

# (CSI500, CSI300, Equity Tilt) Index Enhanced Strategy

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**\*Claim:** In this page, I only give introduction to the performance of my quant strategies. No any exposure to the strategy details. I reserve all the rights to this personal page.

## Quick Introduction

### 1. @About the Development Timeline

In this document, all the three strategies only use the same factors, which are generated from daily price and volume data. (I also have factors generated from fundamental and other alternative data source, but I didn't use here.). I finished the development of these factors around Dec 2021, after that, I never changed it. a) We know that, define the factor pool may have the risk of overfitting, which is can't avoided. Because they perform well in history, then we think they are good factors! (no matter fitting once or rolling forecast) But here, I didn't change the factor pool after Dec 2021, and all the hyper-parameters and feature selection/combination is learned by the neural network itself. b) And at the very beginning, it's designed for CSI500 index enhanced strategy, not for other strategies. I directly put it into the use of CSI300 index enhanced strategy (similarly, it should strictly select stocks from CSI300 Components and compared with CSI300) Thus, I think my factors are generalized, they capture some pure alphas. (Because previously, I have some experience that, some of my factors are only good at betting the industry, some are only good at betting the CSI300 or CSI500, which are very aggressive).

### 2. About the Desk

Because previously, I was the buy-side quant research at mutual fund desk, whose total trading cost is very high. Thus, I was forced to develop some low frequency signals and strategies. The bad thing is missing many alpha from higher frequency trading, the good thing is to lower the gap between backtesting and real trading, and have bigger strategy capacity. And some index enhanced strategies should strictly select stocks from the index components! You may have seen some daily frequency hedge fund products which has 20%-30% annual alpha. Absolutely they are top players, meanwhile, these products select stocks from all stocks, and has very low trading costs.

### 3. Reference

These ideas start in the campus. The loss function are similar, but the models, the way to bring in diversity are totally different, I found much better one. It has been published on the top computer science conference [KDD 2020](#) and the well known financial journal [Quantitative Finance](#). If you want to get more info, you can read its original [arXiv version](#).

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# Section1 @CSI500 Index Enhanced Strategy (Ready, Only Daily Price Volume)

You can get much more details about the development process of these strategies by accessing the link in my CICC Fund experience. At the very begining, all these factors are designed for this product. I didn't change the factor pool after Dec 2021. And the way to select and combine them is purely systematically. What's more, the hyper-parameters are super important for price and volume factors, sometimes people are just fighting based on it. For me, I designed and fixed around 20 basic neural networks' structures according to finance domain knowledge, and then let them keep on learning the hyper-parameters. such as the defination of long and short term, the input window size, use the relationship betweenm open,high, or open close. Using domain knwoledge to design the structures and let neural network to freely learning dynamic part, is my understanding of current artificial intelligence!

Previously, I also have some factors based on quality, value, growth, wind consensus data and money flow data. Because I don't have Wind at this time, these factors can not be easily replicated, I will try to replicate with other data vendor. According to previous experience, my fundamental data is not as good as my price volume signals. Adding them can't greatly increase total return, but they can make my lines more stright (higher sharpe ratio), especially in 2017, the biggest reverse point in China-A, my deep learning backed price volume signals perform the worst, but the basic fundmantal factors can greatly help!

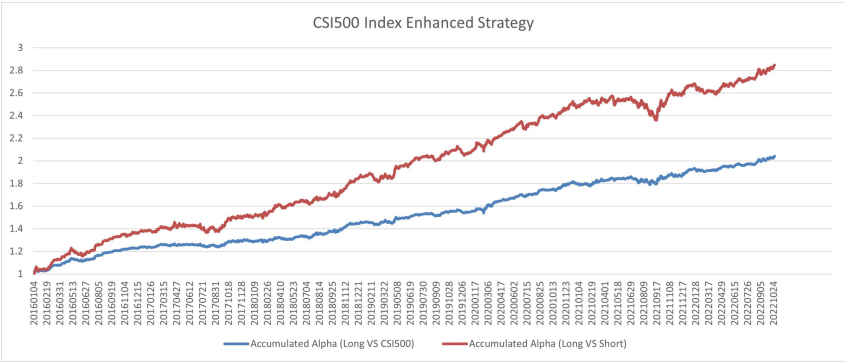


Figure 1.1 Accumulated Return Curve

	A	B	C	D	E	F	G
1		Afterfee Alpha (Long20%-CSI500)	Annual Sharpe (VS CSI500)	Maxdrawdown (Net Alpha)	Daily Turnover rate (Buy&Sell)	Average daily ret	Std daily ret
2	2015	28.78%	6.08	-2.85%	6.06%	22.49 bp	58.52 bp
3	2016	23.98%	4.89	-2.81%	6.99%	9.83 bp	31.76 bp
4	2017	4.92%	0.90	-2.97%	8.22%	2.02 bp	35.3 bp
5	2018	16.57%	2.43	-2.44%	6.28%	6.82 bp	44.32 bp
6	2019	8.62%	1.53	-3.18%	6.63%	3.53 bp	36.58 bp
7	2020	24.75%	3.34	-4.10%	6.51%	10.18 bp	48.2 bp
8	2021	10.46%	1.01	-5.16%	5.94%	4.3 bp	67.3 bp
9	2022	12.78%	2.48	-2.92%	8.10%	6.52 bp	41.63 bp

Figure 1.2 Backtesting Table

The curve shown above is after fee, I put 20bps on both buying and selling. (hedge fund can charge only 20bps on selling). The average daily turnover rate is around 6%-8%. The 2022 can be regarded as totally out of sample, the YTD alpha is around 12.7%. (let me select from the whole market, lower trading cost, using intraday price volume data can make it much more profitable. But maybe higher return, sharpe, also smaller strategy capacity).

## Section2 @CSI300 Index Enhanced Strategy (Half Way, Only Daily Price Volume)

For this strategy, I use the same factors designed for CSI500. You may find that this strategy's alpha volatility is very big. Right, because normally, CSI300 is big cap, and many fundamental based signals are more suitable for this strategy. Thus, in order to make it meet the requirement of a buy-side product strategy, it's better to add in some fundamental factors (they really suitable for CSI300). Or, totally in the opposite direction, reply on sth more high frequency!

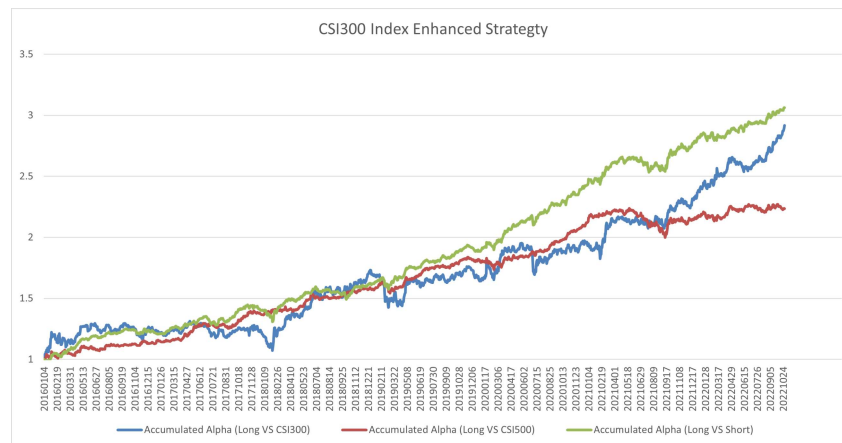


Figure 2.1 Accumulated Return Curve

A	B	C	D	E	F	G
	Afterfee Alpha (Long20%-CSI300)	Annual Sharpe (VS CSI300)	Maxdrawdown (Net Alpha)	Daily Turnover rate (Buy&Sell)	Average daily ret	Std.daily ret
1						
2	2016	24.92%	1.05	-12.90%	5.99%	10.21 bp
3	2017	-2.67%	-0.18	-13.51%	7.14%	-1.09 bp
4	2018	52.54%	2.09	-13.28%	4.99%	21.62 bp
5	2019	-8.94%	-0.37	-30.51%	6.26%	-3.66 bp
6	2020	29.22%	1.01	-25.74%	5.59%	12.02 bp
7	2021	38.81%	1.50	-12.99%	6.34%	15.97 bp
8	2022	55.08%	2.97	-11.98%	8.07%	28.1 bp

Figure 2.2 Backtesting Table

For further research, I need put in some consensus factors, or at least some PB-ROE sub strategy, they are very helpful! When I was still at the buy-side desk, my senior PM has help me to investigate what kind of moeny I earn from CSI300 by using price and volume data. Because the majority players in CSI300 make money by using fundamental factors. We found that whether doing industry balance will make very big difference to this strategy. Thus, we suspect that there are a huge part of profits is earned by timing the industry in CSI300.

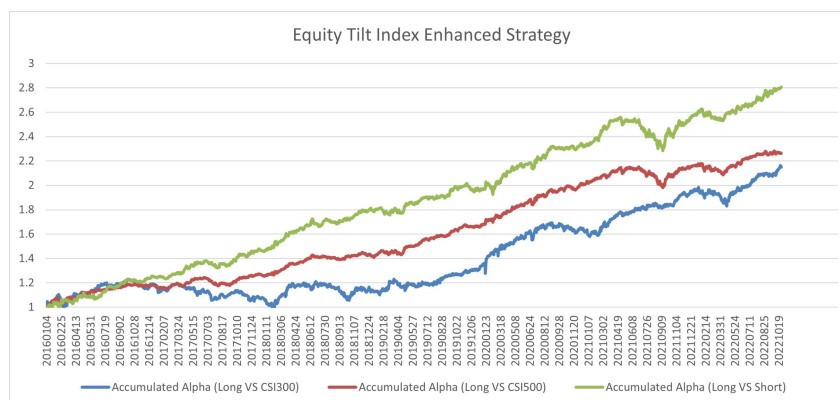
## Section3 @Equity Tilt Index Enhanced Strategy (Half Way, Only Daily Price Volume)

Equity Tilt Index is a very special index in China A. It contains almost all the fundamental-driven mutual fund products. Thus, it can represent the average fundamental-driven mutual fund players' performance. Similar to the famous paper, 'alpha cloning the 13F'. The China mutual fund disclosure also has a time delay. Normally, the quarterly reports disclose the top 10 holding, and has 20 trading days' delay. The yearly reports disclose the full holding, has around 40 trading days' delay. Shown in this paper, and also shown in the real practice in China A, alpha cloning the fundamental PM's average performance, even with a time delay, can have significant positive alpha return.



**Figure 3.1** Compare Equity Tilt Index with Other Index

As shown in Figure 3-1, in recent several years, although we often talk about the mutual fund crowding, but this crowding really has its reason, it's a very strong alpha source! It's really hard to leave it alone. It can easily beat csi300 and csi500 in recent years. 2017 and 2018 is bad for it, it can be explained, because in the 2017 and 2018, most PM play badly, no matter hedge fund or mutual fund. For a strategy follow their average performance, of course, can't outperform the index. And for this index, it gives a lot of basic information about the good stocks! What we need is to regard it as benchmark, and further improve it by selecting stocks!



**Figure 3.2** Accumulated Return Curve

	A	B	C	D	E	F	G
1		Afterfee Alpha (Long20%-CSI500)	Annual Sharpe (VS CSI500)	Maxdrawdown (Net Alpha)	Daily Turnover rate (Buy&Sell)	Average daily ret	Std daily ret
2	2016	14.77%	0.82	-10.48%	7.76%	6.05 bp	116.38 bp
3	2017	-11.33%	-1.02	-14.73%	5.28%	-4.64 bp	72.2 bp
4	2018	0.44%	0.38	-15.33%	6.27%	2.65 bp	109.58 bp
5	2019	18.24%	1.24	-9.30%	6.91%	7.47 bp	95.38 bp
6	2020	31.89%	1.47	-8.51%	7.24%	13.12 bp	140.72 bp
7	2021	32.92%	2.52	-5.52%	5.88%	13.55 bp	85.07 bp
8	2022	19.65%	1.51	-15.39%	6.64%	10.02 bp	105.16 bp

**Figure 3.3 Backtesting Table**

Obviously, it can earn more alpha than the CSI500 index enhanced strategy, and because this index is large than CSI300, long quintile this index can have larger strategy capacity. The bad thing is that, it will also suffer from the mutual fund crowding, which cause relatively higher max-drawdown.

## @Thanks for Your Attention.

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