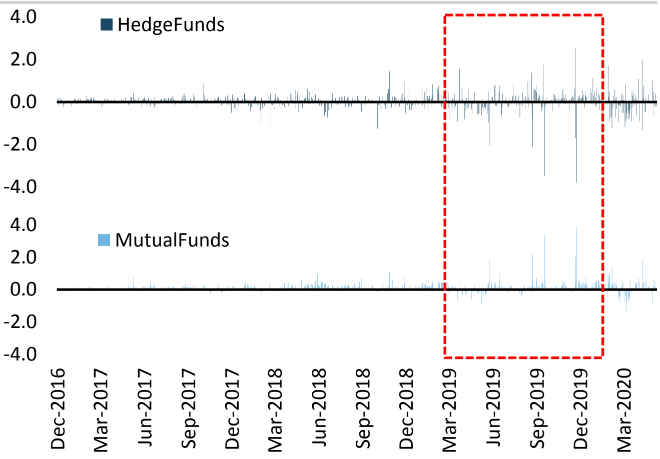


Source: DataYes, HKSCC, Wind, UBS Quant Research

As shown in Figure 19 and Figure 22, it is interesting to note that around index rebalancing dates, the difference in trading behaviour is especially significant. In May, August, September and November 2019, for instance, on MSCI rebalancing dates, funds flows increased as much as four times those of the previous days.

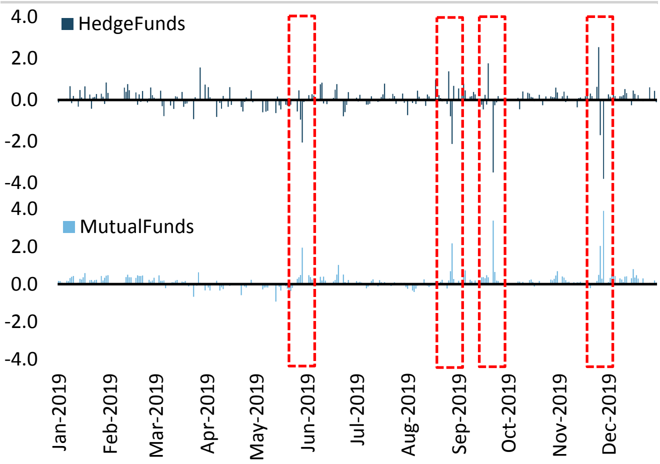
It is also interesting that the group we label "mutual funds" generally entered the market on a rebalancing date and bought stocks. On the other hand, the group we label "hedge funds" mostly traded in before a rebalancing date, and traded out into a rebalancing date, as highlighted by the large positive and negative inflows in Figure 22 and Figure 23.

Figure 22: Daily net inflow via Northbound (US$ bn)



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 23: Northbound net inflow in 2019 (US$ bn)



Source: DataYes, HKSCC, Wind, UBS Quant Research

Measures: holdings versus flows

In the following sections, we gauge the information content in investor positions of both mutual funds and hedge funds using two different measures:

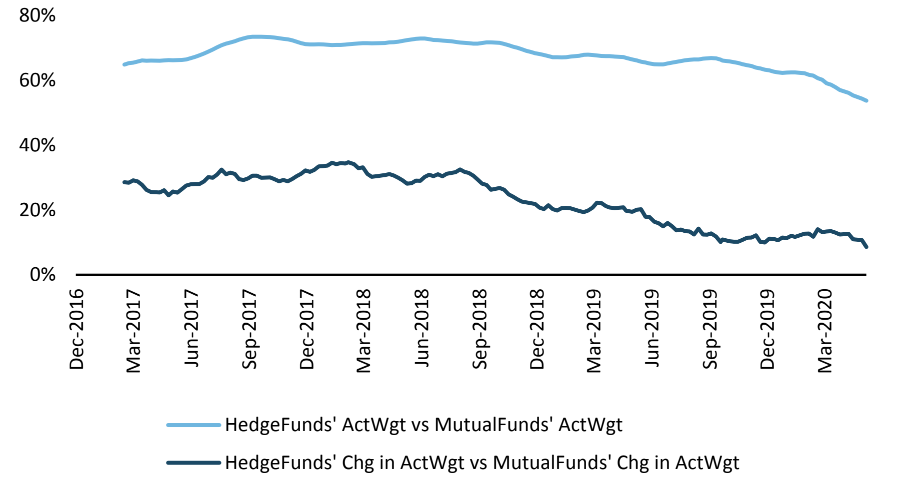
- **Active weights:** calculated as investors' weights minus index weights. Investor weights are calculated as the sum of all investor stock holdings. We then compare aggregate stock-level weights with the relevant benchmark to form the relative over- and under-weights.
- **Change in active weights:** week-over-week changes in active weights.

We design these two measures to capture the information in both holdings (positioning) and fund flows (trading) of hedge fund and mutual fund investors. By measuring active weights we are able to rule out passive investors as we negate benchmark index weights.

By design, the change in active weights captures the interim changes in investor insights. We look at weekly changes to capture more meaningful changes and remove the short-term noise in trading. In addition, it should be noted that changes in active weights can be interpreted as a standardised version of fund inflows and outflows.

To identify the most skilled investors, we respectively measure insights from hedge fund and mutual fund investors. We observe in Figure 24 that there is comparatively high correlation (often greater than 60%) between the positioning of the two types of investors, but the correlation between their short-term trading activities is much lower (recently dropped below 20%).

Figure 24: Correlation between hedge funds and mutual funds



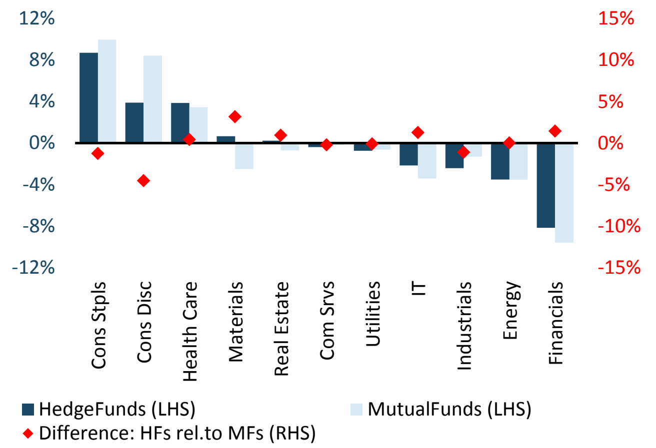
Note: The rank correlations are calculated between the cross-sections of hedge funds and mutual funds' active weights. The correlation coefficients in the above chart are rolling 3-month average.
Source: DataYes, HKSCC, Wind, UBS Quant Research

Sector and style preferences

We can further aggregate stock-level active weights to sector and style levels. Figure 25 and Figure 26, respectively, show the historical averages of active weights grouped by sectors and styles. There is strong consensus between hedge funds and mutual funds in terms of sector positioning. They are both over/under-weight the same sectors with the exception of Materials and Real Estate, where hedge funds have a small overweight and mutual fund a small underweight. In

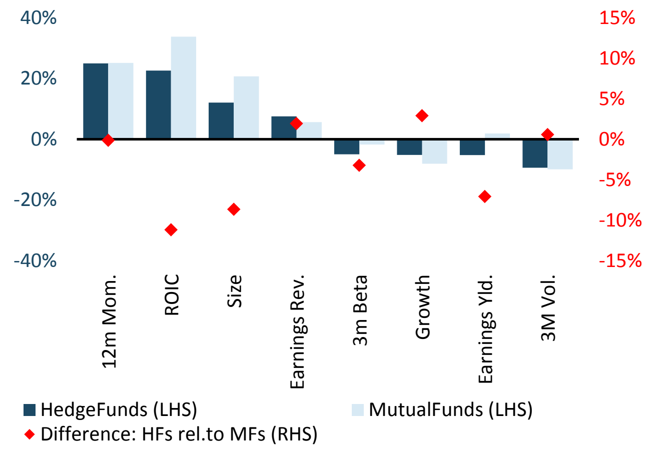
Figure 27 we can see that the positioning has been fairly consistent over the years. Indeed Northbound investors have maintained very consistent sector preferences: consistent overweight in Consumer Staples and Consumer Discretionary, and consistent underweight in Financials and Energy. In more recent years, hedge funds have increased their positioning in Materials and Real Estate, and mutual funds seem to be following.

Figure 25: Aggregate active weights by sector



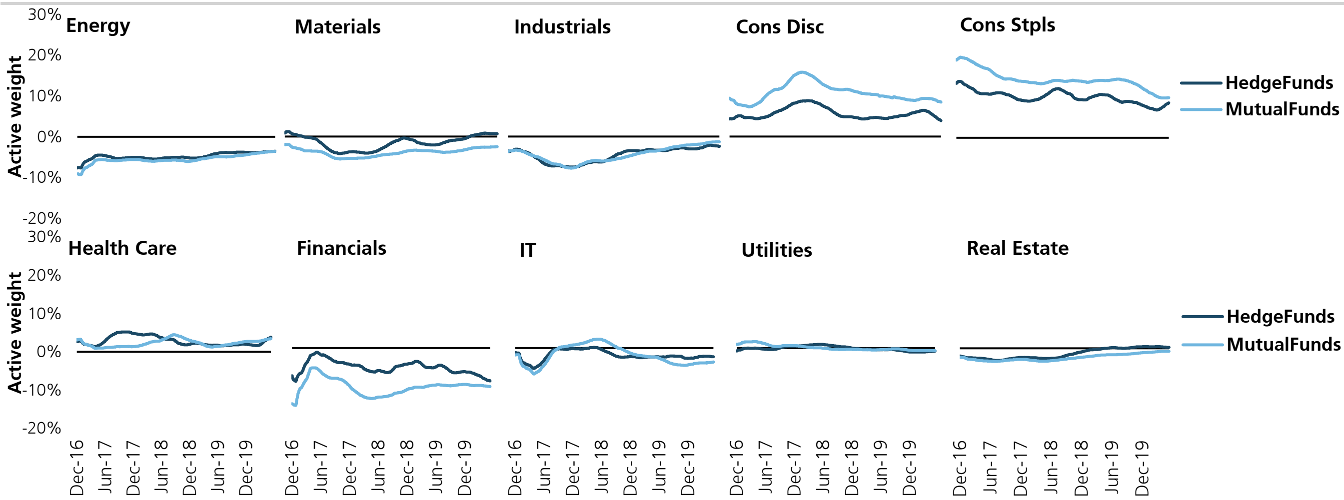
Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 26: Aggregate active weights by style



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 27: Northbound investors' active positions by sector

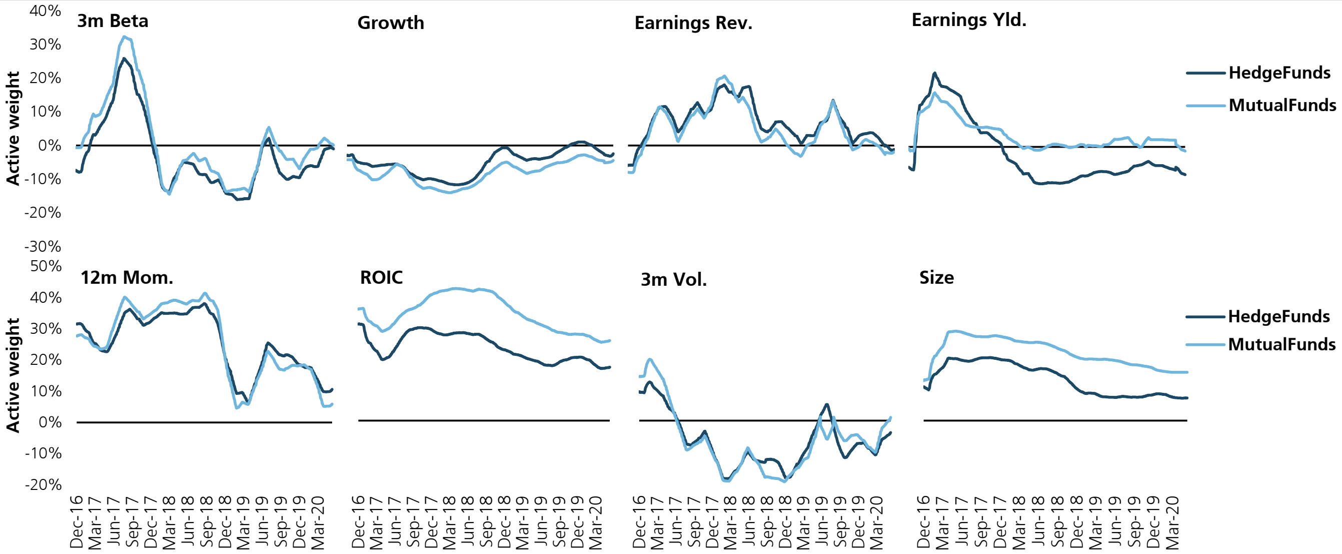


Source: DataYes, HKSCC, Wind, UBS Quant Research

As investors' residual-style exposure is greater, the disagreement in style exposure between hedge funds and mutual funds is also greater (Figure 26). It is especially noticeable in their tilts in High ROIC, Size, and Earnings Yield styles. Both types of investors agree in their exposure to High Momentum and Low Volatility.

Figure 28 shows the style exposure of both types of investors. Both have maintained overweight in ROIC, Momentum and Size very consistently. Yet, their exposure to Beta, Earnings Revisions and Value has greatly fluctuated through time.

Figure 28: Northbound investors' active positions in styles



Source: DataYes, HKSCC, Wind, UBS Quant Research

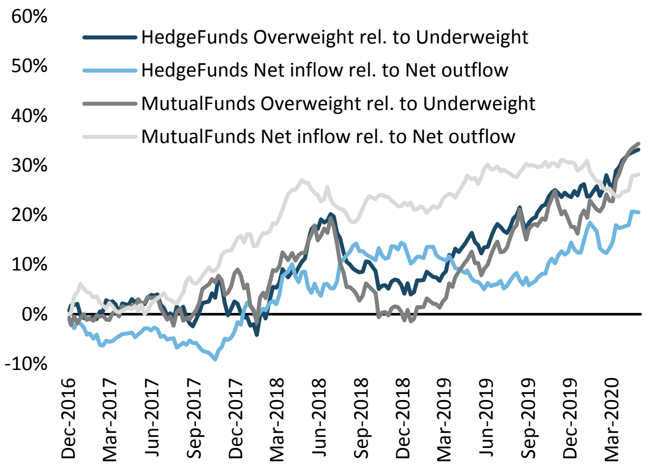
Timing effect

In the following section we investigate data to determine whether hedge fund and mutual fund positions can be used to time sectors and styles.

Sector timing

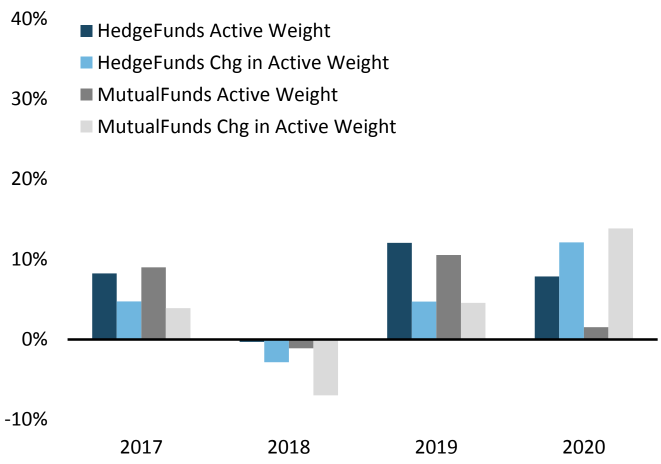
We highlighted in Figure 25 and Figure 27 that the sector preference of Northbound investors has been very persistent over time. In Figure 29 we see that this translates to very mixed performance for sector timing. There was a big drawdown in the second half of 2018, yet since 2019, the cumulative performance of sector preferences based on the over/under-weights of hedge funds and mutual funds recovered and is now up 30% from the lows. In line with the mixed performance, we document in Figure 30 that rank correlation between sector-level preferences and subsequent sector performance has been volatile over the past four years. It indicates that investor preferences have not always accurately forecasted future sector performance.

Figure 29: Sector timing by investor positions of hedge funds and mutual funds



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 30: Rank correlation between investors positions and subsequent-week sector performance



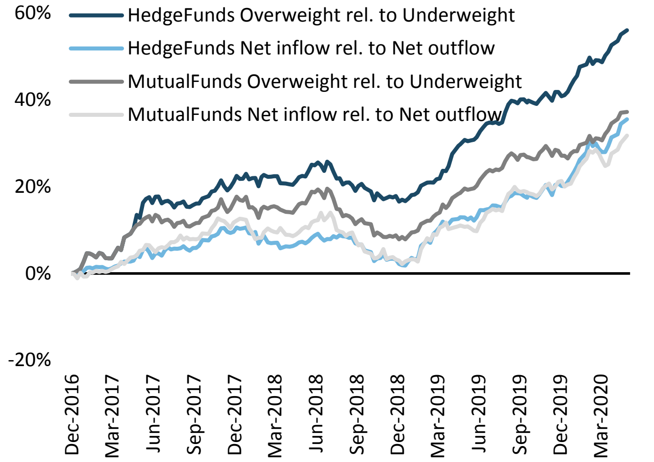
Source: DataYes, HKSCC, Wind, UBS Quant Research

Style timing

Signals based on Northbound investors' style preferences (both in terms of active weights and change in active weights) used to time future style performance deliver better yields and risk-adjusted returns than signals based on sector preferences. Although persistent, investors' exposures to styles are more dynamic than that for sectors. The drawdown experienced in the second half of 2018 can be mainly attributed to the Small-cap and High Growth rally, while Northbound investors remained overweight Large-cap and High Quality.

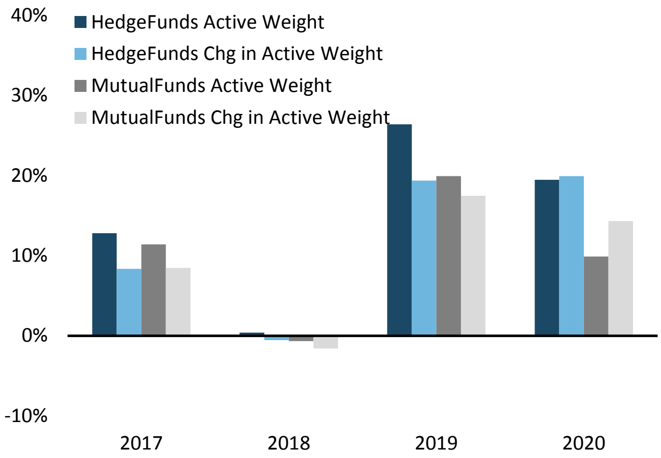
Starting from 2019, the performance of this timing signal quickly recovered and returned as much as 30% annualised (Figure 31). Meanwhile the rank correlation between investor preference and future style performance increased to levels as high as 20% (Figure 32).

Figure 31: Style timing by investor positions of hedge funds and mutual funds



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 32: Rank correlation between investor positions and subsequent-week style performance



Source: DataYes, HKSCC, Wind, UBS Quant Research

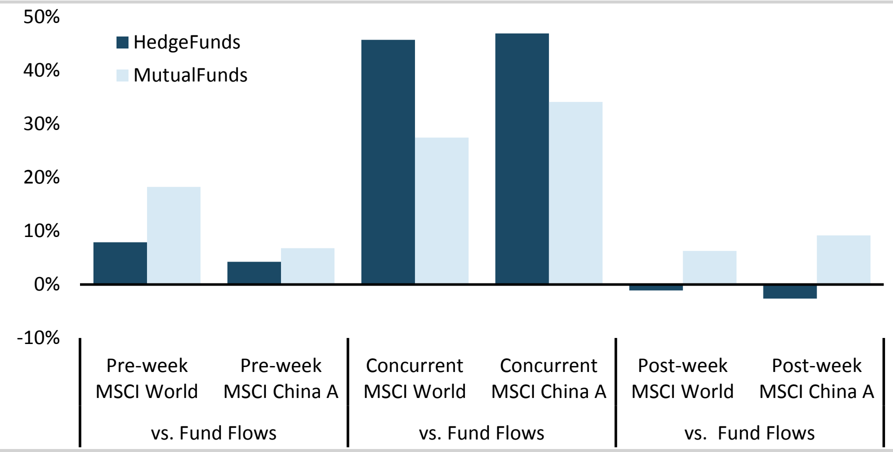
Market timing and fund flow drivers

In addition to sector and style preferences, we investigate whether Northbound investors have market timing skills. To answer this question, we look at the correlation between investors' fund flows and market index performance during the concurrent time period, as well as in the previous and following weeks.

The first step is to measure the correlation between fund flows and pre-week index returns in an effort to investigate whether investors are trend followers or contrarian traders.

The left block in Figure 33 shows that correlation between fund flows and onshore local index performance is not very significant. Both hedge funds and mutual funds display some level of positive correlation with market returns in the previous week. It indicates that when markets go up and sentiment shifts to risk-on, global funds generally flow into emerging markets such as China via the Northbound scheme, whereas global funds exit China in down markets.

Figure 33: Correlation between Northbound fund flows and market index performance during previous week, concurrent week, and following week

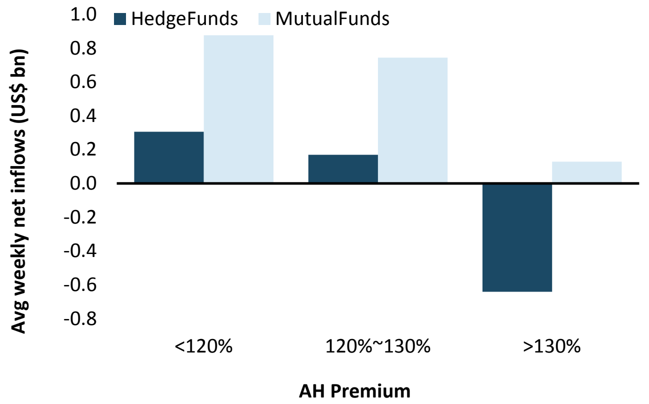


Source: DataYes, HKSCC, Wind, UBS Quant Research

By comparison, the correlation between concurrent market returns and fund flows is more significant than that between the previous and following weeks, which implies a concurrent market impact instead of a leading/lagging signal for market timing. In other words, the net inflows and outflows could push up or strike down the concurrent market index but cannot be used to forecast future performance.

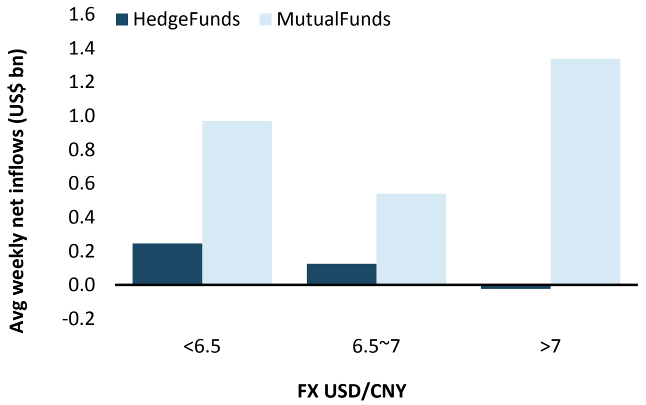
In the subsequent week, hedge fund investors' flows correlate negatively with market returns. This highlights the shorter horizon and more dynamic trading pattern of hedge funds. Indeed, mutual funds would continue to trade in/out as they correlate more positively with market returns, showing that we chase the market for longer.

Figure 34: Fund flows vs. A/H price premium



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 35: Fund flows vs. foreign exchange



Source: DataYes, HKSCC, Wind, UBS Quant Research

Other drivers of Northbound fund flows are the A/H price premium and foreign exchange rates, as shown in Figure 34 and Figure 35. Hedge fund investors are active in trading the A/H premium and quick to exit when the premium reaches high historical levels. Mutual fund investors' preference is less dramatically dependent on the level of A/H premium, which would be a characteristic of long-only funds. Exchange rates also impact fund flows as they affect currency funds, although mutual funds seem to be less sensitive.

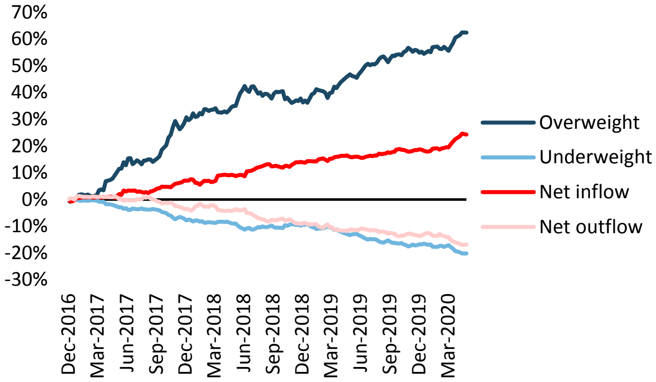
Stock selection

Hedge funds versus mutual funds

In this section we focus on the stock selection skills of hedge fund investors and mutual fund investors that trade via the Northbound scheme.

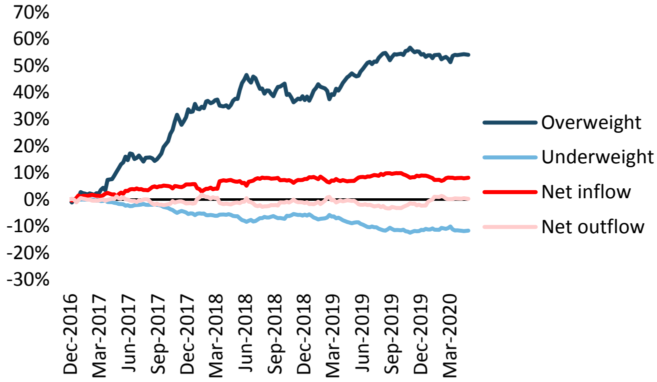
In Figure 36, we can see that stocks favoured by hedge funds, as measured by active overweights, had outperformed the benchmark, generating more than 60% cumulative alpha over the past three years. On the other hand, hedge funds' active underweight names have underperformed by 20%. Additionally, if we follow the short-term trading of hedge funds, although the annualised excess return is lower at 7%, the risk-adjusted performance appeared very attractive. The annualised volatility is lower at 3%, for a Sharpe Ratio of 2.3 for the net-inflow basket (Figure 38). The performance of the outflow basket is similar.

Figure 36: Performance of hedge funds' positions



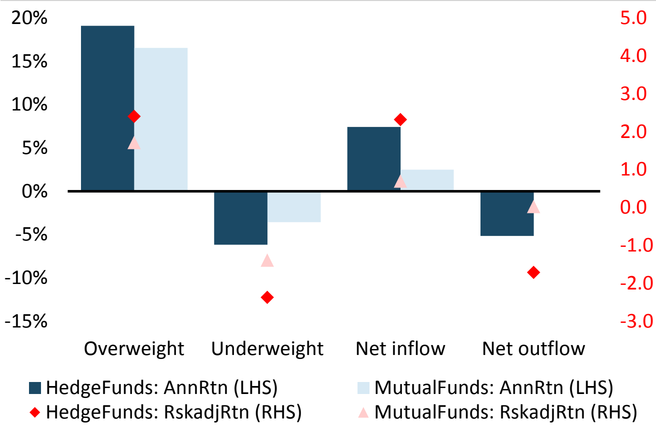
Note: Performance is calculated as the cumulative excess return relative to the benchmark of all Northbound eligible stocks, cap-weighted average of total returns in USD; back-test period is since Dec 2016.
Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 37: Performance of mutual funds' positions



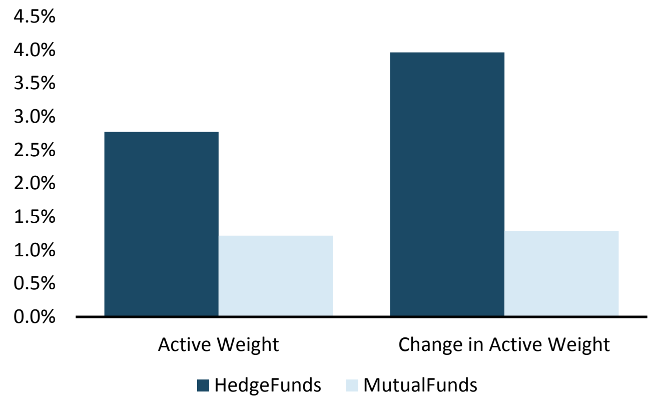
Note: Performance is calculated as the cumulative excess return relative to the benchmark of all Northbound eligible stocks, cap-weighted average of total returns in USD; back-test period is since Dec 2016.
Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 38: Performance comparison



Note: Back-test period is since Dec 2016.
Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 39: Information coefficient



Note: Information coefficient is the rank correlation between measures and subsequent week returns. Source: DataYes, HKSCC, Wind, UBS Quant Research

The overall picture is similar when tracking the signal based on mutual funds. Overweights generated 50% returns but it should be noted that the performance has been muted over the past year, while the signal based on hedge funds' positions still provides positive returns (Figure 37). Underweights' returns are lower for mutual funds as well, and the basket of names underperformed the index by 10%. Unlike for hedge funds, net flow measures are poor trading signals in the case of mutual funds.

By comparing the performance of signals following hedge funds and mutual funds' positions, we observe that hedge funds display a greater information advantage over mutual funds. In particular, hedge funds look quicker and more efficient at capturing the impact of new information. Indeed, the performance of the signal based on investors' changing active weights has a near-zero yield for mutual funds, while it is very significant for hedge funds. As mutual funds trade and churn their inventory less often, it also appears that their trading flow displays less information.

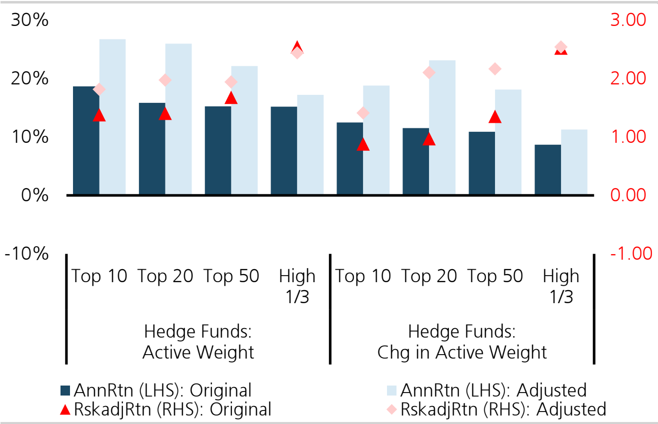
Although based on our measures hedge funds have generated better alphas within their overweights than their underweights, it should be noted that within the short leg, we are mixing up stocks that hedge funds do not like, and so do not own, and stocks that they hold less, as we only have access to their holdings data. In this study, we do not investigate any short interest data. By construction, the short leg of our strategy is not the basket that hedge funds go short. The long leg of our strategy, however, is the basket that hedge funds own and go long and are overweight. Therefore, we will focus on the long leg in the following sections.

Idiosyncratic insights

We recognise that both types of investors are skilled at picking stocks (with hedge fund investors showing more capability of leveraging their insights) and in the following section, we focus on stock idiosyncratic insights. For that purpose, we regress stock returns on the following factors: sector, size, and other generic factors including Value, Quality, Earnings, Growth, Momentum, Volatility and market.

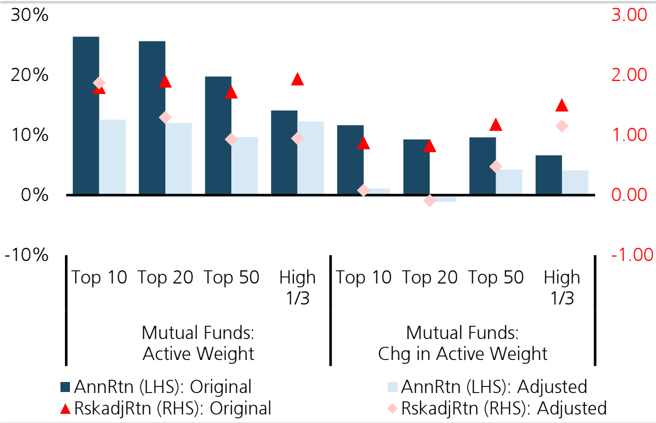
By regressing out common factor exposures from stock returns, we are left with stock-specific returns targeted by investors and therefore a measure of their idiosyncratic skills. It is interesting to see that using hedge funds' stock-specific views and avoiding undesirable style exposure, we are able to consistently improve stock screen's performance (Figure 40). For mutual funds, however, the idiosyncratic insights do not perform as well (Figure 41). It follows that a greater proportion of mutual funds' insights is driven by common factors.

Figure 40: Hedge funds' idiosyncratic insights perform better than unadjusted measures



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 41: Mutual funds' positions perform less well with factor and sector exposures regressed out



Source: DataYes, HKSCC, Wind, UBS Quant Research

Among the top baskets, we can see that annualised returns deteriorate as we include more stocks in the portfolio. On the other hand, the volatility in portfolio performance also decreases and at a higher rate. As a result, we obtain a higher risk-adjusted return in the top 1/3 basket than that in the top-10 basket (Figure 40). This is true for signal based on active weights and change in active weights.

In summary, even if the sector and factor preferences can be similar between mutual funds and hedge funds, the more dynamic nature of changes in active weights of the latter allows us to build a better signal that could harvest more returns from their stock-specific views. Therefore we will focus on the positions and flows of hedge funds in the following sections.

Combining positions and flows

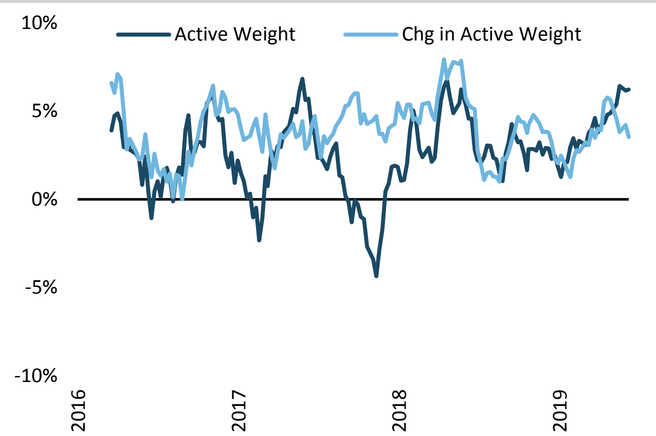
As shown in the previous sections, we built two measures to capture stock-specific views: (a) active weights, to quantify the over- and underweight of active investor positioning relative to the market, and (b) week-over-week changes in active weights, to measure the interim fund inflows and outflows, ie, how much they trade around their positions.

If we take a closer look at the two measures, we can observe that the information coefficient of fund flows is less volatile than that of positions. Indeed over a long period of time the market would have experienced several style and factor rotations. This is best captured by changes in active weights, which is a more dynamic measure, while active weights would better capture the long-term themes in the market but be hurt by temporary style rotations.

Figure 43 also shows a negative correlation between investor positioning and interim trading. It implies that the two measures could be combined to produce a better risk-adjusted signal, reducing the volatility over history.

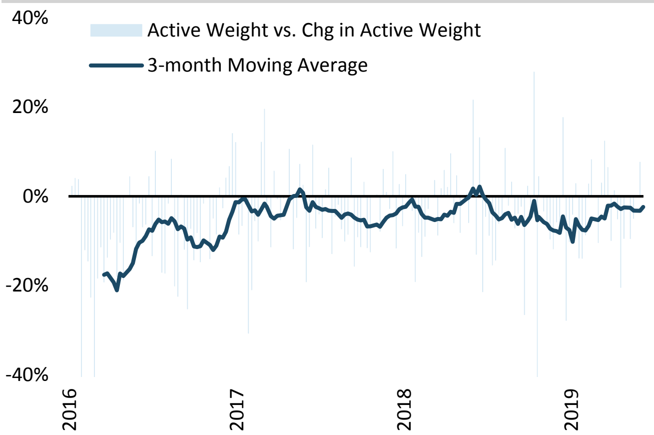
Based on the above findings, we build a composite score that is an equal-weight average of active weights and change in active weights, combining the signals of investors' long-term insights and short-term trading.

Figure 42: Information coefficients (IC) of active weight and change in active weight



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 43: Rank correlation between active weight and change in active weight

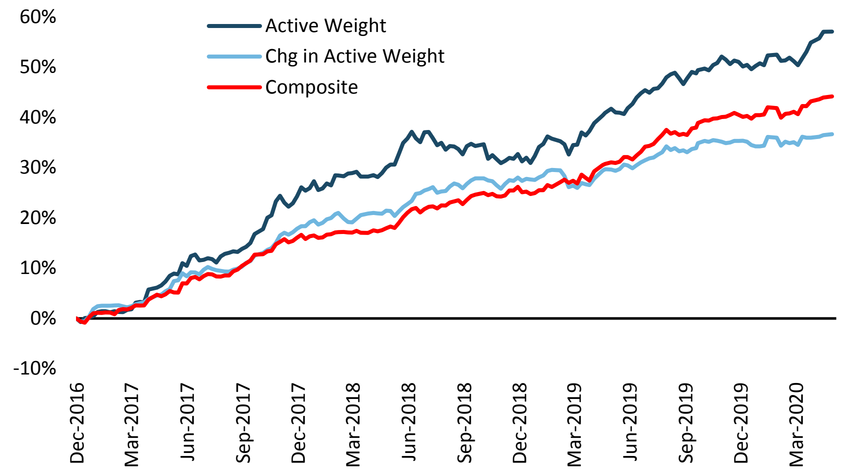


Source: DataYes, HKSCC, Wind, UBS Quant Research

In Figure 44 and Figure 45, we compare the backtest results of trading the signals based on active weights and change in active weights, together with the composite signal. Our backtest shows that the composite model has greater risk-adjusted performance. Volatility benefits most from the diversification effect and is lower than the volatility of original signals. Returns are not diluted away and are close to the arithmetic average of the two signals

Over the backtest period, the composite signal has the greatest Sharpe ratio at 3.24, compared with 2.44 and 2.54, respectively, for the signals based on active weights and change in active weights. The maximum drawdown is also significantly lower at -2.1%, which is a threefold reduction compared with the signal based on active weights. The strategy based on the composite signal also has a relatively low turnover; similar to that of the strategy based on active weight.

Figure 44: Performance of the composite measure



Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 45: Performance statistics

	Active Weight	Chg in Active Weight	Comp Score
Annualised Excess Return	17.2%	11.3%	13.6%
Annualised Volatility	7.1%	4.4%	4.2%
Risk-adjusted Excess Return	2.44	2.54	3.24
Maximum Drawdown	-6.2%	-3.6%	-2.1%
One-side Turnover	51%	62%	54%

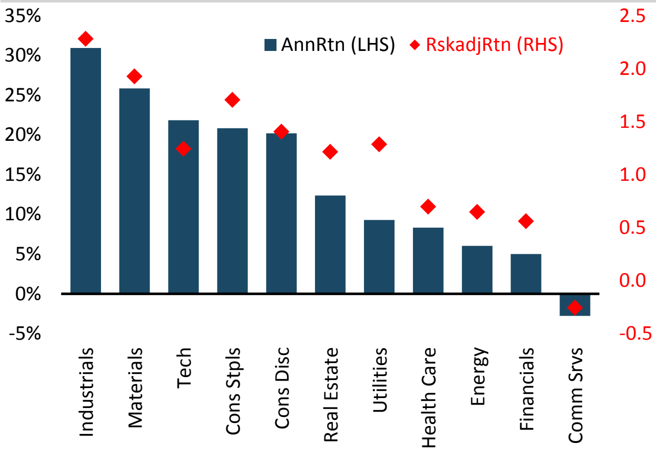
Source: DataYes, HKSCC, Wind, UBS Quant Research

Where does the expertise lie?

As we previously documented, hedge funds are better at capturing stock-specific opportunities available in the market.

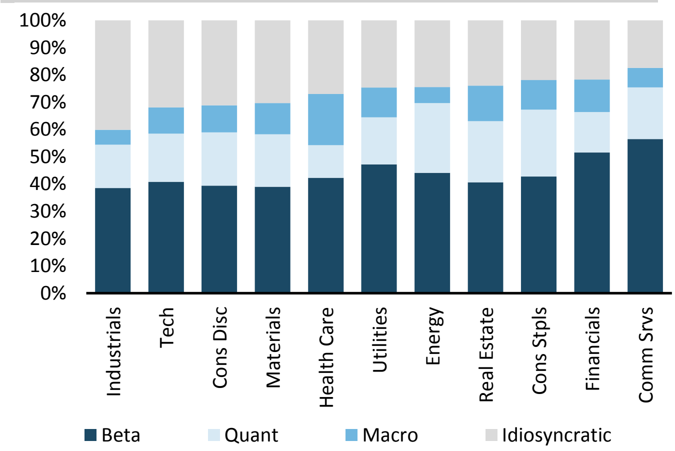
In the following section, we investigate the performance of hedge fund investors by sector. Based on the composite score of hedge fund insights, we built a stock screen model in each sector. Figure 46 documents that the model performance has been greater, or in other words, the hedge funds' expertise has been higher, in the Industrials, Materials, Information Technology, and Consumers sectors.

Figure 46: Excess returns generated by hedge funds' insights in each sector



Note: Relative to sector level benchmark returns by top 10 names ranked by hedge funds' composite score.
Source: DataYes, HKSCC, Wind, UBS Quant Research

Figure 47: Return decomposition by sector

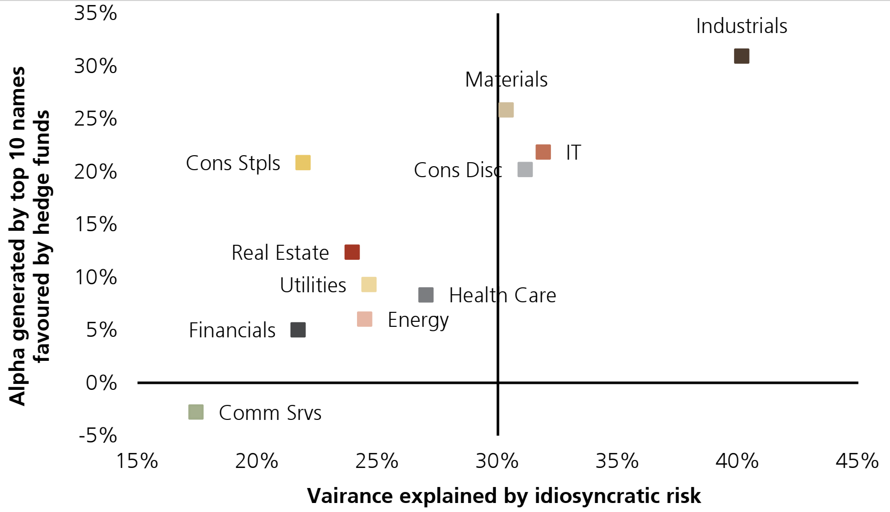


Source: DataYes, HKSCC, Wind, UBS Quant Research

Market and macro factors are arguably hard to predict and apply to a large subset of stocks. So the less they drive a sector, the more room for skilled stock pickers to outperform. In order to quantify the amount of idiosyncratic risk to each sector, we perform a principal component analysis on stock returns in each sector and map the components to market beta, quant/style factors, and macro factors (Figure 47). Moreover, the availability of stock-specific opportunities can vary across sectors. We can see that sectors where hedge funds performance is greater are also sectors with the highest levels of idiosyncratic risk.

In Figure 48 we plot the alpha generated by hedge fund investors as a function of variance attributed to idiosyncratic risk to highlight the clusters of sectors that perform best. On that chart, both Industrials and Communication Services stand out as providing significantly greater/lower returns.

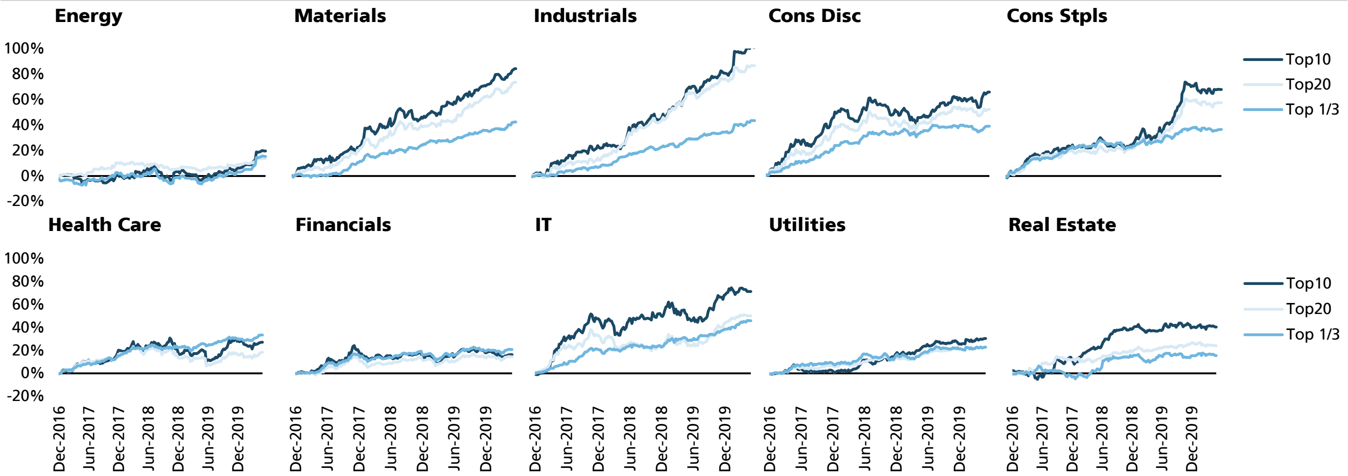
Figure 48: Comparison between stock-level opportunity and alpha generated by hedge funds in each sector



Source: DataYes, HKSCC, Wind, UBS Quant Research

In Figure 49 we report returns of the composite signal applied to each sector. As highlighted, Materials and Industrials have outperformed and are continuing to trend up. The Consumers and IT sectors look more regime-sensitive. After a period of moderate returns, the IT sector is generating positive returns again while Consumers is not performing. Energy, which was the worst performing sector, has picked up in recent weeks, due to the impact of COVID-19 on global oil demand.

Figure 49: Excess returns generated by hedge funds' top positions in each sector



Source: DataYes, HKSCC, Wind, UBS Quant Research

We devise a strategy that trades the top 10 names in each sector based on the composite score. To further investigate whether our ex-post portfolio allocation is driven by stock-specific information, or whether it is exposed to other risk factors, we use our in-house risk analysis tool, Portfolio Analysis System (PAS)[2] to run a risk attribution. The analysis provides insights on realised drivers of returns of our strategy and shows to what extend our portfolio is exposed to market risk (Beta), macro factors, quant/styles, as well as stock-specific risks (Idiosyncratic).

[2] Refer to our report for an introduction to PAS. The system is available by request.

Figure 50 reports on the PAS analysis results. We document higher idiosyncratic risk in the Industrials, Materials, Information Technology, Consumer Discretionary, and Consumer Staples portfolios. This is consistent with previous findings that sectors where hedge funds have greater expertise are sectors with more idiosyncratic risk available. As targeted ex-ante, our stock screen model has been taking on more stock-specific risks and the ex-post drivers are also more geared toward stock-specific information. The sector of Communication Service is an exception, as there are only three stocks in this sector in the Northbound eligible universe as of May 2020.

Figure 50: Risk breakdown (% of contribution to total variance) of sector-level portfolios

	Energy	Materials	Industrials	Cons Disc	Cons Stpls	Health Care	Financials	IT	Comm Srvs	Utilities	Real Estate
Beta	9.0	2.0	0.1	5.2	3.7	0.8	2.7	0.1	0.6	43.0	1.0
Macro	15.3	8.7	5.5	7.1	2.9	6.8	5.9	3.0	1.6	5.3	6.2
Quant/Style	33.4	5.9	10.7	14.6	26.1	41.6	49.4	14.7	3.6	14.9	49.3
Value	-2.5	0.1	2.0	1.1	3.8	18.6	11.5	10.6	0.5	0.5	11.7
Quality	15.3	0.5	0.0	9.5	16.0	3.5	11.9	2.8	-0.1	3.8	0.5
Earnings Rev.	5.4	0.0	0.0	-0.1	-0.4	0.0	0.0	-0.1	-0.1	0.1	0.1
Momentum	12.0	2.5	8.5	1.8	5.5	18.9	12.7	1.3	0.4	5.2	18.2
Volatility	-1.3	0.0	0.0	2.2	0.4	-0.5	3.7	0.4	2.3	5.2	20.1
Size	4.5	2.7	0.3	0.0	0.7	1.0	9.7	-0.3	0.7	0.1	-1.3
Idiosyncratic	42.4	83.5	83.7	73.1	67.3	50.8	41.9	82.2	94.2	36.8	43.5

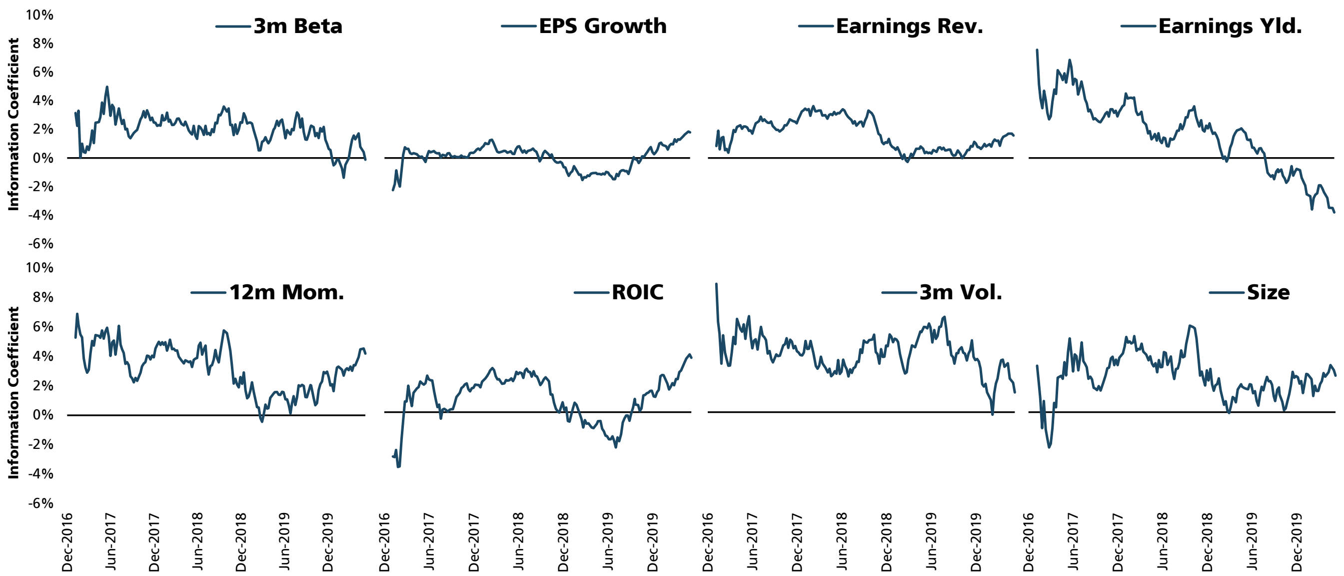
Source: DataYes, HKSCC, Wind, UBS Quant Research

From factors to smarter factors

In the last section of this report we focus on how to use smart investors' insights to create smarter factors. On the one hand, the generic quant factors should still generate high excess returns in the China A-share market compared to developed markets, as opportunities are less exploited due to high retail participation, a less efficient market, and a lower number of quantitative asset managers.

On the other hand (see Figure 51), we have started to document more volatility and faster rotation in factor performance in recent years, and falling information coefficients. Therefore it appears to be a good time to revisit factor definitions and seek increased performance. Here, we attempt to capture forward-looking fundamental insights from active managers and incorporate them into generic factor definitions.

Figure 51: Information coefficients of generic factors are either falling or less stable in recent years



Note: Information Coefficient (IC) 12-month moving average. Source: DataYes, HKSCC, Wind, UBS Quant Research

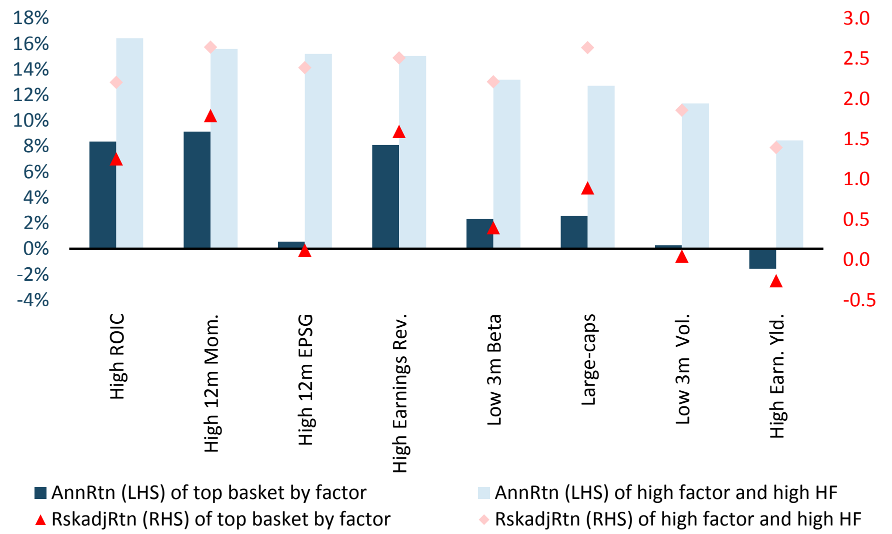
In the following section, we double sort the universe by factors and by the composite score of hedge fund insights. We present the results in Figure 52. The results show annualised excess returns relative to the benchmark of the top 50% of names. The dark blue line corresponds to the ranking of the generic quant factor, while the light blue line corresponds to the enhance factor using both the quant/style score and the hedge fund insights composite score.

As previously stated, most generic factors have outperformed the benchmark over the backtest period, with the exception of Growth and Value. It can be seen that all styles benefit from insights overlay. They have all delivered greater yield and risk-adjusted returns. Following the smart money would have made quant/style factors 'smarter'.

Among the most significant improvement documented, we highlight that enhanced Value and enhanced Growth have significant and large positive returns For the Value factor, for instance, we are now able to identify which value stocks are likely to re-rate and which are potential value traps. Therefore although cheap stocks overall have underperformed, those with high hedge fund preference score have outperformed over the backtest period.

Quality is another factor that benefits from using the hedge fund (HF) composite signal. The annualised excess return increased from 7% to 13%. The Sharpe Ratio also doubles from 1.3 to 2.2 over the backtested period (since December 2016).

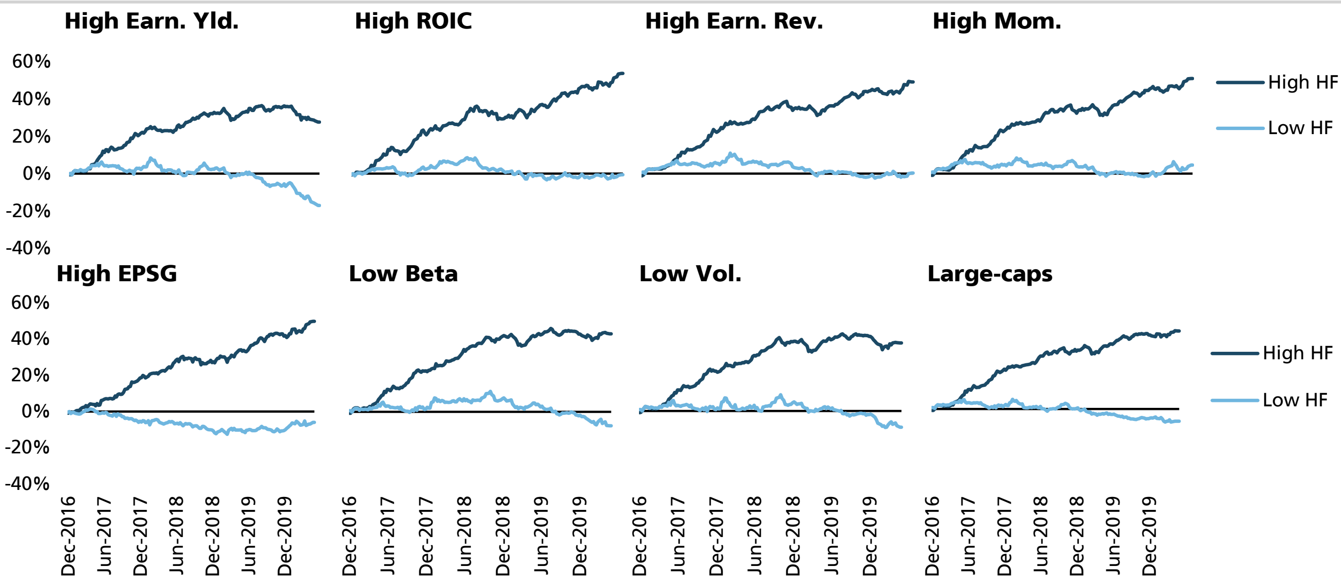
Figure 52: Performance of generic factors enhanced by hedge fund insights



Note: UBS Quant Research's top basket of generic factors. Back test period is since Dec 2016, and excess return is portfolio return relative to benchmark return of Northbound market index; all returns are calculated based on total returns in USD.
Source: DataYes, HKSCC, Wind, UBS Quant Research

Consistent with Figure 52, we present in Figure 53 the relative performance of baskets with both high and low hedge fund scores in the intuitively favourable basket sorted by factors. It is interesting to observe that stocks with desirable factor scores but low HF scores have near 0 yield, which is consistent with our previous remark on how low active weights differ from the short basket.

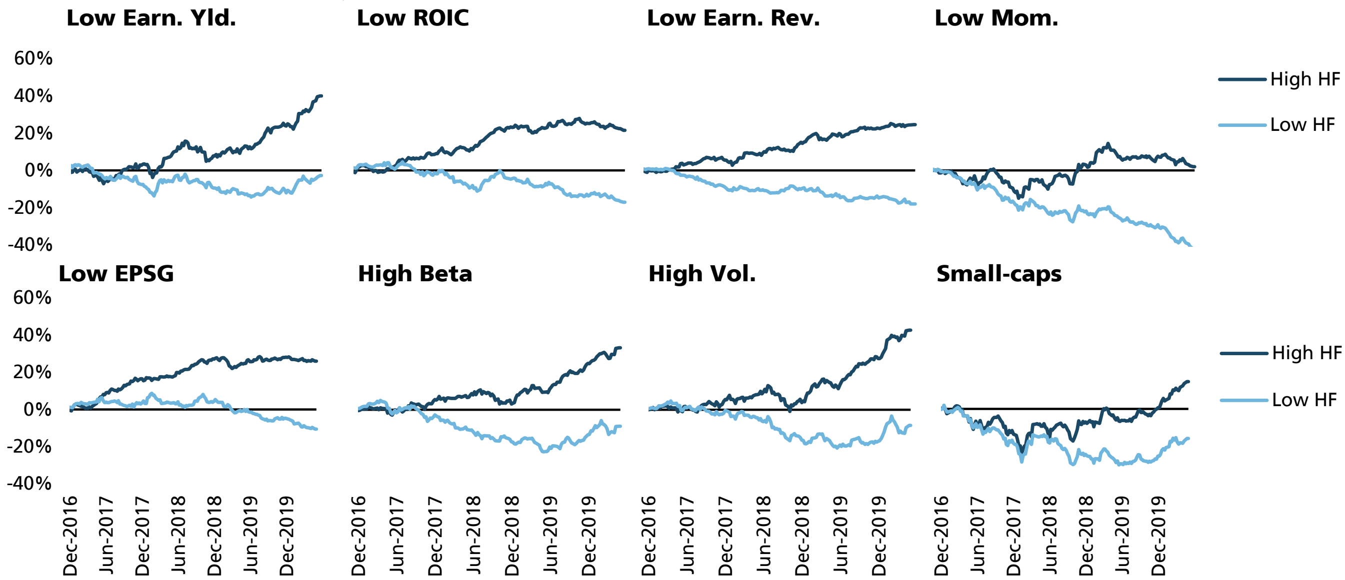
Figure 53: Hedge funds' idiosyncratic insights in intuitively favorable factors



Source: DataYes, HKSCC, Wind, UBS Quant Research

It is also interesting that even in undesirable baskets sorted by factors (Figure 54), hedge funds exhibit an information advantage. For example, among all expensive stocks, hedge fund investors can identify names that could outperform and tell apart winners from losers. This is true in all factors reported with the exception of Small-caps and Low Momentum. A potential explanation is that hedge funds tend to be contrarian traders and good at exploiting the inefficient part of the market, and find stock opportunities regardless of factor exposures.

Figure 54: Hedge fund insights in intuitively undesirable factors



Source: DataYes, HKSCC, Wind, UBS Quant Research

Latest screens

In summary, we demonstrate that among all Stock Connect Northbound investors, hedge fund investors are likely more skilled at capturing stock-specific returns. Based on their stock-specific insights, as measured by funds' positioning (active weights) and trading (change in active weights), we built a composite trading signal. The signal is used to implement a stock screen in sector as well as to improve the performance of traditional quant factors.

In particular, our backtests show that hedge funds have brought greater information advantage in sectors with higher idiosyncratic risk, ie, where more stock opportunities are available. We are able to create smarter factors by incorporating stock-specific expertise and improve all quant factor performance.

Based on the findings above, we produce stock screens by sector and by style (Figure 55 and Figure 56), presenting the top three names in each category sorted by the composite score of hedge fund expertise. In these screens, we highlight the subset of sectors and styles where hedge funds have greater expertise and where the composite model has generated higher excess returns. If you are interested in our model screening in more sectors and styles, please let us know.

Figure 55: Top screens from our model, in sectors with more stock opportunities

Sector	Ticker	Company	Market cap (US$ bn)	Active weight	WoW chg in active weight
Industrials	300750	CATL	24.0	0.63%	0.08%
Industrials	600004	BAIYUN AIRPORT	4.3	0.03%	0.02%
Industrials	002468	STO EXPRESS	3.6	0.00%	0.02%
Materials	601899	ZIJIN MINING	10.6	0.04%	0.01%
Materials	600803	ENN ECOLOGICAL	1.7	0.06%	0.01%
Materials	600426	HUALU-HENGSHENG	4.0	0.05%	0.02%
Info. Tech.	603501	WILLSEMI	4.1	0.13%	0.06%
Info. Tech.	002410	GLODON	6.5	0.61%	0.12%
Info. Tech.	000938	UNIS	11.2	0.01%	0.13%
Cons. Disc.	002027	FOCUS MEDIA	9.8	0.20%	0.03%
Cons. Disc.	000333	MIDEA GROUP	54.7	1.35%	0.11%
Cons. Disc.	600859	WANGFUJING	1.6	0.03%	0.02%
Cons. Stpls.	002299	SUNNER	3.8	0.10%	0.04%
Cons. Stpls.	600600	TSINGTAO BREWERY	5.7	0.14%	0.07%
Cons. Stpls.	300146	BY-HEALTH	2.2	0.08%	0.01%

Note: We report the latest screen, as of 22 May 2020, in the top sectors where there have been more stock opportunities available and therefore the smart money insights have performed better. Screening is based on a composite score of both positioning and trading, as in active weight and week-over-week changes (WoW Chg). Back test is on a basis of weekly rebalance, so screen is valid for one week.

Source: DataYes, HKSCC, MSCI, Wind, UBS Quant Research

Figure 56: Top screens in styles where hedge funds had greater expertise

Style	Ticker	Company	Market cap (US$ bn)	Active weight	WoW chg in active weight
High Quality	002027	FOCUS MEDIA	9.8	0.20%	0.03%
High Quality	000002	VANKE-A	34.2	0.72%	0.04%
High Quality	000333	MIDEA GROUP	54.7	1.35%	0.11%
High Momentum	000002	VANKE-A	34.2	0.72%	0.04%
High Momentum	000333	MIDEA GROUP	54.7	1.35%	0.11%
High Momentum	603501	WILLSEMI	4.1	0.13%	0.06%
High Growth	000002	VANKE-A	34.2	0.72%	0.04%
High Growth	000333	MIDEA GROUP	54.7	1.35%	0.11%
High Growth	600859	WANGFUJING	1.6	0.03%	0.02%
High Beta	002027	FOCUS MEDIA	9.8	0.20%	0.03%
High Beta	603501	WILLSEMI	4.1	0.13%	0.06%
High Beta	300750	CATL	24.0	0.63%	0.08%
High Volatility	603501	WILLSEMI	4.1	0.13%	0.06%
High Volatility	002410	GLODON	6.5	0.61%	0.12%
High Volatility	300750	CATL	24.0	0.63%	0.08%

Note: We report the latest screening in styles where hedge funds have more information advantage. Backtest is on a basis of weekly rebalance, and screen is valid for one week. Data as of 22 May 2020.
Source: DataYes, HKSCC, MSCI, Wind, UBS Quant Research

Appendix

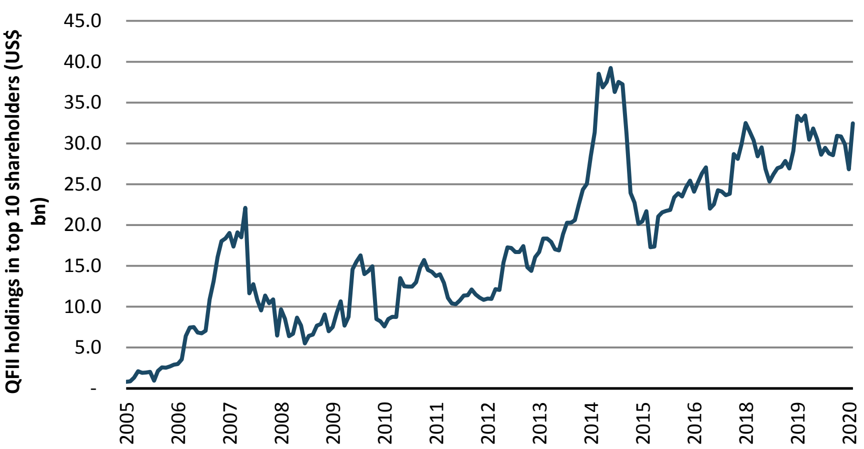
Insights from QFII top holdings

We base our research on the quarterly financial reports of China A-share listed companies (Figure 18). HKSCC releases the top 10 names among all shareholders. We specifically look at the holdings of QFII investors.

The market value of QFII holdings peaked at the end of 2014. After 2014, with the launch of the Stock Connect Scheme, foreign investors started to have an alternative and a relatively more flexible way to trade in the onshore market. As a result, the growth in QFII holdings slowed.

According to latest Q120 financial reports, QFII investors ranked in the top-10 shareholder list of 410 A-share listed companies, with a total asset size of US$32bn. In terms of market value, this dataset covers around 52% of total QFII investor holdings in China, which in total amounted around US$62bn, according to the State Administration of Foreign Exchange (see Figure 15).

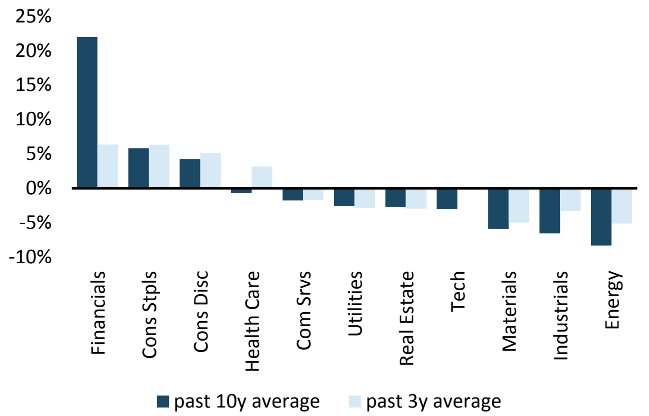
Figure 57: Total market value of QFII holdings among top 10 shareholders of A-share listed companies



Note: Data as of March 2020. Source: Wind, UBS Quantitative Research

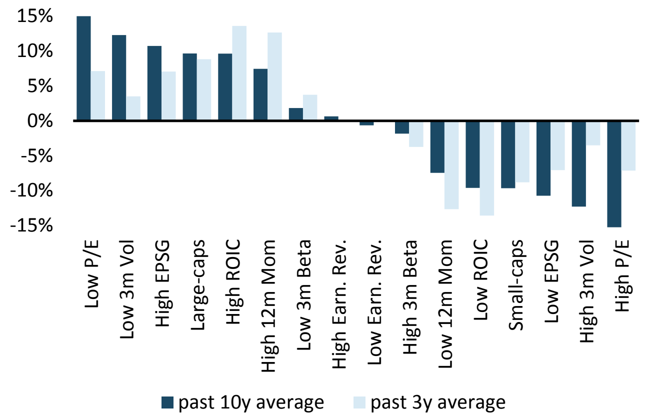
Sector wise, QFII investors have been significantly overweight Financials over the past 10 years, by as much as 22%. Over the past three years, however, although the Financials, Consumer Staples, and Consumer Discretionary sectors still ranked as the top three overweight sectors, the percentage of overweight in Financials has declined (Figure 58). In terms of style preferences, QFII investors consistently prefer Value, Low Volatility and Growth. Over the past three year, they have increased their weight in Quality and Momentum (Figure 59).

Figure 58: Aggregate active weight by sector



Note: Above chart reports the active sector weights, calculated relative to the sector weights in China A shares.
Source: FactSet, Wind, UBS Quantitative Research

Figure 59: Aggregate active weight by style

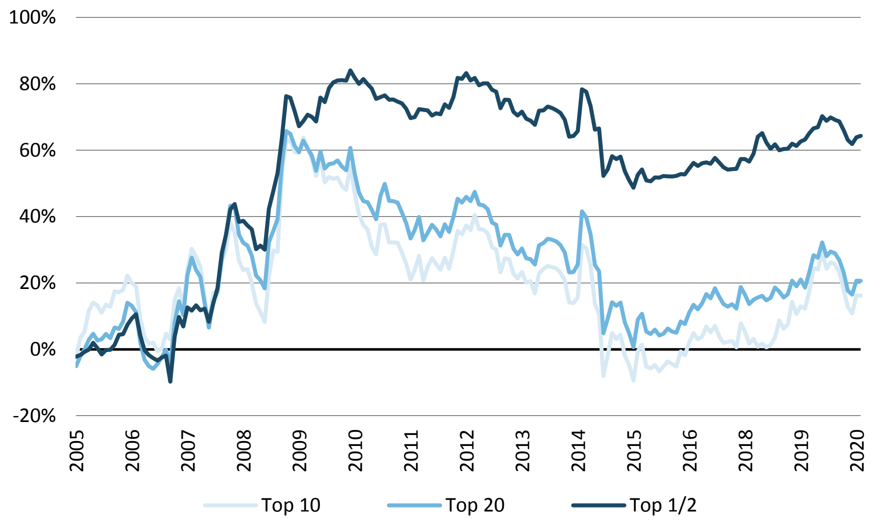


Note: Above chart reports the active style weights, calculated relative to the style weights in China A shares.
Source: FactSet, Wind, UBS Quantitative Research

By regressing out sector and style exposures from QFII investor positioning, we are left with their stock-specific idiosyncratic insights. We built a stock screen model based on the insights and found that relative to the China A-share benchmark, the stocks favoured by QFII investors have not delivered consistent outperformance over the long-term backtested period, and especially no outperformance in the past decade.

In conclusion, we cannot find an exploitable information advantage from QFII investors in aggregate, probably due to the low coverage of holding data.

Figure 60: Performance of stocks favoured by QFII investors



Note: Backtest is from 2005 to 2020, relative to cap-weighted benchmark of all China A shares.
Source: FactSet, Wind, UBS Quantitative Research

Top CCASS participants

Figure 61: Top CCASS participants in the Northbound scheme

Type	Participant	Holding value (US$ bn)	Market share
Custodian	HSBC	63.4	30%
Custodian	SCB	39.1	19%
Custodian	JPM CHASE	33.6	16%
Custodian	Citi	18.7	9%
Broker	MS	8.6	4%
Broker	MLFE	8.3	4%
Broker	UBS	6.6	3%
Broker	CICC	5.3	3%
Broker	JPM BROKING	5.0	2%
Broker	GS	4.9	2%

Note: Data as of 15 May 2020. Source: DataYes, HKEX, HKSCC, UBS Quant Research

Definition of styles and 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 the market capitalisation, book-to-price ratio, and dividend yield. Style performance is calculated as the difference between outperformers (high basket) and the benchmark (typically high minus benchmark, or indicated by an asterisk [*] if low minus benchmark). Portfolio returns are based on free-float market capitalisation weighted average of total returns in US dollar.

Figure 62: Factor definitions

Type	Name	Definition
Value	Earnings Yield	The inverse of the 12m forward P/BV multiple
Growth	Historical EPS Growth	The average EPS growth in the trailing 12 months
Earnings	3M Earnings Momentum	The percentage change in forecast EPS over the previous 3 months
Momentum	12M Price Momentum	The -12m to -1m local price return, for the 'current' month-end
Quality	ROIC	EBIT / Invested Capital
Size	Large Cap	The month-end free-float market cap, large-cap basket minus benchmark
Volatility*	Volatility 3M	Volatility of daily total returns on trading days over the past 3 months
Beta*	Beta 3M	Average Beta over the past 3 months

Source: UBS Quant Research

List of quantitative research

Thematic models

Title	Date
Holistic View on Commodity Crowding	Apr-20
Factor Performance and Valuations	Apr-20
Higher Volatility: Where to next? The search for balance sheet strength	Apr-20
The rise of active management: How to use fundamental insights	Mar-20
Alpha with downside liquidity	Feb-20
Coronavirus – A quant perspective: what could history teach us?	Feb-20
Commodity crowding: a holistic view	Feb-20
Factor momentum: what works?	Jan-20
ESG Investing: "Sin" stock exclusions	Oct-19
Smarter Factor Investing	Sep-19
Transaction cost models	Sep-19
What you need to know about quant investing in China	Jun-19
2019 H2…Increasing Volatility? Country, sector, factor and stocks	Jun-19
Exploring ESG Ratings	Jun-19
Single Stock Skewness	May-19
A guide to MSCI China A-share inclusion from a quantitative perspective	Apr-19
Timing cross asset momentum with crowding	Mar-19
Is there information in the value spread	Mar-19
CEO turnover: What is the impact on stocks and how to trade them?	Feb-19
Factor trends, seasonality and horizons	Feb-19
Where's the alpha in 2019? Stock selection and sector rotation model	Feb-19
Do retail investors move China's equity market?	Nov-18

Standard quant factors

Monthly and weekly products	Date
China Style Guide: High Earning stocks rallied in earnings season while Value stocks broke down	May-20
Asia Style Guide: Large caps bounce while low risk falls	May-20
Global Style Watch: High Value hit while risk-high outperforms	May-20
UBS Style Ideas: The best ideas from our quant models	May-20
UBS Crowding Barometer	May-20
Top 10 crowded trades: Where are the largest active positions?	May-20
UBS Quantitative Sector Rotation Model	May-20
Factor Performance and Valuations	May-20
Australia and New Zealand Equity Research: Quantitative Review	May-20

Academic Research Monitor

Title	Date
A Review of the Value Shortfall	May-20
UBS Quantitative Conference Highlights, 2019	Apr-19
Factor Timing	Mar-19
Buybacks	Feb-19
Hedge Fund Replication	Jan-19
Revisiting Value	Dec-18
UBS Future of Active Management Conference	Nov-19
UBS Australia Quantitative Conference	Oct-18
Consider Correlations	Oct-18
Machine Learning Everywhere	Jul-18
Forecasting Returns	Jun-18
Rebalancing Risks	May-18
UBS Quantitative Conference Highlights	Mar-18
Advances in Momentum Investing	Mar-18

PAS User Guides and R Advice

Monthly and weekly products	Date
PAS Macros	Feb-16
Quick Reference Guide	Nov-15
Risk Parity and Composite Assets	Jan-15
Introduction to the UBS Portfolio Analysis System	Jan-15
Long-Short Analysis	Jan-15
Installation	May-14
R and Python: Working Together	Apr-19
Getting started with deep learning in TensorFlow	Jan-18
A quick tutorial in 'nowcasting'	Oct-17
Conventional active returns can be misleading	Sep-17
Predictive modelling with caret	Jul-17
Tidy data science with the tidyverse	May-17
Bayesian regressions with stan	Mar-17
data.table, the best package in the world?	Mar-17

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Buy	FSR is > 6% above the MRA.	48%	32%
Neutral	FSR is between -6% and 6% of the MRA.	40%	28%
Sell	FSR is > 6% below the MRA.	13%	20%
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 31 March 2020.
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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