UBS

Global Research

29 October 2020

Quantitative Monographs

Who is the smart money in China? Part II: onshore mutual funds

Equities

China

Quantitative

Cathy Fang, PhD
Analyst
S1460518100001
cathy.fang@ubssecurities.com
+86-213-866 8891

Lynce Wang
Associate
lynce.wang@ubssecurities.com
+86-21-3866 8638

Paul Winter
Analyst
paul-j.winter@ubs.com
+61-2-9324 2080

Fabrice Schloegel, PhD
Analyst
fabrice.schloegel@ubs.com
+852-2971 6118

Aaron Guo
Associate Analyst
aaron.guo@ubs.com
+852-2971 7705

Oliver Antrobus, CFA
Analyst
oliver.antrobus@ubs.com
+61-3-9242 6467

Luke Brown, CFA
Analyst
luke.brown@ubs.com
+61-2-9324 3620

James Cameron
Analyst
james-a.cameron@ubs.com
+61-2-9324 2074

Amanda Jorgensen
Analyst
amanda.jorgensen@ubs.com
+44-20 7568 3072

Andreas Schroeder, CFA
Analyst
andreas.schroeder@ubs.com
+44-20-7568 4432

Ashley Shi
Associate Analyst
ashley.shi@ubs.com
+61-2-9324 3862

Pieter Stoltz
Analyst
pieter.stoltz@ubs.com
+61-2-9324 3779

Are active fund managers skilful in China?

As of 2020, China's onshore mutual fund industry has gone through 22 years of rapid development. Among all the asset managers in the industry, we found evidence that historically on average the 20% top-ranked active managers had the skills to differentiate themselves from passive managers, i.e. to add value. More importantly, our back-test shows that an experienced active fund manager who has recently performed well is more likely to deliver superior returns in the subsequent time period. Therefore, we are able to identify a subset of potential outperformers based on funds' prior performance and fund manager characteristics.

Where does the expertise lie?

We study the expertise of the subset of selected funds, in terms of both sector and style timing and stock selection. Firstly, based on fund managers' positions in sectors and styles, we devise a timing model that would have generated an excess return of 9% (sector timing) and 5% (style timing) per annum since 2015. Our back-tests show that active fund managers in China generally have more expertise in sectors such as industrials, health care and materials, where there is a higher level of stock opportunity. Moreover, a stock selection model based on fund positions would have returned 15% per annum in the top long basket and 16% in the short basket during the past five years, gross of trading costs. Lastly, by incorporating fund managers' expertise, we created a set of enhanced quant factors in China, with Earnings, Quality and Growth benefiting the most.

Screens based on smart money insights

To continue monitoring investor positions in China, we are launching: 1) a quarterly screen based on a selected group of China onshore mutual fund managers (top picks in Figure 1); and 2) weekly screens based on the positions of Northbound hedge funds and Northbound mutual funds (read Part I of "Who is the smart money in China?"). If you are interested in the full screens, please contact us.

Figure 1: Top and bottom screens from our model

	Ticker	Company Name	Sector	Market Cap (Rmb bn)	Mutual Fund %Hold	Mutual Fund QoQ Chg in %Hold
Long	300124	INOVANCE	Industrials	86.8	4.65%	0.72%
	002444	GREAT STAR	Industrials	26.9	1.02%	0.67%
	600660	FUYAO	Cons Disc	67.2	0.65%	0.64%
	601877	CHINT	Industrials	66.7	0.68%	0.54%
	600176	JUSHI	Materials	48.8	0.56%	0.41%
Short	601878	ZHESHANG SECURITIES	Financials	53.6	0.0003%	-0.07%
	601818	CEB BANK	Financials	156.5	0.0004%	-0.06%
	600028	SINOPEC	Energy	370.8	0.0008%	-0.05%
	601788	EVERBRIGHT SECURITIES	Financials	72.7	0.0014%	-0.01%
	600050	CHINA UNICOM	Com Srvs	104.3	0.0016%	-0.004%

Note: This screen is based on the holdings of a subset of potential outperformers among all active fund managers in China; portfolio is quarterly rebalanced according to holding disclosure at each quarter end; data as of Q320. Source: Wind, UBS Quant Research

Executive summary

In this report, we provide a comprehensive study on how to evaluate the skills of an active mutual fund manager in China. We essentially aim to identify potential outperformers and to integrate their idiosyncratic insights into quant investing.

Figure 2: How to evaluate the skills of an active fund manager?

Fund Performance	Fund Characteristics	Timing Skills	Stock Selection
• Absolute after-fee return, relative return, alpha; • Volatility, drawdown, risk-adjusted performance; • Persistency, momentum in various horizons; • Risk models, performance attribution, etc.	• Fund type, age, size; • Fund investor structure; • Fund manager: tenure, gender, education, nationality, incentive compensation, etc.	• Asset allocation • Style exposure • Sector exposure	• Absolute holdings, relative weights, level of crowding, flows, best ideas, etc. • Turnover ratio • Holding concentration

Source: UBS Quant Research

Can fund managers add value?

We start with the most commonly debated question regarding the asset management industry: can active fund managers add value for fund investors? We found evidence that during the 22-year history of China's onshore mutual fund industry, top-ranking asset managers have been able to generate positive alpha, net of fees, i.e. they add value for fund investors.

Who is the smart money?

Then we focus on how to evaluate fund manager skills and how to identify the funds that are more likely to deliver superior returns in the future. Our back-test shows that historically, as the asset management industry evolves:

- To invest in experienced fund managers (**long tracking record**), who have recently performed well (**past one-year performance**) is one way to identify potential future outperformers.

Based on these findings, we pick a subset of funds with high past one-year alpha and long-serving fund managers. Our back-test shows that historically these funds have generally performed better than peers in the subsequent time period.

How to use their insights?

With the subset of potential outperformers identified, we incorporate their insights into our timing models, as well as stock selection models.

- **Sector and style timing models** based on signals from mutual fund preferences would have respectively generated excess returns of 9% and 5% per annum in the past five years.

- A **stock selection model** based on mutual fund positions would have returned 15% per annum in the top long basket, 16% per annum in the short side, since 2015, with a Sharpe ratio of 0.7 and 1.2, respectively. Moreover, fund managers in China generally have more expertise in sectors such as industrial, health care, and materials where there is a higher level of idiosyncratic risk, i.e. more stock opportunities.

- Lastly, by **integrating fund managers' insights into quant factors**, we create a set of enhanced quant factors in China and show that Earnings, Quality, and Growth benefit the most.

Industry overview

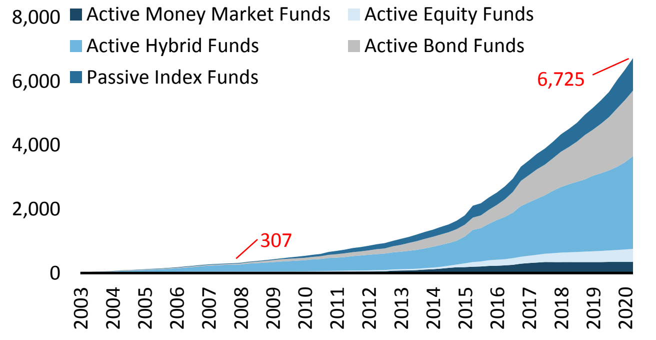
Since its inception in 1998, the mutual fund industry in China has gone through 22 years of significant changes and steady developments.

A young industry with steady growth

Yet, China's onshore mutual fund industry is still in its infancy, compared with its hundred-year-old counterparty in the US. Back in 2007, there were only 307 fund products launched in China (Figure 3), with net assets under management that at the time peaked at Rmb3trn (Figure 4). The industry remained stable but without growth for several years and it was not until 2014 that we started to see significant growth. In comparison, the net assets in the US mutual fund industry had exceeded US$12trn as of 2007, and reached US$20trn in 2020 (Figure 5 in report), which is around 7 times larger than that in China.

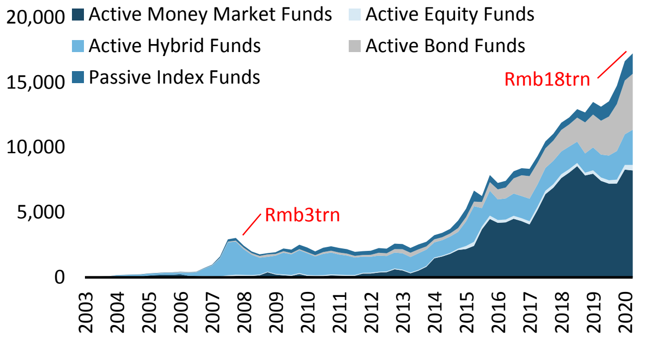
On the other hand, although it is still young, China's mutual fund industry has grown rapidly in the past decade. Among actively-managed funds, net assets under management increased from Rmb2trn in 2010 to Rmb18trn as of H120, with an exceptionally high growth rate of 50% in 2015 and 30% in 2020 year-to-date. The total number of active funds has reached 6,725 recently. The active-to-passive ratio, the growth rate, as well as the evolving status of the industry have been fairly comparable to the US asset management industry before the global financial crisis (GFC) (Figure 7 in report).

Figure 3: Total number of products in China's onshore mutual fund industry



Source: Wind, UBS Quant Research

Figure 4: Net assets under management in China's onshore mutual fund industry (Rmb bn)



Source: Wind, UBS Quant Research

Mutual funds in China have now become one of the largest institutional investors. They play a leading role especially in the domestic equity market, with a wide stock coverage.

A leading institutional investor with wide stock coverage

As shown in Figure 4 and Figure 5, the onshore fund managers have an equity holding of more than Rmb2.3trn in their top 10 holdings. As of H120, the top holding portfolios covered more than 1,500 A-share stocks out of all nearly 4,000 listed companies and almost all CSI300 index constituents (281 out of 300). In terms of free-float market cap, more than 80% of all China A shares and 98% in CSI300 are covered by mutual fund holdings.

The onshore fund managers are also gaining market share in the offshore Hong Kong market. Since the launch of the Stock Connect Scheme in November 2014, more and more Hong Kong-listed companies have become top holdings of onshore fund managers. In 2020, they maintained a coverage of more than 200 stocks in Hong Kong, covering more than 70% of all the constituents of the Hang Seng Composite Index.

Figure 5: Stock coverage of mutual funds' top 10 holding portfolios

	Total	Top equity holdings			A-shares			CSI300 Constituents			HK-listed Stocks		
	# of funds	# of Stocks	HldValue (Rmb bn)	Top 10 as % of All Holdings	# of Stocks	HldValue (Rmb bn)	Stock Coverage in all A-shares	# of Stocks	HldValue (Rmb bn)	Stock Coverage in CSI300	# of Stocks	HldValue (Rmb bn)	Stock Coverage in HSCI
2005	223	239	127	57%	239	127	51%	128	116	68%	-	-	-
2006	312	275	331	59%	275	331	68%	157	312	76%	-	-	-
2007	348	354	1,188	50%	354	1,188	72%	186	1,099	82%	-	-	-
2008	444	366	438	55%	366	438	65%	171	392	83%	-	-	-
2009	554	544	865	50%	544	865	70%	219	792	87%	-	-	-
2010	720	790	845	54%	790	845	72%	228	655	90%	-	-	-
2011	914	830	677	60%	830	677	73%	234	551	92%	-	-	-
2012	1,193	815	675	53%	815	675	73%	245	567	94%	-	-	-
2013	1,568	927	672	55%	927	672	73%	256	482	95%	-	-	-
2014	1,928	1,219	836	57%	1,219	836	78%	276	608	97%	-	-	-
2015	2,721	1,820	1,089	58%	1,798	1,089	82%	280	529	98%	22	1	34%
2016	3,881	2,133	1,023	59%	2,064	1,012	83%	290	535	99%	69	12	57%
2017	4,732	1,665	1,228	61%	1,546	1,204	81%	283	844	99%	119	24	71%
2018	5,214	1,663	994	60%	1,469	965	82%	282	704	99%	194	29	80%
2019	6,158	1,621	1,680	56%	1,422	1,631	80%	284	1,231	99%	199	49	75%
2020H1	6,725	1,706	2,297	55%	1,505	2,210	80%	281	1,557	98%	201	87	72%

Note: This table is based on the top 10 equity holdings released in mutual fund quarterly reports. The column of "Top 10 as % of All Holdings" is calculated by the market value of top 10 holdings divided by the market value of all equity holdings, in each fund, and takes an average across funds. It indicates that mutual fund managers generally have fairly concentrated holdings, so that on average, their top-10 portfolios represent more than 55% of all holdings. The three columns of "coverage" in different universes stand for the stock coverage of mutual fund top holdings calculated in terms of free-float market cap. The three columns of "HK-listed Stocks" are empty before 2014 because the Southbound Stock Connect Schemes was not launched until November 2014 (report).
Source: Wind, UBS Quant Research

Data description

Transparent

Mutual funds are one of the most transparent institutional investors in China. The China Securities Regulatory Commission (CSRC) and the Asset Management Association of China (AMAC) require mutual fund managers to release: 1) a quarterly fund report with their top 10 holdings no later than 15 working days after each quarter end, 2) a semi-annual report with full holdings within 60 calendar days after the end of H1, and 3) an annual report with full holdings within 90 calendar days after year end.

We use data of top 10 holdings released quarterly

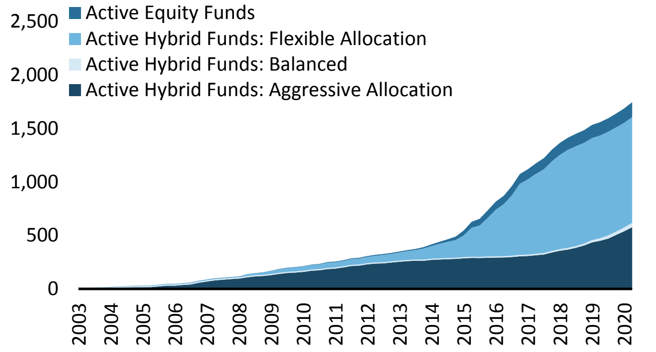
In the quarterly fund reports, fund managers need to provide detailed information on: 1) fund investment styles, 2) fund manager biography, 3) fund performance and net values, as well as 4) the top 10 equity holdings ranked by market value.

Our main dataset consists of the top 10 equity holdings, of each fund, at the end of each quarter, since 2005. We believe this dataset provides a good representation of fund manager investment behaviour. Although it covers only their top 10 out of all equity holdings, it should be noted that the market value of top 10 holdings represents more than 50% of the total market value of all fund holdings, as shown in Figure 5. It also indicates that to some extent the holdings of China mutual fund managers have been fairly concentrated.

Fund types

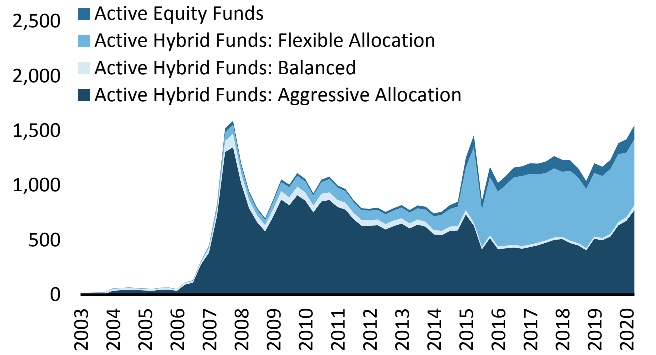
In this report, we aim to examine the active fund managers and their expertise in equity investment. Therefore, our sample contains actively-managed equity funds and hybrid funds with reasonable exposures to equity assets; passive funds are excluded. Please refer to Appendix: Definitions of mutual fund types for more details on fund types and equity exposures. More precisely, Figure 6 and Figure 7 summarise the fund types in our sample, as well as sample numbers and net assets by type. For each fund type, CSRC provides a list of regulations and requirements for their investment behaviour and equity exposures.

Figure 6: Number of fund products by type



Source: Wind, UBS Quant Research

Figure 7: Net assets by fund type (Rmb bn)



Source: Wind, UBS Quant Research

In addition to equity exposure in each fund types, another unique regulation for China's domestic mutual funds is that once launched, each fund manager shall decide their investment style and choose a corresponding index as performance benchmark. Figure 8 displays the sample numbers with different benchmarks.

Funds benchmarked to large-cap equity index

In later sections, we focus on fund samples benchmarked to large-cap equities, i.e. funds benchmarked to the CSI300 Index. We choose this sample as it essentially equips us with a more investable universe of China A shares for global investors, in terms of trading liquidity, fund capacity, transaction costs, etc. Also, in this note we want to focus on fund managers' stock picking skills, so we exclude small-cap funds, or thematic funds that are anchored on a specific sector, style or theme, which are subject to higher style-level risk exposures.

Figure 8: Number of funds with different benchmarks

		Active Hybrid Funds	Active Equity Funds	Passive Equity Funds	Total
A-shares	CSI300	1,881	139	91	2,111
	CSI500	64	21	62	147
	CSI800	220	45	7	272
HK-listed	Hang Seng Index	211	33	-	244
	HSCI	35	13	-	48
Global index	FSTE	57	2	6	65
	S&P	64	1	7	72
	MSCI	23	6	39	68
Thematic index	Others*	306	139	672	1,117

Note: This table displays equity and equity-related funds, with different fund benchmark indices; and "others" represents thematic fund products that focus on a specific sector, style or theme. Data as of H120.
Source: Wind, UBS Quant Research

Stock coverage in our sample

In Figure 9 we summarise the stock coverage within our fund sample, i.e. the actively-manged equity and hybrid funds that are benchmarked to CSI300 Index. The top holding dataset covers a total of 1,231 stocks as of H120, including 1,117 China A shares, 247 CSI300 index constituents, as well as 114 HK-listed stocks. In terms of free-float market cap, the sample covers 72% of the A-share market, 94% of the CSI300 Index, and 48% of the Hang Seng Composite Index.

Figure 9: Stock coverage and market share in our sample

	Total	Top equity holdings			A-shares			CSI300 Constituents			HK-listed Stocks		
	# of funds	# of Stocks	HldValue (Rmb bn)	Top 10 as % of All Holdings	# of Stocks	HldValue (Rmb bn)	Stock Coverage in all A-shares	# of Stocks	HldValue (Rmb bn)	Stock Coverage in CSI300	# of Stocks	HldValue (Rmb bn)	Stock Coverage in HSCI
2005	54	134	24	55%	134	24	40%	88	22	57%	-	-	-
2006	85	168	79	55%	168	79	53%	110	74	65%	-	-	-
2007	123	202	604	45%	202	604	61%	135	566	72%	-	-	-
2008	169	273	237	50%	273	237	61%	146	216	78%	-	-	-
2009	228	352	445	43%	352	445	62%	189	415	82%	-	-	-
2010	280	549	427	43%	549	427	60%	189	333	80%	-	-	-
2011	325	593	337	48%	593	337	66%	194	269	83%	-	-	-
2012	378	599	341	48%	599	341	66%	210	284	87%	-	-	-
2013	441	667	350	52%	667	350	59%	198	239	85%	-	-	-
2014	545	914	373	53%	914	373	70%	240	248	91%	-	-	-
2015	831	1,415	404	56%	1,406	404	71%	228	151	89%	9	0	2%
2016	1,331	1,737	377	60%	1,675	366	75%	265	148	95%	62	10	54%
2017	1,710	1,306	528	63%	1,217	509	74%	259	343	96%	89	20	62%
2018	1,772	1,246	379	62%	1,120	360	74%	251	250	94%	126	19	67%
2019	1,935	1,147	626	57%	1,037	596	72%	241	431	94%	110	30	51%
2020H1	2,020	1,231	777	56%	1,117	734	72%	247	506	94%	114	43	48%

Note: This table is based on the top 10 equity holdings released in mutual fund quarterly reports.
Source: Wind, UBS Quant Research

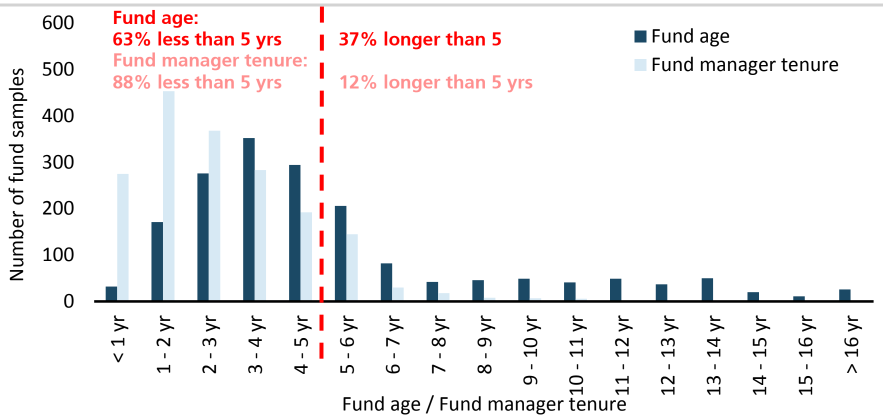
Fund characteristics

In this section, we present a descriptive picture of the funds in our sample. As China's mutual fund industry is still at a very early stage, it is not surprising to observe a relatively short lifespan for fund products (Figure 10), and an even shorter tenure for fund managers (Figure 10).

Manager tenure is short; funds are relatively young…

Figure 10 shows the latest sample distribution by fund age and fund manager tenure. More than 60% of funds were launched less than five years ago, and only 12% of fund managers have served for longer than five years. The average fund lifespan is around five years and the average fund manager tenure is 2.5 years (Figure 14).

Figure 10: Sample distribution sorted by fund age and fund manager tenure



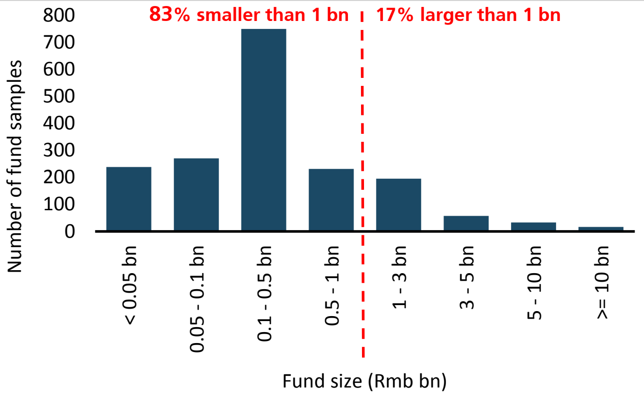
Note: Include actively managed equity and hybrid funds benchmarked to CSI300 Index; data as of H120.
Source: Wind, UBS Quant Research

Moreover, China's onshore mutual fund industry is mostly dominated by funds that manage relatively small AUM. Figure 11 shows that less than 20% of funds have net assets under management larger than Rmb1bn. Figure 12 shows the over time trend in fund sizes. As more new fund products were launched over time, the average fund size has been decreasing.

…and small

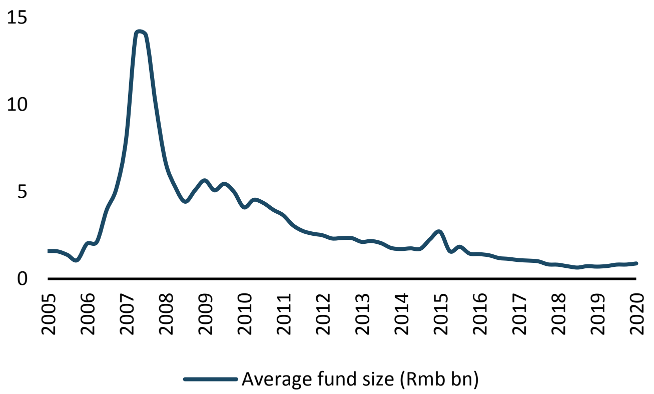
One exception was the year of 2007, when the size of assets per fund peaked at Rmb14bn (Figure 12). We believe that it was partially due to the following: 1) the net value of many equity funds sharply increased during the bull market in 2007, 2) since the equity funds performed so well, many of the existing funds issued new shares, and lastly, 3) tens of new mega funds were launched due to investor excitement in what was a booming market.

Figure 11: Less than 20% of funds are larger than Rmb1bn



Note: Data at of H120; active equity and hybrid funds only.
Source: Wind, UBS Quant Research

Figure 12: Average fund size over time

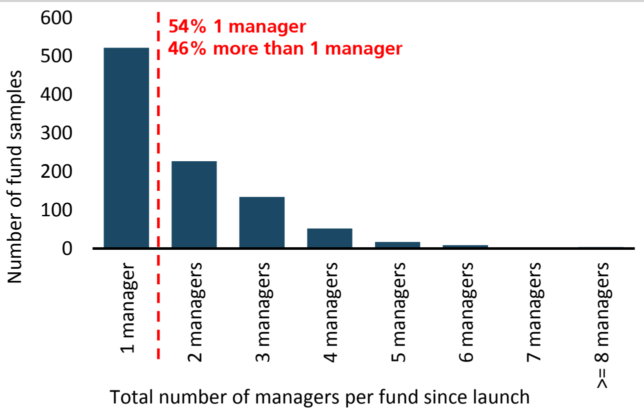


Note: Data at of H120; active equity and hybrid funds only.
Source: Wind, UBS Quant Research

Another interesting finding is that with an average lifespan of five years, more than 50% of funds have changed their fund manager at least once since their launch (Figure 13). Figure 14 further shows that fund age is on average around twice the fund manager tenure. It indicates a high turnover ratio and career volatility among mutual fund managers in the domestic market.

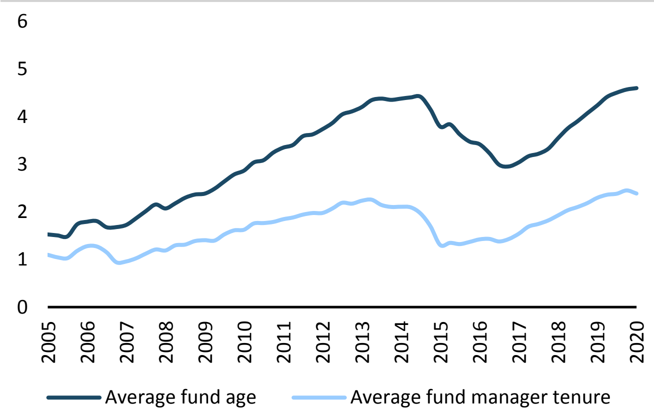
Volatility

Figure 13: With an average fund age of 5 years, half of funds have changed their fund manager for at least once



Note: Data at of H120; active equity and hybrid funds only.
Source: Wind, UBS Quant Research

Figure 14: Average fund age and fund manager tenure over time



Note: Active equity and hybrid funds only.
Source: Wind, UBS Quant Research

The industry is evolving

As shown in Figure 14, back in 2005, the average lifespan of mutual fund products was less than two years; fund manager tenure around one year. Since then, both the average fund age as well as the average fund manager tenure have been increasing over the past years. It indicates an increasing level of maturity across the industry.

Although there was a retreat during 2015-17, due to new fund products launched, the average fund age across the industry has been growing in general, up to more than five years as of 2020. As of recently, fund managers on average have an experience of 2.5 years.

We present more characteristics of mutual funds and fund managers in Appendix: Fund characteristics, including mutual fund investor structure, fund manager holding ratios, fund manager education, etc.

Are China mutual funds skilful?

In this section, we evaluate the skills of an active fund manager, in order to identify potential outperformers in the future. Essentially, we aim to integrate their human insights into quant investing.

Can fund managers add value?

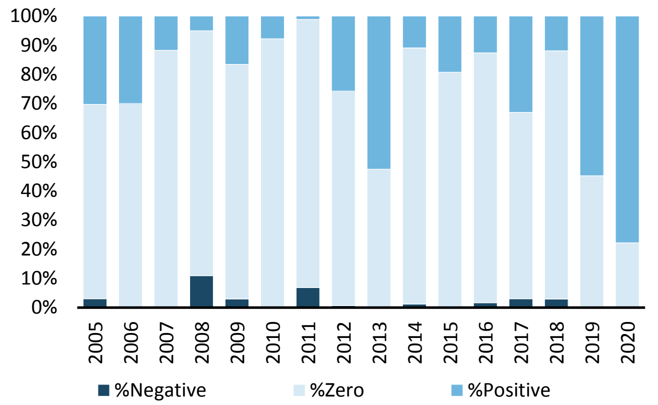
One of the most intensely debated questions regarding the asset management industry is: net of fees, do active fund managers have the skills to differentiate themselves from passive fund managers, i.e. can active fund managers add value?

Top-ranking fund managers can add value

Based on the historical performance of China mutual funds, we found evidence that among all actively-managed funds, on average the top 20% of fund managers have generated significantly positive alpha since 2005 (Figure 15). The percentage of 'skilled' funds fluctuated over time, and it was exceptionally high in the years of 2013, 2019 and 2020 year-to-date.

Moreover, there is a small portion of funds within our sample destroying value (negative alpha in Figure 15), while the rest of active managers, net of fees, are actually in line with passive fund managers (zero alpha).

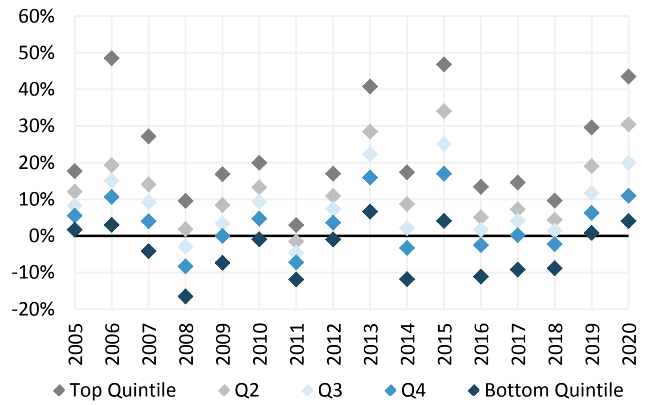
Figure 15: Percentage of mutual funds contributing negative, zero and positive alphas



Note: Alpha is estimated with a rolling one-year of weekly fund performance (after-fees). For performance benchmark, we differ from existing risk models in literature, and use each fund's benchmark index to capture the relative returns in practice; only actively managed equity and hybrid funds are included. Negative, zero and positive alphas are defined at a significance of 10%.

Source: Wind, UBS Quant Research

Figure 16: Annualised alpha contributed by mutual funds in different quintiles



Note: Alpha is estimated with a rolling one-year of weekly fund performance (after-fees). For performance benchmark, we differ from existing risk models in literature, and use each fund's benchmark index to capture the relative returns in practice; only actively managed equity and hybrid funds are included. Average annualised alpha is calculated in each quintile (20%) ranked by fund performance.

Source: Wind, UBS Quant Research

In Figure 16, we sort fund samples into five quintiles based on past one-year alpha and calculate the average in each quintile. Consistent with Figure 15, top-ranking active fund managers significantly outperformed during the years of 2013, 2019, 2020. Despite the significant outperformance in the top quintile during the years in 2006 and 2015, we also document relatively high dispersion in fund performance. Figure 16 displays the level of performance dispersion across different quintiles.

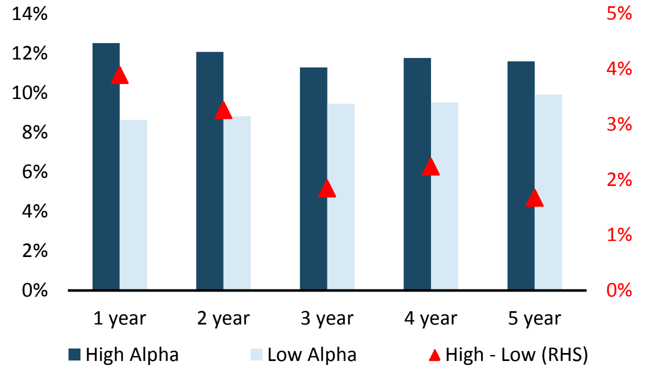
Is the value added persistent?

Past outperformers continue to thrive

In this section, we investigate the persistence in fund performance. Evidence shows that funds with higher alpha in the past are more likely to continue to outperform in the future. Moreover, the persistence is stronger at one year horizon.

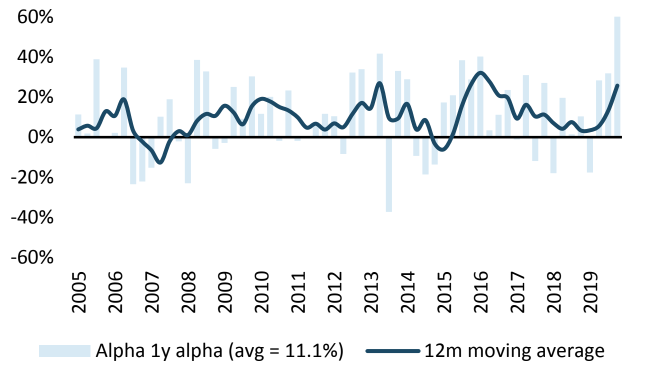
Figure 17 shows that, among all time horizons, the past one-year alpha has the highest correlation with their subsequent fund performance. Funds in the top 1/2 basket with higher past one-year alpha, on average, have provided an annualised return of 12.3%, net of fees, outperforming the bottom basket by 4% per annum since 2010. Rank correlation stays mostly positive over the past 15 years between past one-year alpha and subsequent fund performance (Figure 18).

Figure 17: Subsequent fund performance (after-fees) sorted by prior 1, 2, 3, 4, 5-year alpha



Note: Fund performance is annualised equal-weight return of the change in funds net value per unit (after-fees), quarterly rebalanced since 2010.
Source: Wind, UBS Quant Research

Figure 18: Information coefficient (IC) of previous one-year alpha



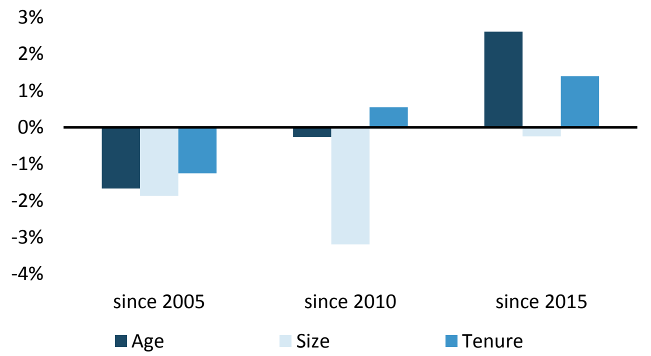
Note: Information ratio is rank correlation between past one-year alpha and the subsequent fund performance (after-fees).
Source: Wind, UBS Quant Research

Fund characteristics and performance

The industry has evolved

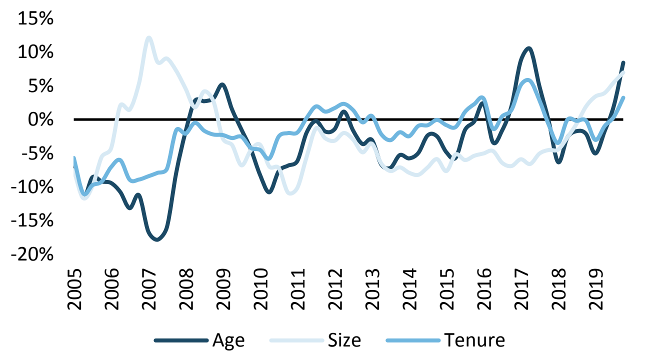
As mentioned in earlier sections, during the early years of the China onshore asset management industry, the industry was dominated by newly launched and small-sized funds (Figure 10).

Figure 19: Rank correlation between fund characteristics and subsequent fund performance (after-fees)



Source: Wind, UBS Quant Research

Figure 20: Rank correlation between fund characteristics and subsequent fund performance over time



Source: Wind, UBS Quant Research

It was then the case that the performance of the relatively new and smaller funds was more attractive compared to their peers with a history of longer than five years or with AUM larger than Rmb1bn (Figure 21 and Figure 22).

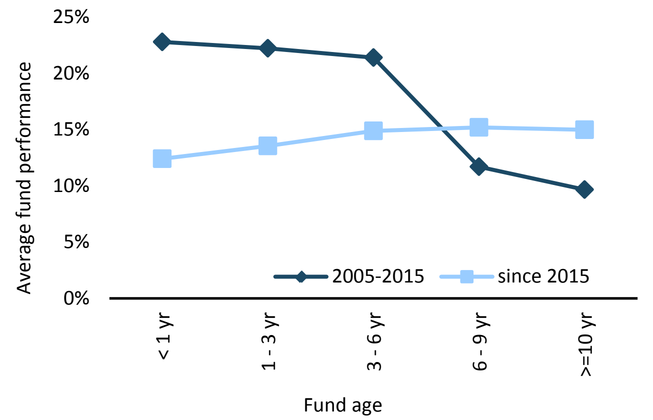
As the industry is becoming more mature, in recent years, a positive relationship between fund age and fund performance has emerged. There is no longer a significantly negative correlation between fund size and performance (Figure 19 and Figure 20).

Figure 21 adds to the story by showing the fund performance in different fund-age baskets. It displays a reversal in trends. Moreover, it also shows that since 2015, the newly launched funds no longer outperform the funds that were launched more than 10 years ago.

Figure 22 further illustrates the relation between fund size and fund performance. It is well documented that before 2015 there was a significant small-cap premium in the China A-share market. Small-sized funds benefitted from that premium, but as fund size grew, stock picking in small caps got limited due to fund capacity and trading liquidity.

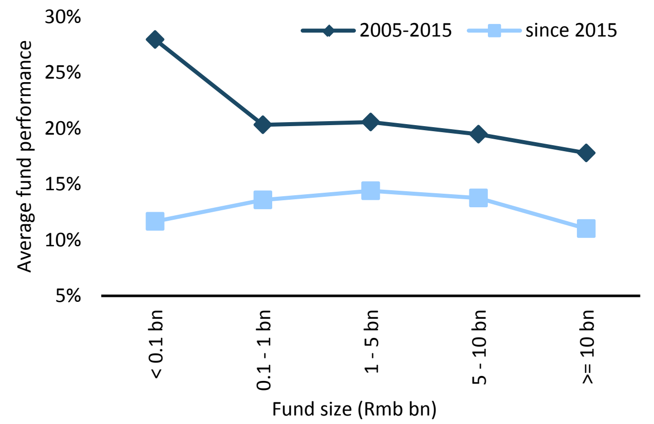
Therefore, before 2015 mutual funds with net assets less than Rmb0.1bn had significantly outperformed peers by almost 10% per annum, which is no longer the case since 2015. Since then, large-cap market leaders in each industry have started to rally in equity markets, and no outperformance in small-sized funds has been documented (Figure 22).

Figure 21: Fund age and subsequent fund performance



Note: Subsequent fund performance is annualised equal-weight returns calculated from the changes in funds net value per unit (after-fees), during the subsequent quarter, average over time.
Source: Wind, UBS Quant Research

Figure 22: Fund size and subsequent fund performance



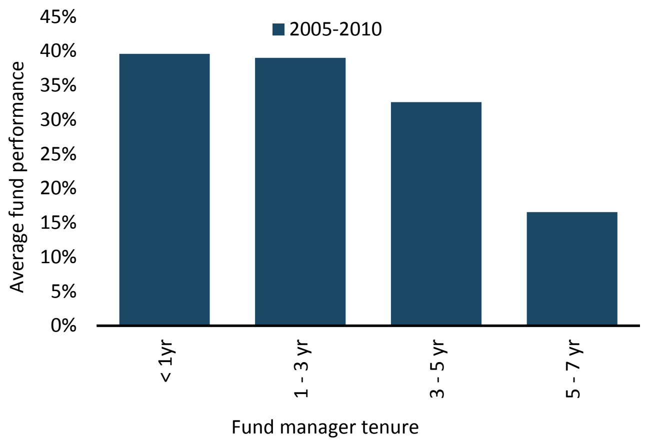
Note: Subsequent fund performance is annualised equal-weight returns calculated from the changes in funds net value per unit (after-fees), during the subsequent quarter, average over time.
Source: Wind, UBS Quant Research

Consistent with previous findings, we observe a similar evolution in the relation between fund manager tenure and fund performance.

Figure 23 and Figure 24 document the average subsequent fund performance sorted by fund manager tenure. Despite a negative relationship during early years (Figure 19 and Figure 23), an asset manager with a richer experience and a longer track record could achieve impressive outperformance relative to their newly-assigned peers in the subsequent time period (Figure 24).

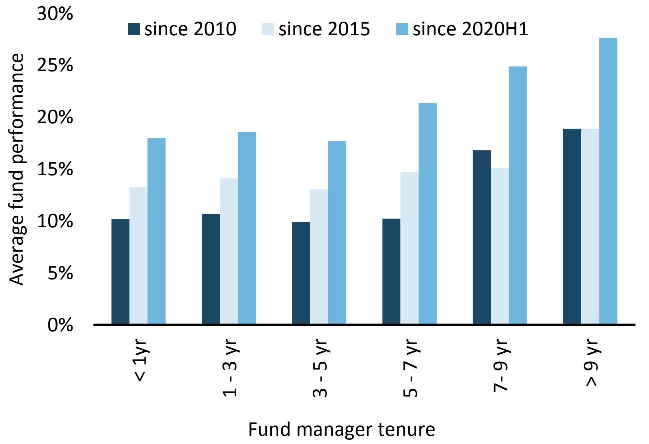
This result may be a reflection of survivorship bias. Presumably managers with a strong track record are more likely to stay in their role than those with a poor one. Nevertheless, Figure 24 suggests that as the industry develops, choosing a long-serving manager in China may be one way to identify potential outperformers.

Figure 23: Average subsequent fund performance sorted by fund manager tenure: in the early years (2005-10), newly-assigned fund managers were more likely to thrive in the subsequent quarter



Note: Subsequent fund performance is annualised equal-weight returns calculated from the changes in funds net value per unit (after-fees), during the subsequent quarter, average over time.
Source: Wind, UBS Quant Research

Figure 24: Average subsequent fund performance sorted by fund manager tenure: as the industry evolves (over the recent decade), long-serving and long-surviving managers are more likely to perform better



Note: Subsequent fund performance is annualised equal-weight returns calculated from the changes in funds net value per unit (after-fees), during the subsequent quarter, average over time.
Source: Wind, UBS Quant Research

A potential fund selection model

Long tracking record + recent outperformance

Combining measures based on both fund performance and characteristics, we create a composite score using the equal-weight average of the rankings based on previous one-year alpha and the rankings based on fund manager tenure. Our back-test shows that smart money is funds that:

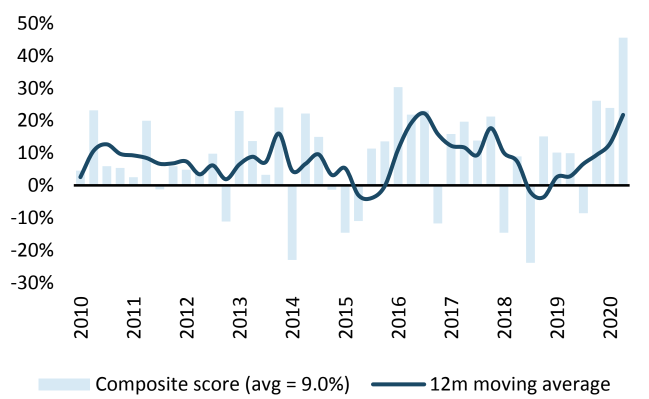
1) Recently performed better (prior one-year alpha), and are
2) Run by a relatively long-serving fund manager (tenure)

Ranked by the above composite score, a top-20 fund basket would have delivered an annualised return of 12.6% after fees since 2010 (Figure 25), outperforming the CSI300 Index by 6.3% per annum (Figure 27). The top half basket (High) would have outperformed the bottom basket (Low) by around 3% per annum since 2010 (Figure 25).

Figure 25: Back-testing performance (after-fees)

Note: Fund performance is annualised equal-weight return calculated from the change in funds net value per unit (after-fees), quarterly rebalanced.
Source: Wind, UBS Quant Research

Figure 26: IC of composite score (since 2010)



Note: Information ratio is rank correlation between composite scores and the subsequent fund returns (after-fees).
Source: Wind, UBS Quant Research

Moreover, future fund performance is mostly monotonic across baskets sorted by composite scores. The score has an information coefficient (IC) of 9% on average since 2010 (Figure 26).

Therefore, despite the caveats, most notably that of survivorship bias, our back-test implies that to invest with an experienced fund manager who has recently performed well might be able to generate superior returns for fund investors.

Figure 27: Back-testing performance statistics

		Absolute fund performance			Excess performance rel. to CSI300 Index		
		Low	High	Top 20	Low	High	Top 20
Since 2005	Annualised Return	16.8%	18.6%	19.0%	1.4%	3.2%	3.6%
	Annualised Volatility	23%	24%	26%	13%	14%	15%
	Risk-adjusted Return	0.73	0.78	0.73	0.11	0.23	0.24
Since 2010	Annualised Return	9.3%	12.0%	12.6%	3.0%	5.7%	6.3%
	Annualised Volatility	19%	20%	24%	13%	14%	16%
	Risk-adjusted Return	0.50	0.59	0.53	0.24	0.41	0.40
Since 2015	Annualised Return	12.6%	15.6%	15.2%	4.4%	7.5%	7.0%
	Annualised Volatility	20%	23%	29%	12%	12%	15%
	Risk-adjusted Return	0.61	0.67	0.53	0.38	0.60	0.48

Note: Performance is calculated using equal-weight fund total returns (after-fees).
Source: Wind, UBS Quant Research

Who is the smart money?

The fund selection model each quarter picks a basket of mutual funds that have a higher chance to outperform in the subsequent quarter. Figure 28 summarises the characteristics of top picks from the fund selection model. At end-H120, it suggested 880 funds as potential outperformers, and their top-10 holdings covered in total 907 stocks.

Figure 28: Who is the smart money picked up by our model?

	Number of Funds	Avg. Fund Age	Avg. Fund Size	Avg. Fund Manager Tenure	#Stocks in Holding	Management Fee		
						Min.	Avg.	Max.
2005	17	2.2	2.4	1.8	70	1.5	1.5	1.5
2006	25	2.6	2.5	2.1	85	1.3	1.5	1.5
2007	43	2.7	15.6	1.8	133	1.2	1.5	1.5
2008	60	3.0	6.3	2.0	158	1.2	1.5	1.5
2009	86	3.5	7.5	2.4	235	1.2	1.5	1.5
2010	110	3.8	5.4	2.7	374	0.7	1.5	1.5
2011	130	4.6	3.9	3.0	390	0.7	1.5	1.5
2012	155	4.8	3.1	3.3	372	0.7	1.5	1.5
2013	179	5.0	2.4	3.2	478	0.8	1.5	1.5
2014	210	5.1	1.9	3.2	657	0.6	1.5	1.5
2015	272	5.5	1.8	2.5	961	0.7	1.5	1.5
2016	419	4.7	1.6	2.4	1,158	0.0	1.4	2.5
2017	681	4.5	1.4	2.6	825	0.0	1.2	2.5
2018	762	5.0	0.7	3.0	899	0.5	1.2	2.5
2019	847	5.8	1.0	3.5	855	0.5	1.3	2.5
2020H1	880	6.2	1.0	3.7	907	0.5	1.4	2.5

Note: Fund size is in Rmb1 billion; fund age is in years; stock number sums up all A-share stocks in selected funds' top-10 holdings.
Source: Wind, UBS Quant Research

Based on the subset of selected mutual funds, in later sections, we study the smart money insights and aim to essentially integrate their insights into our timing and stock selection models.

Timing

In this section we aim to evaluate the timing skills of China mutual fund managers based on the subset of potential outperformers that we picked in the previous section. We monitor the fund positions in different sectors and styles, and translate their positions into the long-short trading signals for timing models.

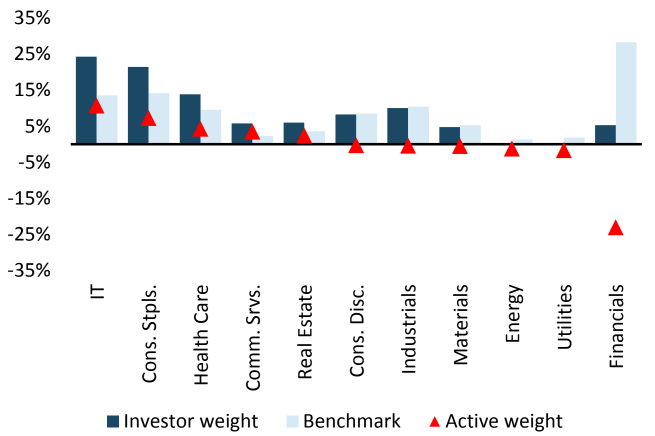
From the model performance, we assess if the sectors and styles favoured by fund managers could perform well in the subsequent time period, i.e. if the fund managers have sector or style timing skills.

Mutual fund positions

In Figure 29 and Figure 30, we aggregate their top fund-stock holdings by sectors and styles, named as "investor weight", compare it with the corresponding benchmark weights in the CSI300 Index, and calculate the relative active weights.

Figure 29 and Figure 30 display the latest sector and style weights of the selected fund managers in aggregate. As of H120, China's onshore mutual funds were most overweight in sectors such as information technology, consumer staples and health care and most underweight financials. In terms of styles, mutual fund managers most favour High Momentum and High ROIC.

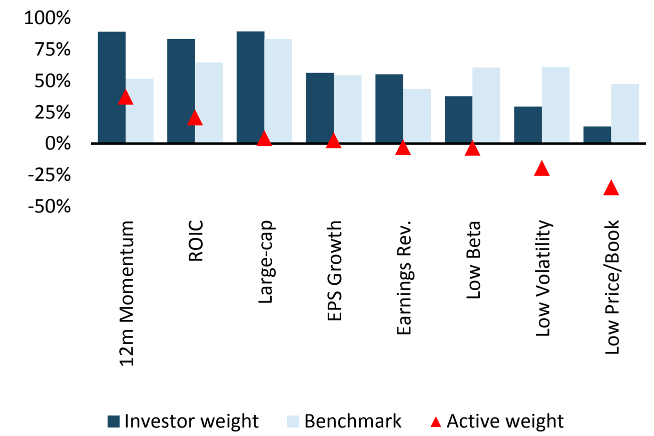
Figure 29: Latest sector preferences



Note: This chart shows mutual funds' active weights in different sector, data as of latest. Active weight is fund holdings relative to CSI300 index benchmark weight. Sector classification is GICS Level I.

Source: Wind, UBS Quant Research

Figure 30: Latest style preferences

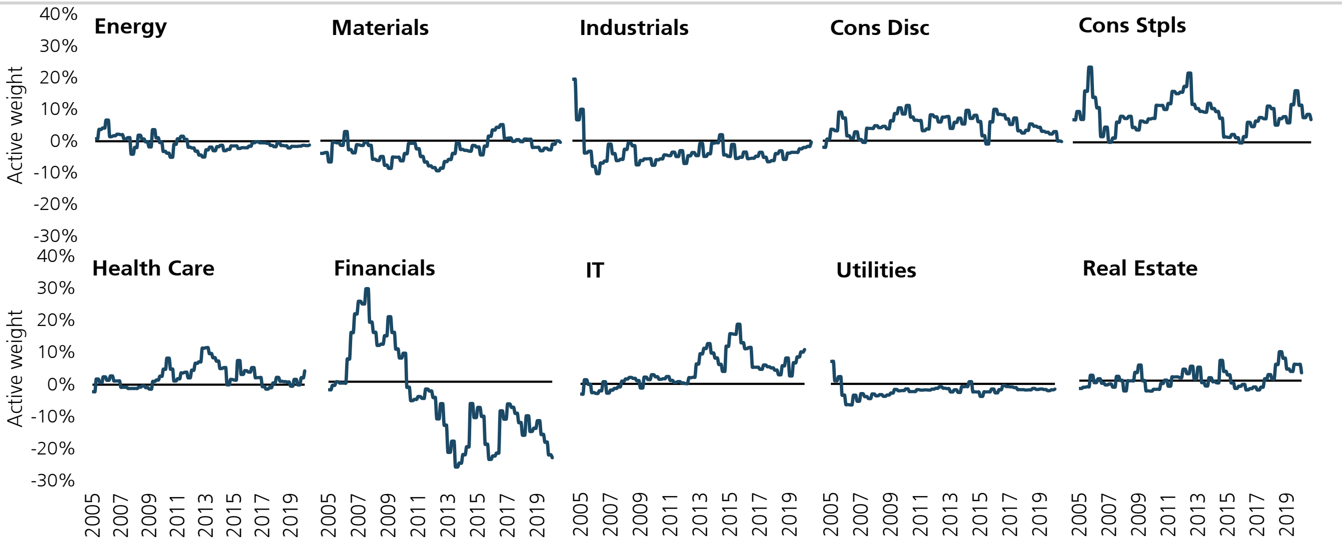


Note: This chart shows mutual funds' active weights in different style baskets, data as of latest. Active weight is fund holdings relative to CSI300 index benchmark weight. Refer to Appendix for style definition.

Source: Wind, UBS Quant Research

In Figure 31 we report mutual funds' historical preferences in sectors. In general, the preferences have fluctuated through time to various degrees. The greatest changes were seen in sectors such as financials, IT and consumer staples. Back in 2007, onshore fund managers were most crowded in financials, while as of H120, the financials sector became the top underweight, and fund managers favoured IT and consumer staples.

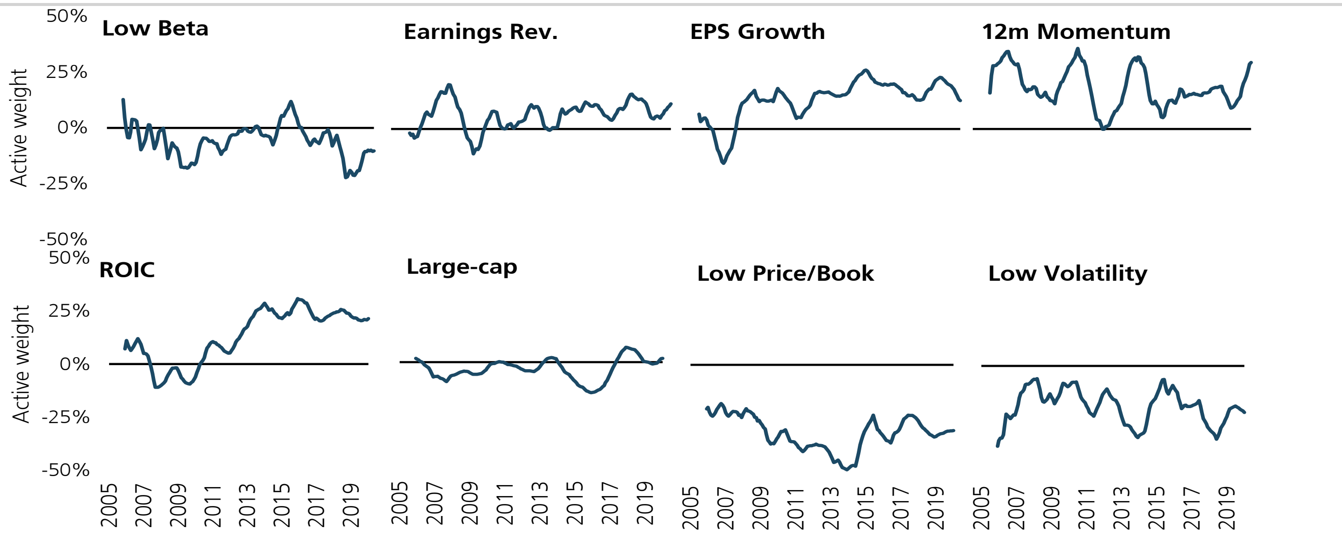
Figure 31: Sector-level active weights in history



Source: Wind, UBS Quant Research

Figure 32 shows the historical preferences in styles. Consistent with previous findings in sector preferences, historical style positions have also been volatile over time. As of most recently, the top underweight style was Low Price/Book, as reflected by the underweight in financials sector, while top overweight include High ROIC and High Momentum stocks most likely populated with IT and consumer staples stocks.

Figure 32: Style-level active weights in history



Source: Wind, UBS Quant Research

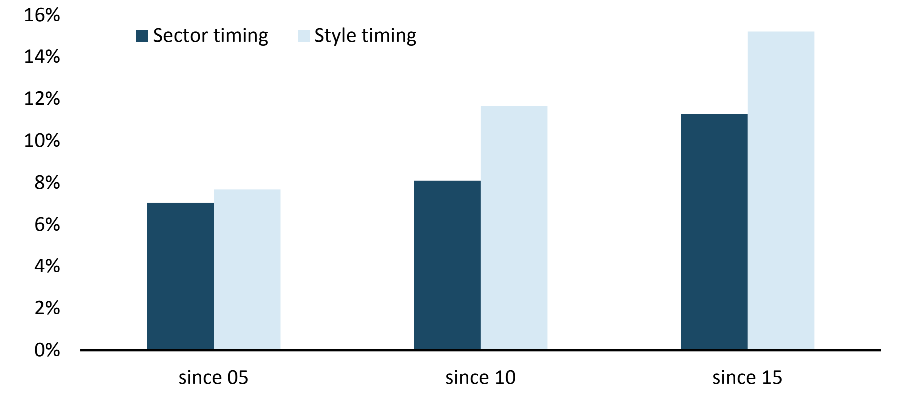
Timing based on fund positions

In this section, we evaluate the timing skills of fund managers. Based on the fund preferences, one direct question is: could the sectors and styles favoured by mutual fund managers perform well in the future?

To answer this question, we translate the investment preferences into long-short trading signals. More precisely, we long the top 1/2 basket of sectors and styles with higher mutual fund holdings and short the bottom half.

In Figure 33, we observe significant rank correlations between sector (style) fund positions and subsequent sector (style) returns. It indicates monotonic future performance in sectors (styles) across fund preferences.

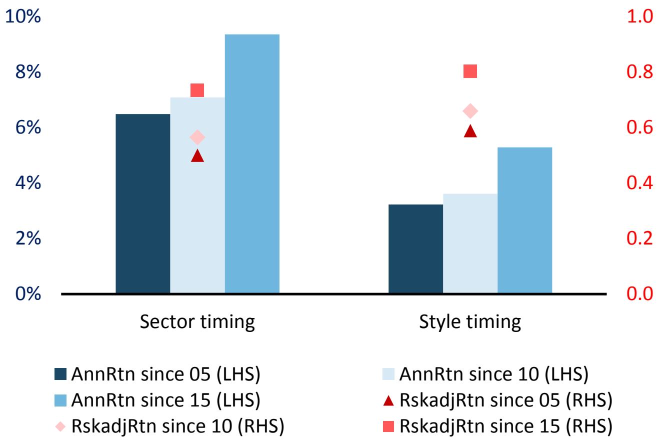
Figure 33: Rank correlation between fund preferences and subsequent sector and style performance



Source: Wind, UBS Quant Research

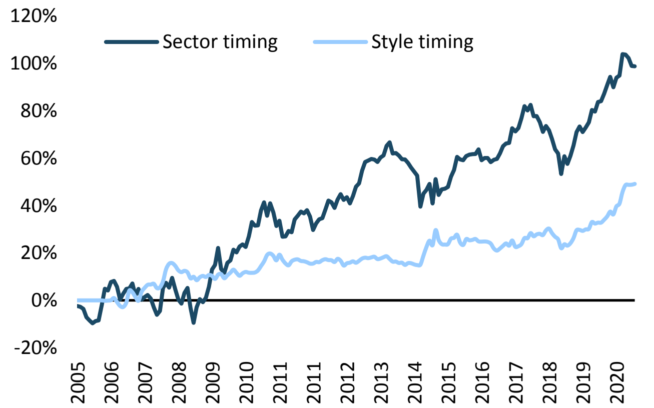
Based on mutual fund preferences, a long-short sector (style) timing strategy would have generated an annualised return of 7.1% (3.6%) since 2010, with a Sharpe ratio at around 0.6 (0.7) as shown in Figure 34. In general, it is reasonable to time the sectors and styles based on mutual fund positions.

Figure 34: Performance statistics of sector and style timing based on fund preferences



Source: Wind, UBS Quant Research

Figure 35: Long-short cumulative performance of sector and style timing



Source: Wind, UBS Quant Research

On the other hand, data shows that in a fifteen-year history, investor preferences have not always accurately forecasted future sector and style performance (Figure 35). For instance, there was a big drawdown in both sector and style timing in 2018, when the whole mutual fund industry had a bad year in onshore China and only 10% of fund managers outperformed their benchmarks, as shown in previous sections.

Stock selection

Stock selection based on fund positions

Three measures

To quantify the level of fund positions and their trading directions, we design three measures as below:

1) **% Hold:** The proportion of shares outstanding held by mutual funds.

2) **Chg in % Hold:** Quarter-over-quarter changes in the proportion of shares outstanding held by mutual funds.

3) **Crowding:** The level of mutual fund crowding based on the number of buyers during each quarter, divided by the sum of buyers and sellers.[1]

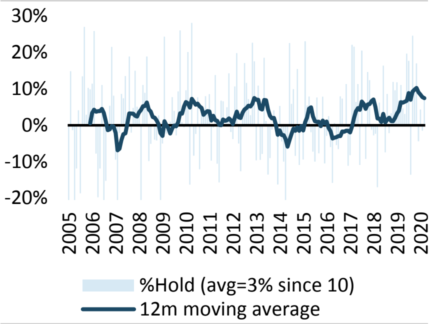
In the following sections we evaluate the stock picking skills of China's domestic asset managers. By identifying their expertise we essentially aim to integrate it into stock selection models.

For each measure, we start with their information coefficients (IC), i.e. the rank correlation between the measures and the subsequent stock returns. It indicates whether stocks favoured by asset managers would thrive in the future.

The portfolio is rebalanced on a quarterly basis using quarterly released holding data. Given the 15-working-day delay, we apply a one-month lag in the quarterly holding data. For example, we use March-end's holding report to calculate the IC with May, June and July's monthly return.

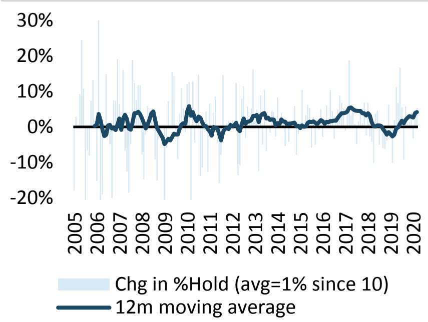
As shown in the following figures, the measure of %Hold has generated the highest IC during the back-testing period (Figure 36), and its IC further improved in recent years. IC of *Chg in %Hold* has been less significant, while the IC of *Crowding* has been mostly negative, especially during the past few years.

Figure 36: IC of %Hold



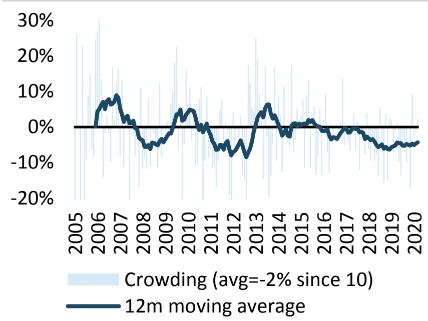
Source: Wind, UBS Quant Research

Figure 37: IC of Chg in %Hold



Source: Wind, UBS Quant Research

Figure 38: IC of Crowding



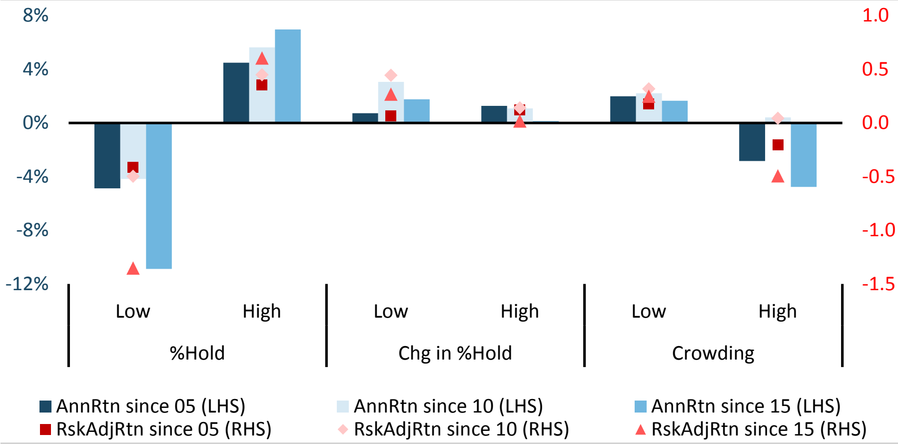
Source: Wind, UBS Quant Research

We then rank the stocks based on the above three measures and look at the future performance of the low versus high baskets. Performance is the excess returns calculated from the cap-weighted average returns in each basket, relative to the corresponding CSI300 Index benchmark returns.

[1] The crowding measure takes into account the number of buyers and sellers, but does not take into account the actual amount bought and sold. Please refer to Appendix in our previous report for a detailed calculation methodology.

Consistent with our findings from IC, *%Hold* has yielded the best performance among three measures (Figure 39). The performance is not monotonic for *Chg in %Hold*. More importantly, we find that stocks with a high level of mutual fund crowding have mostly underperformed.

Figure 39: Excess returns of stock selection based on three measures



Source: Wind, UBS Quant Research

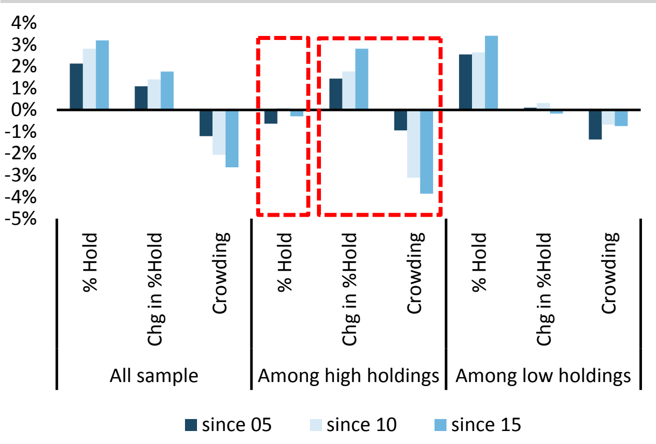
Crowding in fund holdings

To better understand the crowding in mutual fund holdings, we divide the whole universe into two groups, by the above three measures, and calculate the IC of each measure in each group.

As shown in Figure 40, despite the high IC of *%Hold* in all-sample and low-holding samples, among stocks with high fund holdings, the IC of *Chg in %Hold* has been more significant. It indicates that the quarter-over-quarter changes in holdings have been more informative than the absolute level of holdings. We also observe that among high-holding stocks, *Crowding* has become a more significantly negative signal for future performance.

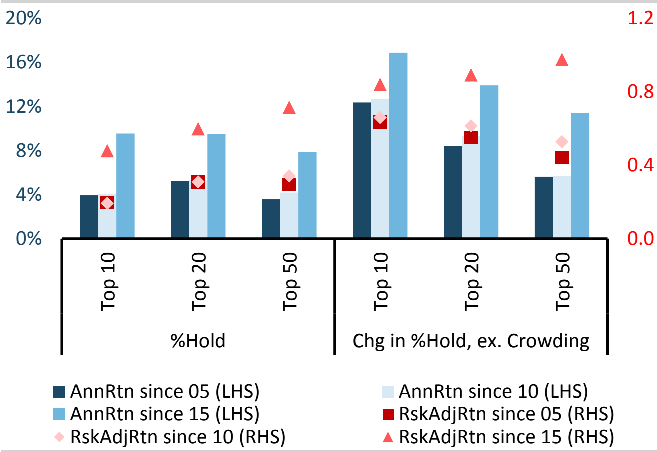
Therefore, in Figure 41, we form the top portfolios by picking stocks with high *Chg in %Hold* and excluding high *Crowding*. We believe this is a better measure to avoid crowding and to identify the stocks in which fund managers display the most conviction. As shown in Figure 41, the top holding portfolios measured in this way yielded higher excess returns compared to those measured by *%Hold*.

Figure 40: IC of three measures in different samples



Source: Wind, UBS Quant Research

Figure 41: Excess returns of high holding portfolios

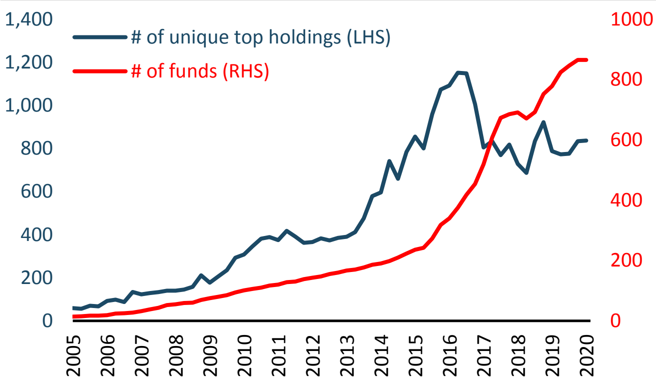


Source: Wind, UBS Quant Research

Figure 42 and Figure 43 further illustrate the increased level of crowding among mutual fund holdings. We observe an obvious increase in concentration among top holdings since 2016 (Figure 42). Figure 43 shows that more and more asset managers are sharing the same ideas even for their top overweight stocks. Although the number of funds kept increasing, the diversity in their top holdings has decreased.

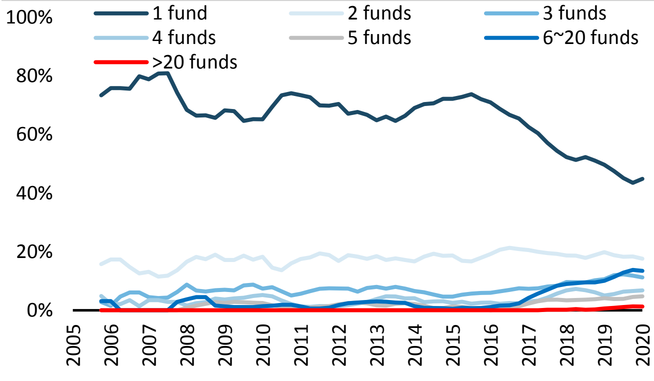
The higher level of crowding among fund holdings can be partially attributed to the overall increased level of industry and market concentration in China's domestic equity market. Since 2016, the large firms with higher margins and market leaders in each industry started to rally due to structurally lower economic growth (report), government supply-side and deleverage policies (report), AI technologies (report), etc. Moreover, we do not see this trend of disruption ending any time soon. So we would recommend monitoring closely the level of crowding in holding-based stock selection models.

Figure 42: Holding concentration has increased (diversity decreased) since 2016



Note: Among all active equity and hybrid funds, here we look at only the subset of funds that are potential outperformers in the future picked by our model.
Source: Wind, UBS Quant Research

Figure 43: How many funds are sharing the same 'best idea'?

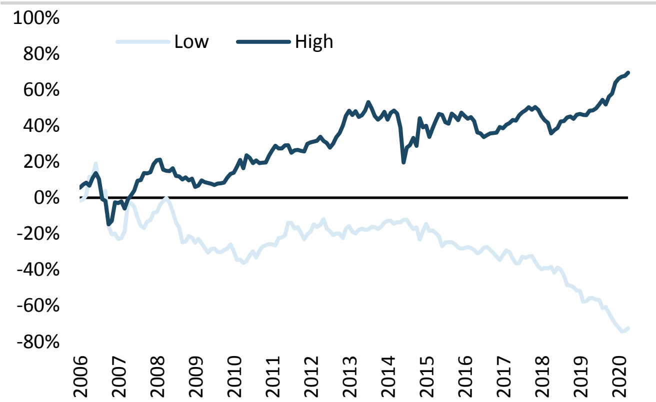


Note: Percentage of N-fund best idea. Best idea stands for the top overweight stock in mutual funds' holdings.
Source: Wind, UBS Quant Research

A long-short strategy

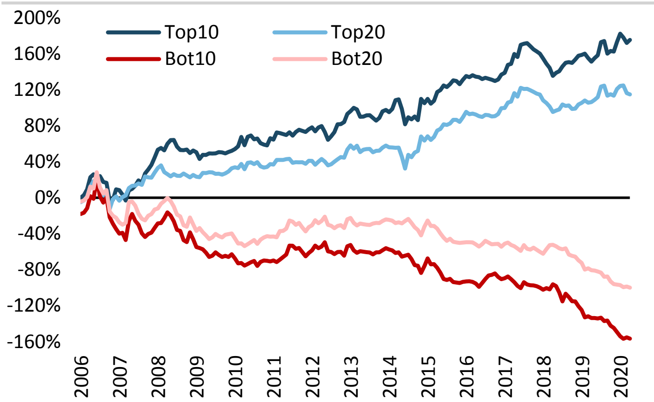
Based on all the previous findings, we summarise in this section the performance of a long-short strategy using mutual funds' stock selection insights.

Figure 44: Performance of long and short strategies



Source: Wind, UBS Quant Research

Figure 45: Performance of top and bottom baskets



Source: Wind, UBS Quant Research

In Figure 44, we show the long basket of stocks with high %Hold and short the low half. The long basket would have yielded an annualised excess return of 5.8%

since 2010, with a Sharpe ratio at 0.47; the short basket would have generated 4.1% at 0.49.

The strategy performance has further improved during recent years, especially on the short side. The short basket would have delivered a negative return of 10.5% per annum since 2015, with a Sharpe ratio of 1.32. This strategy replaces around 20-30% of stocks in both long and short portfolios each quarter (Figure 46).

In Figure 45 we show the performance of top long and top short baskets. We use the measure of high *Chg in % Hold*, excluding *Crowding*. Consistent with previous findings, the short portfolios would have generated more impressive performance since 2015. The performance is more consistent, as reflected by lower volatility at 13.5% (Bottom 10) and 11.1% (Bottom 20) per annum and higher Sharpe ratios at 1.2 and 1.2 since 2015. By contrast, there was a big drawdown of up to 30% in 2018 in the top portfolios.

Due to short-sale constraints, the shorting strategies in the China A-share market used to be underexplored. We would recommend looking at more short ideas in this market, due to a recent regulation on the short-sale business, allowing China's onshore mutual funds to lend out their stock inventory. In this report, our study is focused on the universe of mutual fund stock holdings, and with the new regulation, we should see more eligible stocks and flexibility in stock borrowing and lending (SBL) in the China A-share market. Refer to "Securities lending: a blue ocean opportunity?" for more details.

Figure 46: Statistics of strategy performance

		Long			Short		
		High	Top10	Top20	Low	Bot10	Bot20
Since 05	Annualised Return	4.6%	11.7%	7.6%	-4.8%	-10.4%	-6.7%
	Annualised Volatility	12.5%	19.5%	15.4%	11.8%	18.3%	17.0%
	Risk-adjusted Return	0.37	0.60	0.50	-0.41	-0.57	-0.39
	Max drawdown	-33%	-36%	-31%	-24%	-39%	-33%
	Qtrly One-way Turnover	24%	89%	85%	32%	35%	62%
Since 10	Annualised Return	5.8%	11.7%	8.2%	-4.1%	-8.9%	-5.6%
	Annualised Volatility	12.4%	19.2%	15.3%	8.3%	13.2%	11.8%
	Risk-adjusted Return	0.47	0.61	0.54	-0.49	-0.68	-0.47
	Max drawdown	-33%	-36%	-27%	-24%	-26%	-33%
	Qtrly One-way Turnover	22%	87%	85%	30%	36%	65%
Since 15	Annualised Return	**7.2%**	**14.9%**	**11.6%**	**-10.5%**	**-16.2%**	**-13.3%**
	Annualised Volatility	11.3%	20.1%	15.8%	8.0%	13.5%	11.1%
	Risk-adjusted Return	**0.64**	**0.74**	**0.74**	**-1.32**	**-1.20**	**-1.20**
	Max drawdown	-24%	-36%	-27%	-22%	-16%	-28%
	Qtrly One-way Turnover	21%	82%	80%	26%	38%	69%

Note: Performance is the excess returns calculated from the cap-weighted average returns in each basket, relative to the corresponding CSI300 Index benchmark returns.
Source: Wind, UBS Quant Research

In Figure 59 in Appendix, we also run a risk analysis for the above portfolios from the stock selection model. We use our in-house risk models and decompose the percentage of contribution to total variance, i.e. risk breakdown. It indicates the level of stock-specific drivers in each portfolio, as well as style level exposures.

Where does the expertise lie?

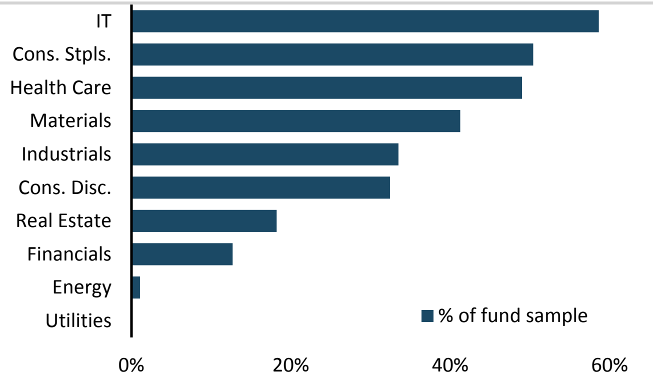
As mentioned in the previous sections, we have identified a subset of potential outperformers, among all active funds, and integrated their stock insights into our stock selection models. In the following section, we investigate the performance of the models, by sector and by style.

By sector

In Figure 47, we compare the percentage of funds that are overweight in each sector. Consistent with Figure 29, up to 60% of funds in our sample have been overweight in the IT sector. In Figure 48, by comparison, we use our in-house risk analysis tool, Portfolio Analysis System[2] to run a risk attribution and to gauge the level of idiosyncratic risk, i.e. stock-level opportunities, in each sector.

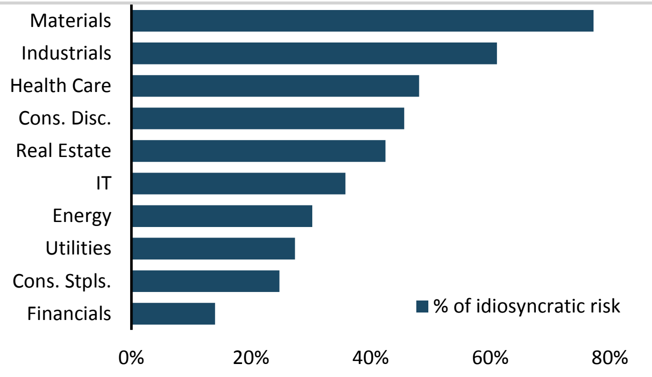
Our updated risk analysis tool is coming soon in Q420—available through API and Excel Add-in

Figure 47: Percentage of funds that are overweight in each sector



Source: Wind, UBS Quant Research

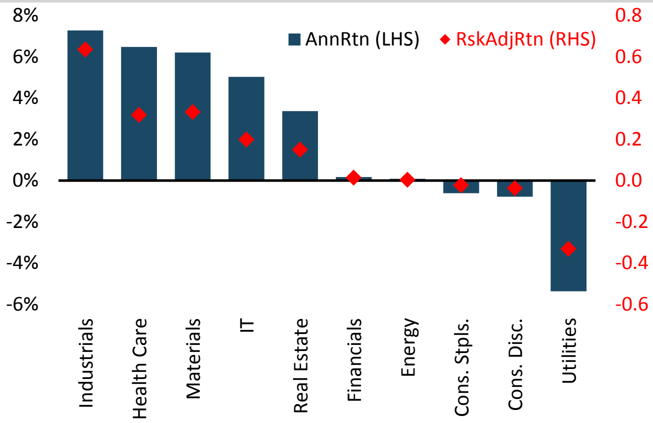
Figure 48: Percentage of idiosyncratic risk contribution to total variance in each sector



Source: Wind, UBS Quant Research

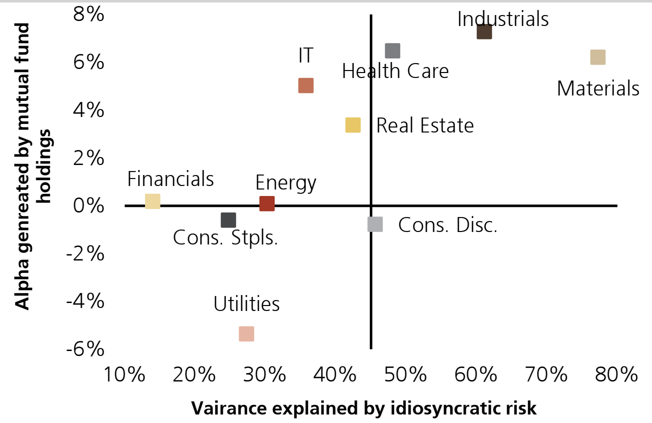
It is interesting to see that although mutual fund managers have been overweight in the IT sector (Figure 47), there has not been enough room for stock pickers to outperform (Figure 48). Therefore the stock selection model based on mutual fund insights has not performed so well in the IT sector (Figure 49).

Figure 49: Relative performance of high versus low fund holdings in each sector



Source: Wind, UBS Quant Research

Figure 50: Relative returns in each sector v.s. sector-level idiosyncratic risk



Source: Wind, UBS Quant Research

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

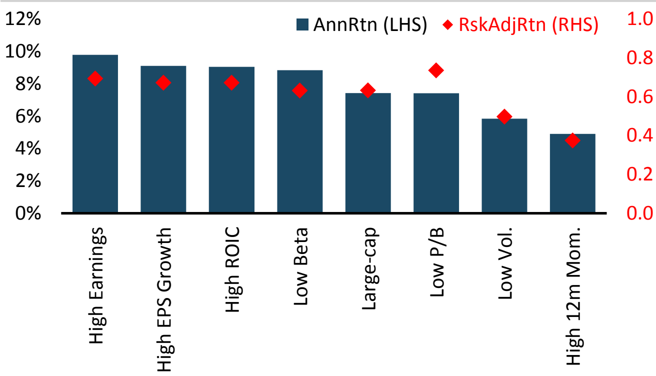
On the other hand, we notice that China's active fund managers generally have more expertise in sectors such as industrial, health care, and materials, where there are more stock-level opportunities (Figure 50).

By factor

Lastly, we attempt to capture forward-looking fundamental insights from active managers and to incorporate them into generic factor definitions. We overlay the active fund managers' holdings onto quant factors and manage to create a set of smarter factors.

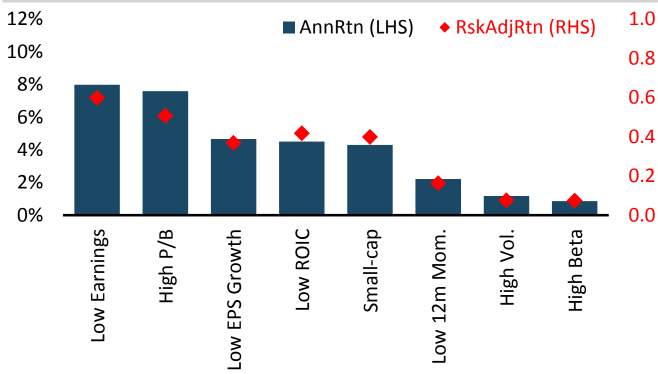
We double sort the universe by factors and by fund holdings. Figure 51 and Figure 52 display the annualised excess returns of stocks with high versus low fund holdings in the intuitively favourable or unfavourable baskets sorted by factors. The results show that fund ownership exhibits additional information across most of the factor baskets. By comparison, mutual fund managers might have more information advantage to tell apart the winners from losers within the baskets of High Earnings, High Growth, and High ROIC stocks.

Figure 51: Relative performance of stocks with high v.s. low fund holdings in intuitively favourable factor baskets



Source: Wind, UBS Quant Research

Figure 52: Relative performance of stocks with high v.s. low fund holdings in undesirable factor baskets



Source: Wind, UBS Quant Research

Conclusion

In summary, we provide a comprehensive study on how to evaluate the investment skills of active mutual fund managers in China. Based on the evaluation, we find that around 20% top-ranked fund managers have generated positive alpha during the past two decades.

Moreover, among all the active asset managers in China, we show that funds that have recently outperformed and that are managed by more experienced managers are likely to outperform in the subsequent period of time.

After we identify potential skilful fund managers, we further translate their forward-looking idiosyncratic insights into a quantified trading signal for sector timing, style timing and stock selection models. Within our back-testing period, the signal has been more informative within sectors of industrials, health care and materials, where there are more stock opportunities. Lastly, the signal is used to enhance the performance of traditional quant factors.

Appendix

Definitions of mutual fund types

Figure 53: Fund classifications

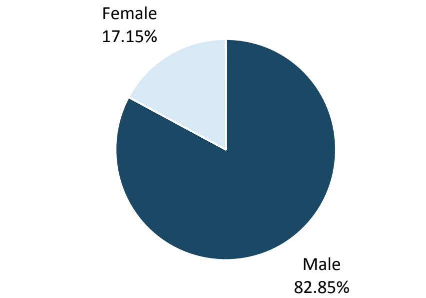
Types	Definitions and Investment Requirements
Equity Fund	Equity exposure ≥ 80%
Normal Equity Fund	Invest more than 80% in equities; fund name must contain the terminology of "equity"; actively-managed
Passive Equity Index Fund	Tracking an equity index; passively-managed
Enhanced Equity Index Fund	Tracking an equity index; implement optimisation or enhancement strategies; passively-managed
Bond Fund	Bond exposure ≥ 80%
Pure Bond Fund	Invest more than 80% in bonds; no investment in equity assets
Hybrid Bond Fund	Invest more than 80% in bonds; some investment in equity assets
Index Bond Fund	Tracking a bond index; implement optimisation or enhancement strategies; passively-managed
Hybrid Fund	20% < equity exposure < 80%; 20% < bond exposure < 80%; flexible allocation in equities and bonds
Aggressive Allocation Fund	More investment in equities than bonds; equity exposure usually more than 60%
Balanced Fund	Balanced allocation in equities and bonds; 30% < equity or bond exposure < 70%
Flexible Allocation Fund	Flexibly allocation in stock and bonds
Moderate Allocation Fund	More investment in bonds than equities; equity exposure usually less than 40%
Money Market Fund	Invest in money markets only
QDII	Invest in equities, bonds, commodities, or other assets in foreign markets other than China's domestic markets
Alternative Investment Fund	Invest in alternative assets; does not fall into the above conventional categories

Source: China Securities Regulatory Commission (CSRC), Asset Management Association of China (AMAC), UBS Quant Research

Fund characteristics

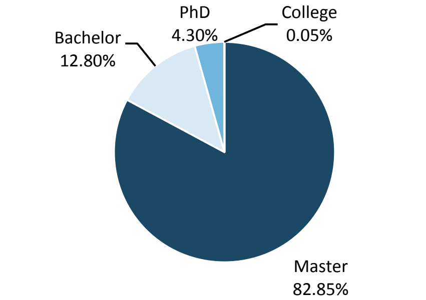
Figure 54 to Figure 56 present more fund manager characteristics extracted from their biographies.

Figure 54: Fund manager gender



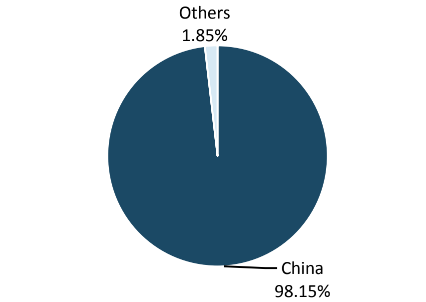
Source: Wind, UBS Quant Research

Figure 55: Fund manager education



Source: Wind, UBS Quant Research

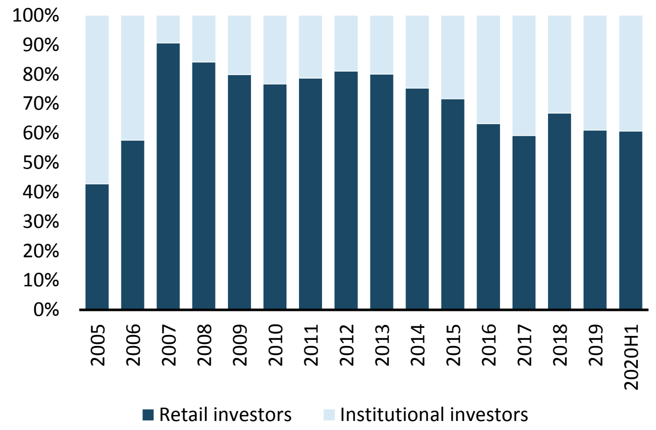
Figure 56: Fund manager nationality



Source: Wind, UBS Quant Research

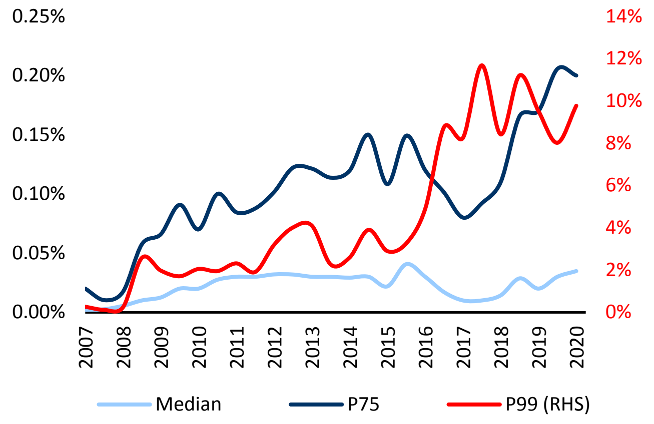
In Figure 57, we see that among all the fund investors in China, retail investors make up around 60%. Their holding peaked in 2007, to more than 90%, and has been decreasing since then. Moreover, as shown in Figure 58, the asset manager himself/herself can invest in the fund product that they run. For some of the funds, the holding percentage of the fund manager is up to 10%.

Figure 57: Mutual fund investor structure



Source: Wind, UBS Quant Research

Figure 58: Percentage of fund manager holding



Source: Wind, UBS Quant Research

Risk analysis results

Figure 59: Risk breakdown (% of contribution to total variance) in each baskets from our stock selection models

	Long High	Top10	Top20	Short Low	Bot10	Bot20
Beta	0.2	3.5	0.8	2.8	6.8	6.2
Macro	4.9	0.5	0.4	1.5	3.7	2.2
Quant/Style	77.2	30.8	38.6	78.0	70.9	69.0
Value	13.2	1.6	3.7	27.7	35.3	28.2
Quality	6.5	-0.5	5.8	30.2	11.8	14.2
Earnings Rev.	0.8	0.1	1.4	3.1	2.3	1.2
Momentum	29.6	11.8	15.1	19.3	15.0	23.7
Volatility	26.8	14.3	12.3	-1.0	3.6	0.4
Size	0.3	3.5	0.3	-1.3	2.9	1.3
Idiosyncratic Risk	17.7	65.2	60.2	17.6	18.7	22.6

Source: Wind, UBS Quant Research

Definition of styles and factors

Style portfolios are formed by assigning stocks in a representative universe into three baskets according to respective factors. Style performance is calculated as the difference between outperformers (high basket) and the benchmark. Portfolio returns are based on free-float market capitalisation weighted average of total returns in US dollar.

Figure 60: Factor definitions

Type	Name	Definition
Value	Book 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

Valuation Method and Risk Statement

Our quantitative models rely on reported financial statement information, consensus earnings forecasts and stock prices. Errors in these numbers are sometimes impossible to prevent (as when an item is misstated by a company). Also, the models employ historical data to estimate the efficacy of stock selection strategies and the relationships among strategies, which may change in the future. Additionally, unusual company-specific events could overwhelm the systematic influence of the strategies used to rank and score stocks.

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Buy	FSR is > 6% above the MRA.	50%	31%
Neutral	FSR is between -6% and 6% of the MRA.	38%	29%
Sell	FSR is > 6% below the MRA.	12%	19%
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 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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