

# WorldQuant Alpha Presentation

Yilin Zhang, Yiyang Xu

September 10, 2024

# Alpha 1

## Aggregate Data

Sharpe<sup>•</sup>  
3.92

Turnover<sup>•</sup>  
9.21%

Fitness<sup>•</sup>  
4.81

Returns<sup>•</sup>  
18.80%

Drawdown<sup>•</sup>  
6.01%

Margin<sup>•</sup>  
40.82‰



Year	Sharpe	Turnover	Fitness	Returns	Drawdown	Margin	Long Count	Short Count
2016	6.21	9.89%	8.33	22.49%	1.00%	45.49‰	503	944
2017	4.31	8.90%	5.12	17.65%	2.04%	39.66‰	637	1173
2018	5.63	10.55%	7.48	22.09%	1.21%	41.86‰	678	1318
2019	3.00	7.95%	3.15	13.80%	6.01%	34.74‰	642	1325
2020	2.31	9.00%	2.60	15.80%	4.36%	35.13‰	660	1290
2021	9.38	8.14%	19.25	52.64%	0.77%	129.32‰	697	1225

**Assumption:** CHN market is relative inefficiency, high retail participation, and pronounced volatility provide unique opportunities for this alpha strategy. Its statistical approach exploits anomalies, leverages data-driven insights from sentiment-driven trading, and capitalizes on the high market volatility.

# Alpha1 - Idea and Source

**Idea and Source:** Drawing from Fisher Black's concept of Noise and Information Traders, we posit that markets often oscillate between weak and semi-strong states[1]. Leveraging this understanding, we propose a two-pronged approach: employing fundamental analysis to discern long-term positive trends in individual stocks, coupled with technical analysis to identify optimal entry points.

- ▶ Technical Alphas: consider market sentiment and liquidity.
- ▶ Fundamental Alphas: consider company's growth rate and financial robustness.
- ▶ Combine multiple alphas.
- ▶ Apply proper selling condition according to China market regulatory environment.

**Next Step Idea:** Adjust weights of the fundamental and technical factors.

# Alpha 1 - PnL



Figure: Alpha1 Final PnL

# Alpha 2

## Aggregate Data

Sharpe<sup>•</sup>  
2.98

Turnover<sup>•</sup>  
10.48%

Fitness<sup>•</sup>  
3.40

Returns<sup>•</sup>  
16.30%

Drawdown<sup>•</sup>  
6.84%

Margin<sup>•</sup>  
31.11‰



Year	Sharpe	Turnover	Fitness	Returns	Drawdown	Margin	Long Count	Short Count
2016	3.44	11.39%	3.66	14.14%	1.25%	24.83‰	343	314
2017	4.18	8.91%	5.19	19.25%	1.40%	43.21‰	421	359
2018	2.37	9.73%	2.45	13.39%	3.27%	27.51‰	441	336
2019	2.46	10.14%	2.71	15.19%	6.45%	29.97‰	417	353
2020	2.71	12.14%	3.04	15.75%	5.68%	25.95‰	412	354
2021	7.21	13.69%	14.84	57.97%	0.96%	84.72‰	418	369

**Assumption:** CHN market is volatile and price revision usually happens in a short-term trending market. The correlation between volume and high price captures the trend. Capture different resolution level signals to enhance the overall alpha performance.

## Alpha2 - Idea and Source

**Idea and Source:** A paper shows that different resolution-level discretization to a continuous flow will provide different level information[2]. Assuming stocks are modeled by a stochastic differential equation, the discretized signals at different granularities will contain different information.

- ▶ Calculate price-volume correlation on different resolution.
- ▶ Multiply correlations together.
- ▶ Apply fundamental alpha to select stocks.
- ▶ Apply proper selling condition to pass robust test.

**Next Step Idea:** Apply proper normalize and neutralize.

# Alpha2 - PnL



Figure: Alpha2 Final PnL

# Alpha 3

## Aggregate Data

Sharpe<sup>•</sup>  
2.96

Turnover<sup>•</sup>  
15.30%

Fitness<sup>•</sup>  
3.77

Returns<sup>•</sup>  
24.78%

Drawdown<sup>•</sup>  
6.32%

Margin<sup>•</sup>  
32.39‰



Year	Sharpe	Turnover	Fitness	Returns	Drawdown	Margin	Long Count	Short Count
2016	3.86	16.65%	4.15	19.27%	4.59%	23.15‰	897	1042
2017	4.22	15.43%	6.42	35.69%	2.72%	46.26‰	935	1023
2018	1.71	14.59%	1.78	15.81%	5.82%	21.68‰	948	1001
2019	1.58	15.26%	1.41	12.07%	6.32%	15.81‰	900	1043
2020	3.23	14.86%	4.77	32.45%	4.22%	43.66‰	879	1063
2021	14.70	14.69%	40.30	110.43%	0.16%	150.32‰	941	1016

**Assumption:** CHN market is volatile and price revision usually happens in a short-term trending market. The correlation between volume and weighted price captures the trend. The correlation between high/low and volume also captures the liquidity trend.



## Alpha 3 - Idea and Source

**Idea and Source:** Consider the final alpha is a momentum. The sign of the alpha represents the direction. The higher liquidity is, the harder for a trader to influence the trend. Therefore, we can understand the liquidity as mass. The stronger the price trend is, the larger the price will change. Therefore, we can understand the price trend as velocity. As  $p = m \times v$ , we multiply these two factors to get final alpha.

- ▶ Calculate the correlation between volume and weighted price.
- ▶ Calculate the correlation between high/low and volume.
- ▶ Multiply the two values together with proper modification.

**Next Step Idea:** Apply proper stock selection condition and selling condition.

# Alpha 3 - PnL



Figure: Alpha3 Final PnL

# References

- [1] Fischer Black. “Noise”. In: *The journal of finance* 41.3 (1986), pp. 528–543.
- [2] Bin Shi, Simon S Du, Michael I Jordan, et al. “Understanding the acceleration phenomenon via high-resolution differential equations”. In: *Mathematical Programming* (2021), pp. 1–70.