

全频段时间序列模型

汇报人：王麟

时间：2025.07.18



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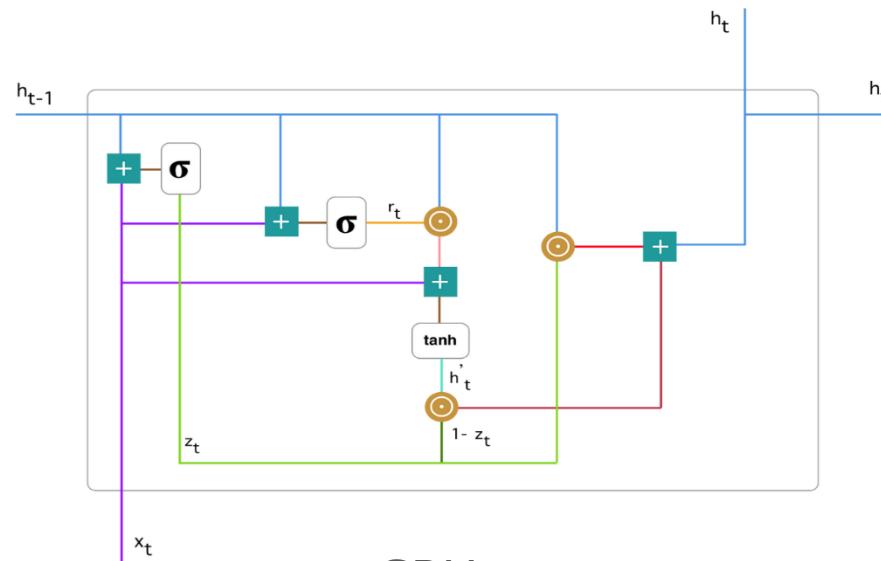
多任务低频量价模型



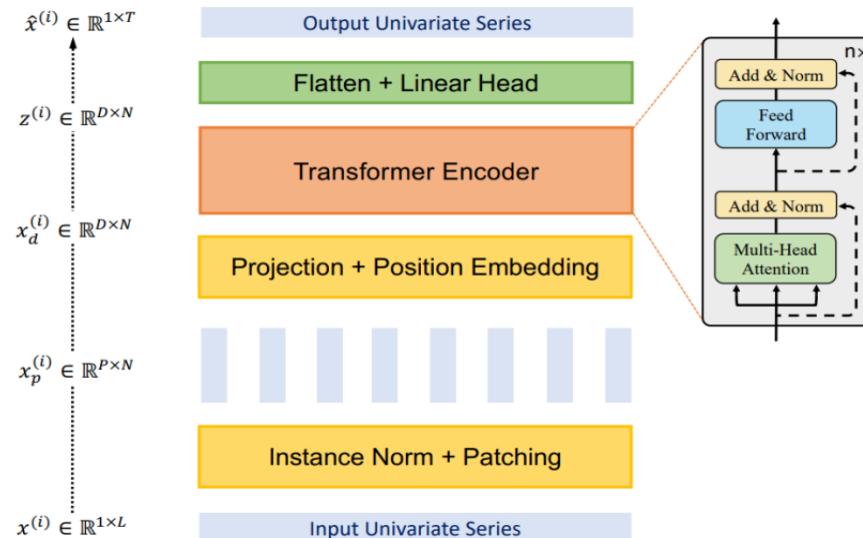
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基础数据模型

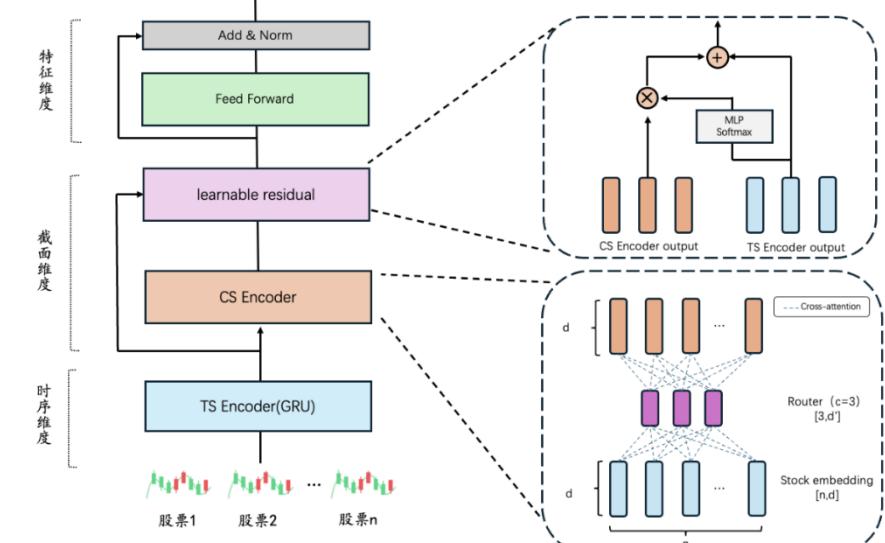




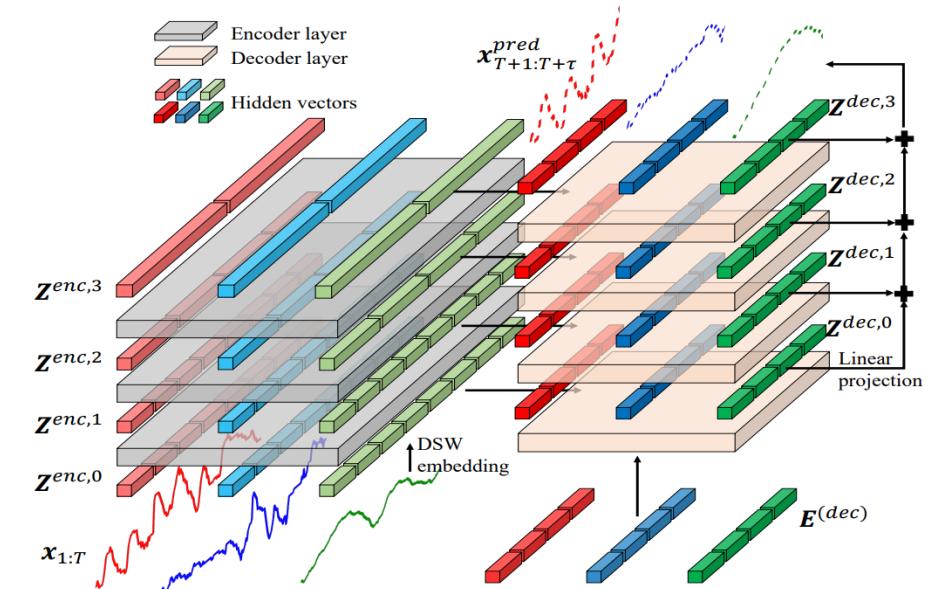
GRU



PatchTST



CrossGRU

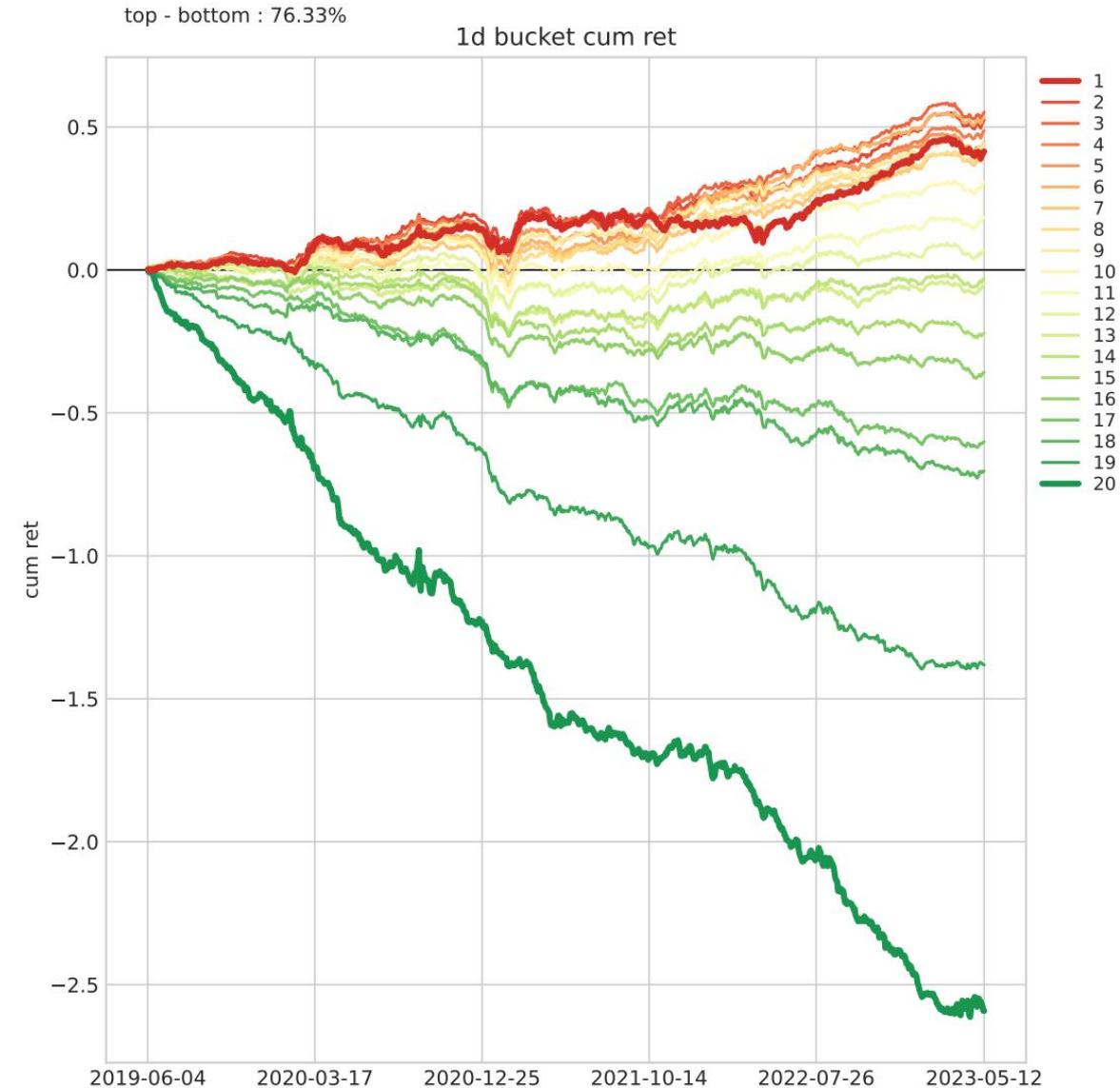


Crossformer

01

基础数据模型—结果回顾

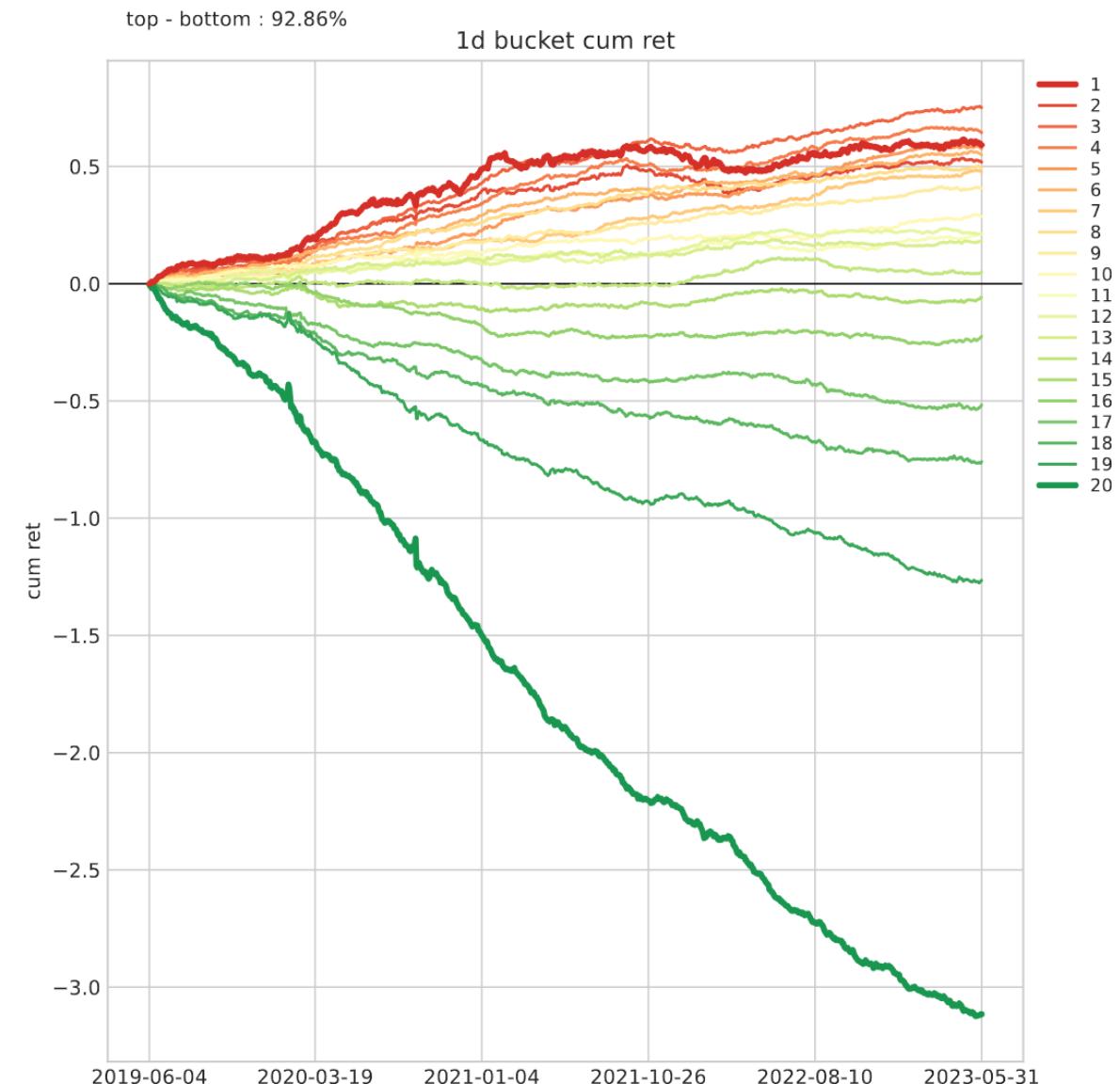
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	10.52	9.03	1.17	11.02	239.88
2	13.32	8.13	1.64	11.14	352.74
3	14.01	8.04	1.74	11.78	384.26
4	12.38	7.87	1.57	13.0	398.99
5	11.31	8.15	1.39	14.94	409.14
6	13.55	8.03	1.69	14.41	415.02
7	10.31	7.97	1.29	15.35	417.97
8	10.66	7.81	1.37	17.06	420.9
9	11.26	7.76	1.45	16.25	422.12
10	7.83	7.75	1.01	20.01	422.22
11	4.66	7.83	0.59	17.35	421.61
12	1.81	7.78	0.23	19.29	420.25
13	-1.24	7.76	-0.16	23.13	418.06
14	-0.73	7.82	-0.09	24.75	415.23
15	-5.6	7.83	-0.71	30.24	410.57
16	-9.08	8.24	-1.1	37.84	403.09
17	-15.26	8.59	-1.78	62.23	391.64
18	-17.86	9.35	-1.91	73.35	371.37
19	-35.08	10.73	-3.27	140.58	323.41
20	-65.81	16.76	-3.93	261.4	171.83
top - bottom	76.33	17.8	4.29	11.67	nan
long - short	31.12	7.73	4.03	4.15	nan



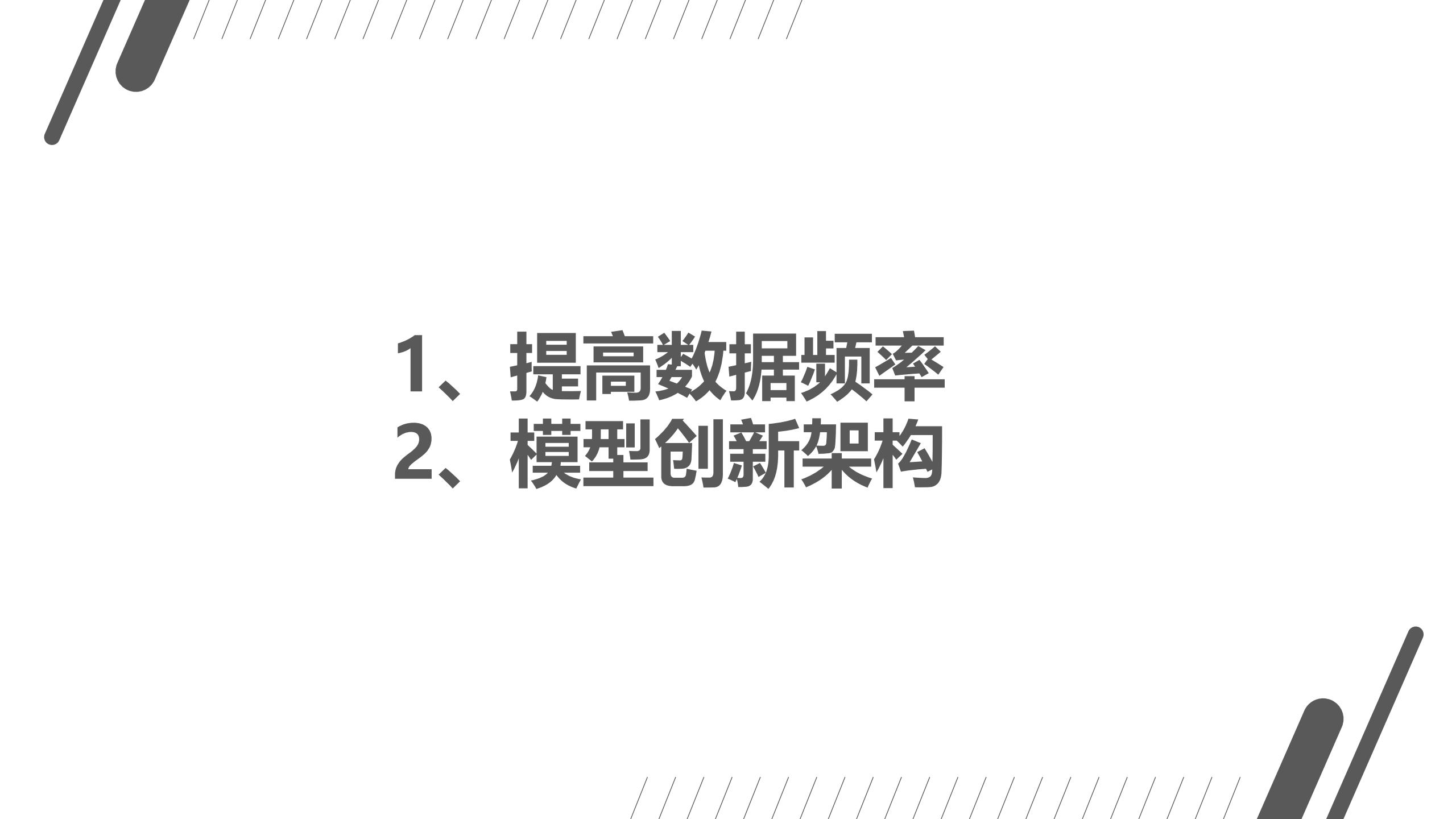
GRU 30min 40日回看 10日预测 MSE 64隐藏层

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	14.81	7.83	1.89	11.43	354.73
2	12.99	5.56	2.34	12.31	417.51
3	18.82	4.64	4.06	5.98	431.65
4	16.14	4.09	3.95	5.72	437.92
5	14.4	3.94	3.65	2.15	440.93
6	13.75	3.52	3.91	3.11	444.1
7	11.93	3.5	3.41	1.81	445.9
8	12.39	3.37	3.67	2.06	447.29
9	10.22	3.22	3.17	1.98	448.65
10	7.17	3.46	2.07	2.86	448.29
11	5.34	3.42	1.56	4.66	446.57
12	5.38	3.23	1.67	3.62	446.76
13	4.52	3.37	1.34	2.85	445.86
14	1.24	3.59	0.34	7.04	443.08
15	-1.49	3.97	-0.37	12.3	440.49
16	-5.61	4.18	-1.34	26.92	437.24
17	-12.96	4.9	-2.65	53.76	433.18
18	-19.02	5.77	-3.29	76.76	425.32
19	-31.69	7.32	-4.33	127.67	407.88
20	-78.05	10.79	-7.23	312.07	367.2
top - bottom	92.86	16.06	5.78	10.13	nan
long - short	34.71	7.68	4.52	5.82	nan



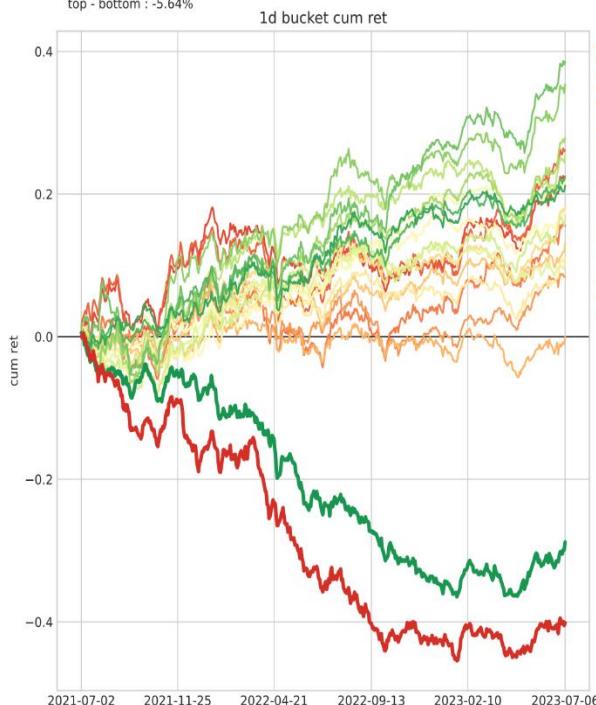
CrossGRU 30min 40日回看 10日预测 MSE 64隐藏层

- 
- 1、提高数据频率
 - 2、模型创新架构

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	-19.99	10.22	-1.96	45.9	414.13
2	11.18	10.03	1.12	11.79	403.95
3	13.0	10.78	1.21	13.26	398.48
4	7.75	10.07	0.77	13.07	398.73
5	4.19	8.41	0.5	11.07	377.57
6	0.02	7.72	0.0	8.79	378.91
7	6.51	7.6	0.86	7.16	378.18
8	9.03	7.9	1.14	5.32	373.34
9	5.52	7.45	0.74	9.18	371.66
10	8.77	6.84	1.28	5.56	374.29
11	11.03	7.53	1.47	5.48	371.11
12	5.27	7.3	0.72	5.7	371.0
13	8.18	8.1	1.01	8.79	365.9
14	12.66	8.31	1.52	9.12	370.2
15	13.9	8.95	1.55	7.87	372.03
16	17.62	10.49	1.68	8.38	382.4
17	19.19	10.71	1.79	12.99	372.85
18	11.17	7.95	1.4	6.12	382.96
19	10.54	8.04	1.31	6.76	381.93
20	-14.34	8.98	-1.6	37.01	410.15
top - bottom	-5.64	8.42	-0.67	14.57	nan
long - short	-16.88	9.69	-1.74	42.69	nan

1d bucket cum ret

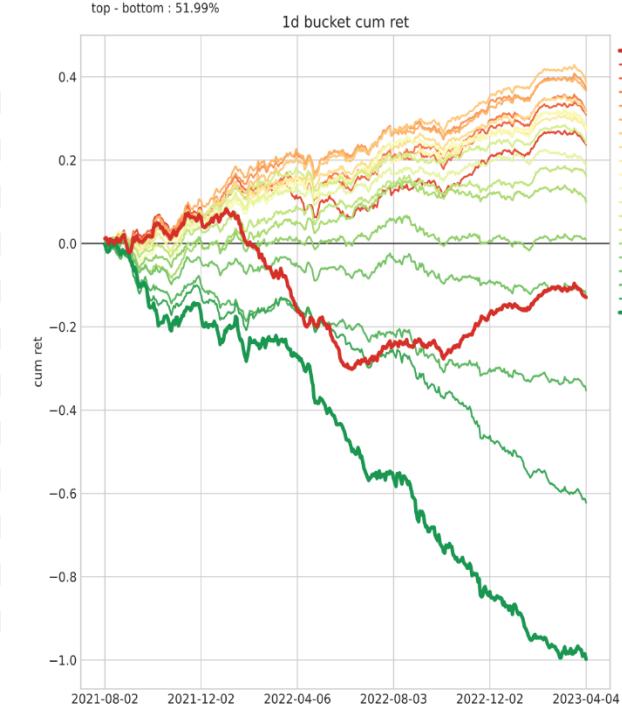


CrossGRU

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	-7.75	10.18	-0.76	38.44	459.83
2	14.17	9.04	1.57	8.57	454.92
3	18.52	8.76	2.11	6.18	454.42
4	18.96	8.33	2.28	6.65	455.04
5	22.16	8.64	2.56	5.46	455.04
6	21.97	8.44	2.6	6.18	455.47
7	23.21	8.48	2.74	5.17	457.29
8	18.72	8.07	2.32	4.26	457.5
9	16.13	8.31	1.94	5.46	457.72
10	16.68	8.12	2.05	4.66	459.16
11	16.3	8.17	1.99	5.22	458.79
12	11.06	7.83	1.41	4.39	459.74
13	14.33	7.89	1.82	5.68	459.24
14	9.67	7.89	1.23	5.72	458.21
15	5.93	8.35	0.71	9.79	457.93
16	0.53	8.11	0.07	8.39	455.26
17	-7.53	8.46	-0.89	13.51	452.87
18	-21.11	9.3	-2.27	35.67	448.32
19	37.25	10.35	-3.6	62.67	440.52
20	-59.74	14.51	-4.12	100.37	410.51
top - bottom	51.99	16.1	3.23	20.97	nan
long - short	38.29	10.26	3.73	8.07	nan

1d bucket cum ret



PatchTST

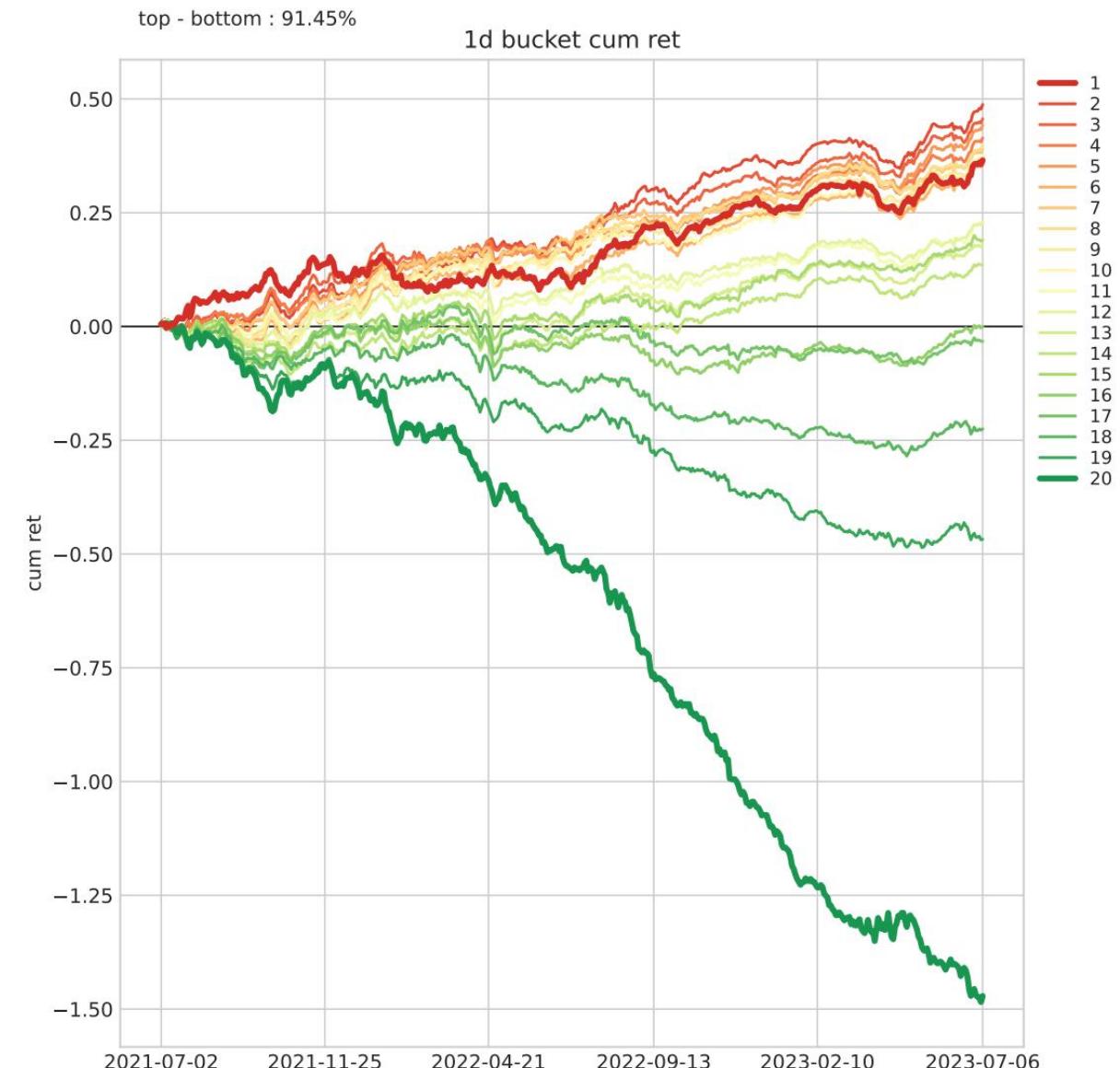
5m数据 10: 00回测，不使用第二天数据

01

基础数据模型—加入回测时间前数据

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	18.2	10.2	1.78	8.07	284.27
2	24.29	9.18	2.65	6.67	373.02
3	22.73	8.94	2.54	5.34	398.37
4	20.64	8.85	2.33	6.24	407.8
5	22.03	8.59	2.56	6.28	415.68
6	18.01	8.43	2.14	6.1	419.99
7	19.45	8.2	2.37	5.88	421.33
8	19.88	8.26	2.41	6.78	422.17
9	18.65	8.09	2.31	5.38	423.28
10	18.76	8.38	2.24	6.87	421.91
11	11.48	8.36	1.37	7.42	422.49
12	11.39	8.17	1.39	5.72	419.06
13	9.01	8.1	1.11	8.64	414.84
14	6.76	8.47	0.8	10.63	409.04
15	9.48	8.61	1.1	8.62	402.24
16	0.01	8.76	0.0	12.39	392.71
17	-1.62	8.84	-0.18	12.84	380.42
18	-11.2	9.59	-1.17	29.5	357.56
19	-23.27	10.6	-2.2	49.44	311.18
20	-73.25	15.44	-4.75	149.24	189.94
top - bottom	91.45	18.01	5.08	11.57	nan
long - short	55.58	11.85	4.69	7.22	nan

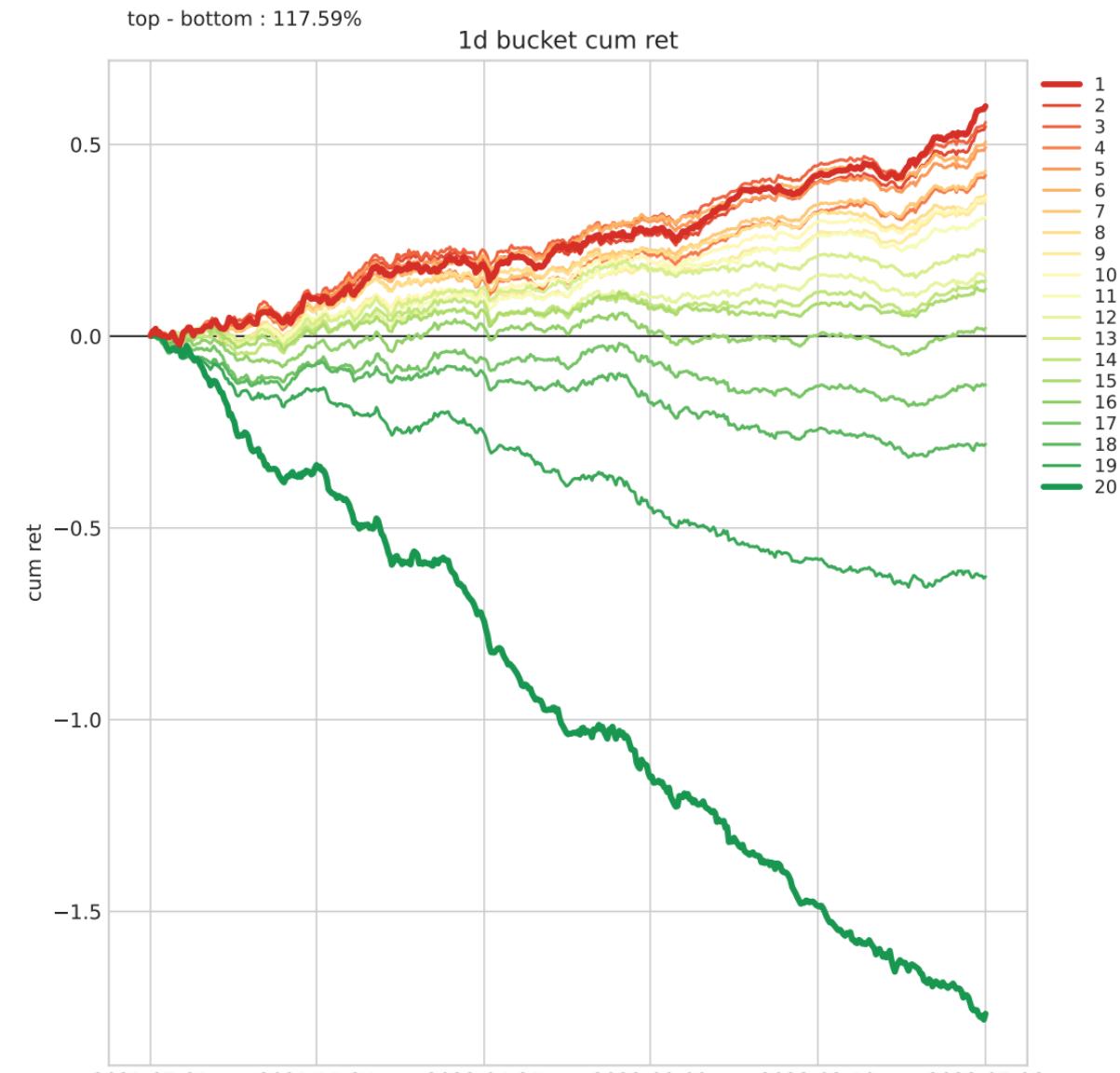


01

基础数据模型—1m

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	29.8	9.66	3.09	6.18	450.91
2	27.17	9.18	2.96	6.09	451.52
3	27.71	8.82	3.14	4.95	453.82
4	20.85	8.66	2.41	8.14	453.69
5	24.44	8.51	2.87	4.24	455.75
6	25.19	8.37	3.01	4.45	456.41
7	21.42	8.01	2.67	4.7	457.8
8	18.38	7.86	2.34	4.69	458.73
9	17.5	7.53	2.32	4.13	459.06
10	18.03	7.8	2.31	3.87	460.02
11	15.39	7.64	2.01	5.21	459.67
12	8.16	7.66	1.07	5.89	460.16
13	11.29	7.64	1.48	6.37	459.87
14	7.17	7.57	0.95	5.88	459.58
15	6.16	7.76	0.79	6.58	458.19
16	1.05	7.79	0.13	11.15	456.39
17	-6.28	8.47	-0.74	18.35	452.73
18	-14.0	8.6	-1.63	31.75	447.48
19	-31.16	9.81	-3.18	65.42	437.52
20	-87.79	13.66	-6.43	179.1	400.97
top - bottom	117.59	14.46	8.13	3.41	nan
long - short	63.03	9.48	6.65	2.99	nan

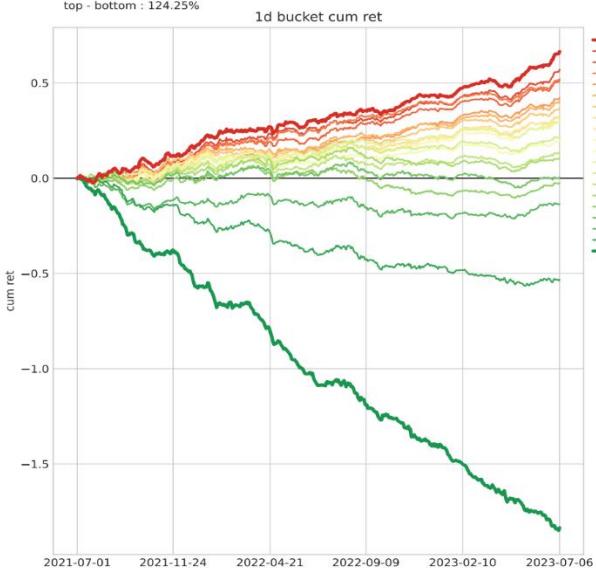


PatchTST 1m pred1 window1 MSE

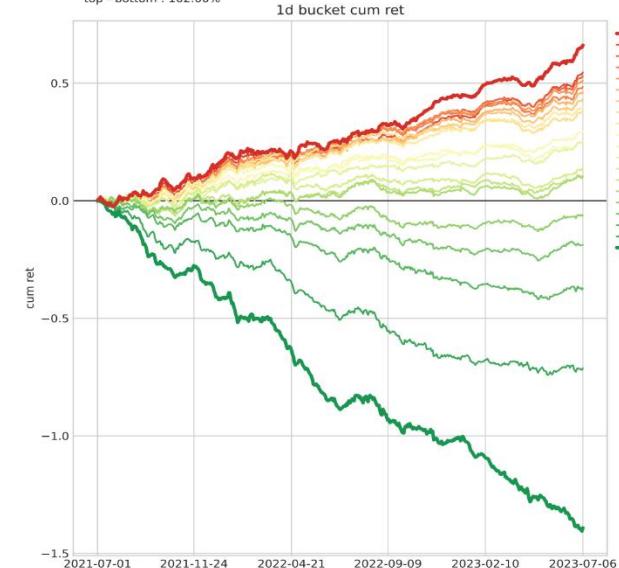
01

基础数据模型一填充当日数据

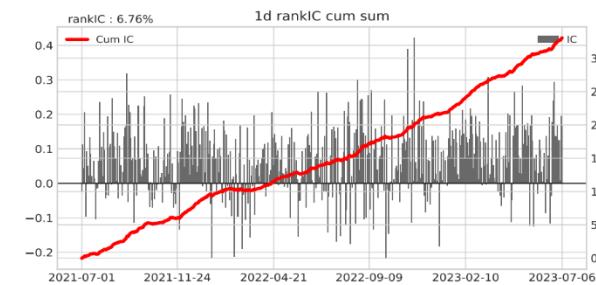
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	33.07	9.4	3.52	4.67	438.54
2	28.3	8.96	3.16	5.06	444.51
3	25.66	8.52	3.01	4.63	448.09
4	25.85	8.62	3.0	5.08	450.95
5	20.98	8.37	2.51	4.57	453.52
6	20.12	8.21	2.45	5.43	454.79
7	18.29	8.21	2.23	5.38	456.6
8	16.22	7.96	2.04	5.65	457.97
9	15.96	7.83	2.04	5.34	458.66
10	14.41	7.96	1.81	5.26	458.74
11	9.87	7.84	1.26	7.81	458.97
12	14.73	7.57	1.95	5.87	458.66
13	10.78	7.82	1.38	6.49	457.3
14	6.48	7.89	0.82	7.31	456.92
15	5.3	8.3	0.64	12.67	455.39
16	-1.3	7.99	-0.16	17.18	451.48
17	0.24	8.33	0.03	13.48	447.89
18	-6.78	9.41	-0.72	22.0	441.51
19	-26.5	10.42	-2.54	57.4	432.13
20	-91.19	13.61	-6.7	185.32	390.94
top - bottom	124.25	14.37	8.64	3.2	nan
long - short	60.21	9.91	6.07	3.07	nan



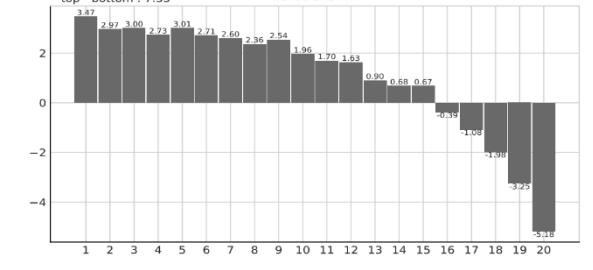
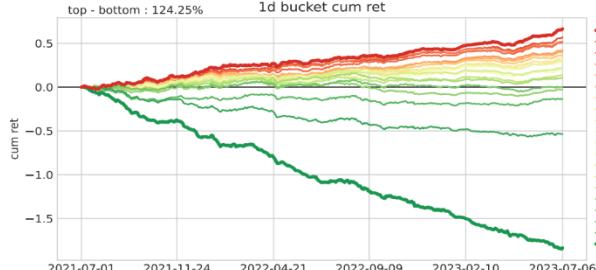
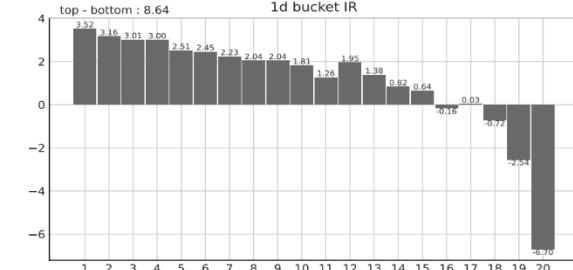
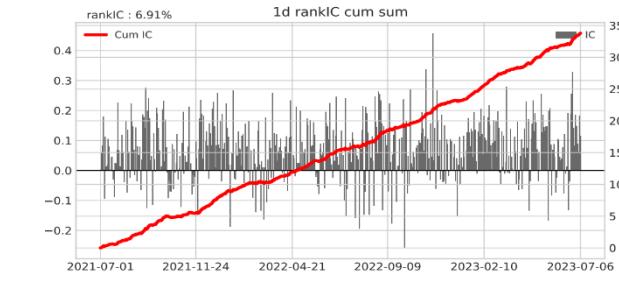
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	32.88	9.48	3.47	5.0	428.46
2	27.14	9.14	2.97	5.08	440.1
3	26.34	8.77	3.0	5.1	445.09
4	24.09	8.82	2.73	5.13	448.43
5	25.4	8.45	3.01	4.57	451.59
6	23.01	8.5	2.71	4.29	453.79
7	21.47	8.26	2.6	4.78	455.24
8	18.99	8.03	2.36	5.58	456.96
9	19.69	7.76	2.54	4.52	457.47
10	14.72	7.5	1.96	4.36	457.81
11	12.54	7.39	1.7	6.61	458.0
12	12.44	7.62	1.63	4.13	457.75
13	6.83	7.58	0.9	7.41	456.29
14	5.23	7.73	0.68	8.78	454.18
15	5.07	7.53	0.67	8.15	452.45
16	-3.04	7.89	-0.39	15.81	449.62
17	-9.34	8.65	-1.08	26.27	445.18
18	-18.5	9.36	-1.98	42.58	437.92
19	-35.4	10.88	-3.25	75.06	422.98
20	-69.12	13.34	-5.18	140.94	378.38
top - bottom	102.0	13.88	7.35	3.43	nan
long - short	58.98	9.66	6.11	2.69	nan



1d rankIC info				
date	mean(%)	std(%)	rate(%)	IR
2021	7.2	9.26	76.0	0.777883
2022	5.25	10.65	71.07	0.493138
2023	9.31	8.63	86.07	1.077969



1d rankIC info				
date	mean(%)	std(%)	rate(%)	IR
2021	6.7	9.45	76.0	0.708744
2022	6.11	10.21	76.03	0.598835
2023	8.71	9.04	82.79	0.963183



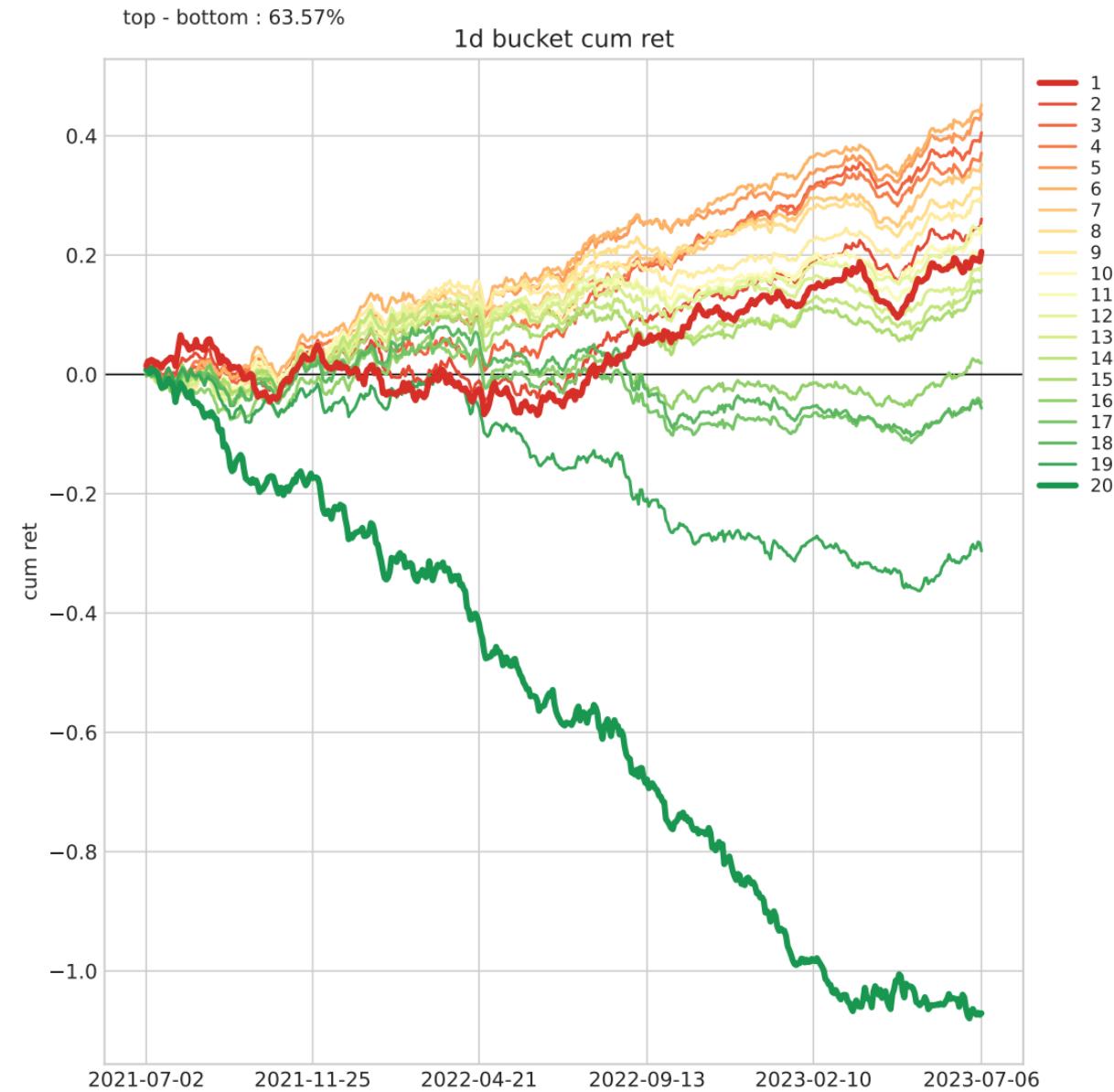
PatchTST 1m pred1 window1 MSE

PatchTST 1m pred1 window2 IC

01

基础数据模型—预测当日数据

1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	10.24	10.53	0.97	13.41	347.54
2	12.97	9.05	1.43	10.29	411.05
3	20.18	8.74	2.31	7.16	428.02
4	18.49	8.37	2.21	5.71	435.26
5	21.76	8.19	2.66	4.51	439.83
6	22.5	8.18	2.75	5.18	443.32
7	17.54	8.27	2.12	5.47	444.53
8	15.99	8.11	1.97	6.2	447.17
9	14.87	7.84	1.9	5.01	446.53
10	12.22	7.92	1.54	5.39	447.33
11	10.38	7.96	1.3	7.29	446.22
12	12.4	8.23	1.51	6.69	446.19
13	8.99	8.2	1.1	7.28	446.41
14	7.94	8.42	0.94	8.19	444.57
15	7.01	8.16	0.86	7.48	441.1
16	0.96	8.63	0.11	12.23	436.66
17	-2.3	8.57	-0.27	17.63	429.13
18	-2.83	9.23	-0.31	18.45	416.53
19	-14.74	10.14	-1.45	37.42	387.53
20	-53.33	14.24	-3.75	109.41	262.5
top - bottom	63.57	15.22	4.18	14.49	nan
long - short	35.83	10.02	3.58	7.76	nan



01

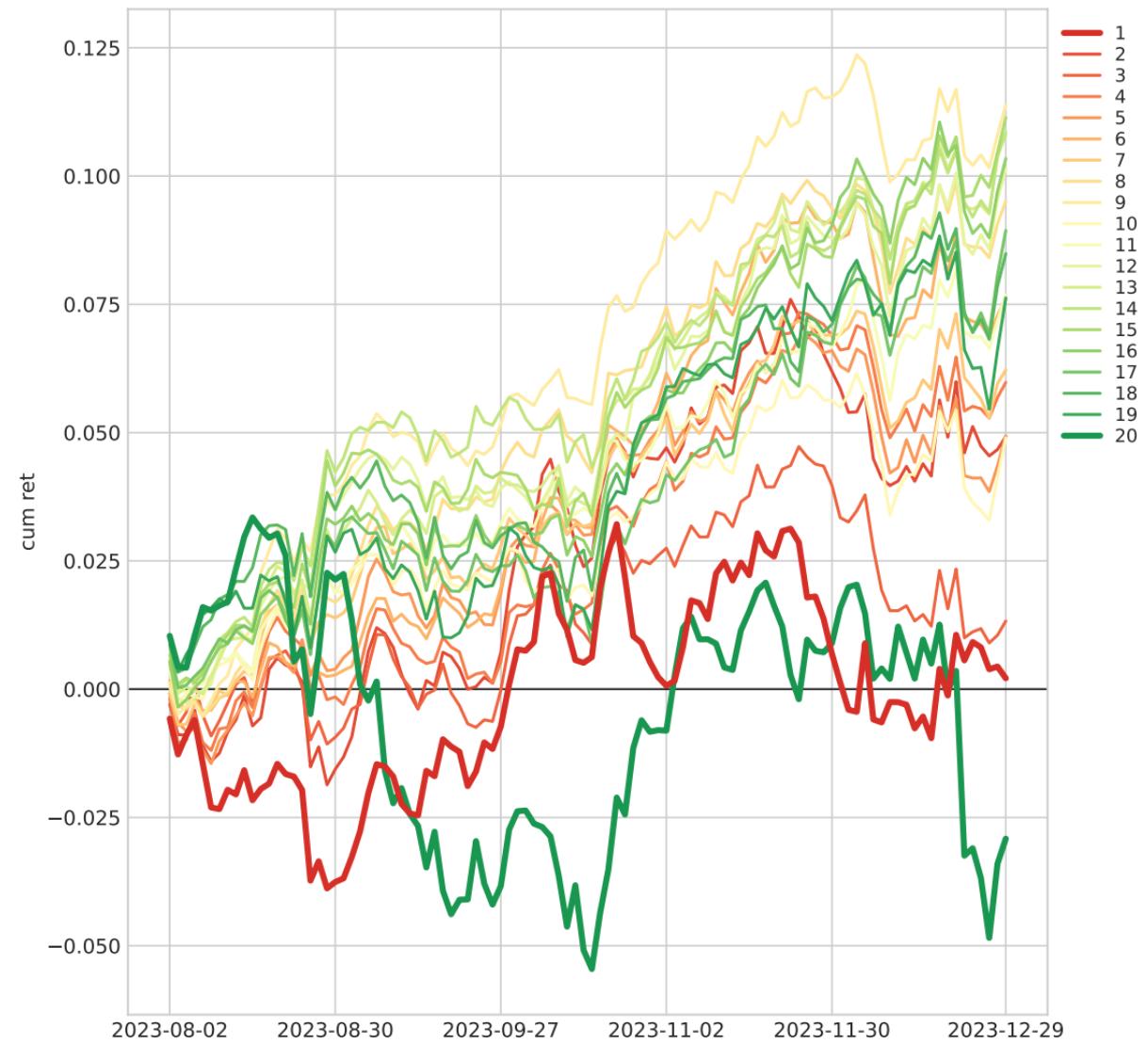
基础数据模型—去掉头部数据

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	0.5	9.14	0.06	4.17	288.65
2	11.72	8.46	1.39	3.63	392.1
3	3.16	6.95	0.46	3.83	417.25
4	14.25	6.65	2.14	2.44	428.08
5	11.76	6.59	1.78	3.03	434.54
6	18.12	6.66	2.72	2.63	438.25
7	14.83	6.07	2.44	2.28	440.75
8	22.66	6.2	3.66	2.2	441.07
9	27.11	6.09	4.45	2.48	443.18
10	11.67	6.15	1.9	2.86	443.22
11	18.31	6.06	3.02	2.36	443.7
12	24.17	6.58	3.67	2.21	443.42
13	25.72	6.4	4.02	2.0	442.12
14	25.87	6.46	4.0	1.37	438.31
15	26.54	6.93	3.83	1.7	436.93
16	24.64	6.59	3.74	2.26	430.11
17	21.3	7.49	2.84	2.47	422.84
18	20.22	7.78	2.6	2.74	407.81
19	18.17	8.53	2.13	3.38	370.22
20	-6.94	12.61	-0.55	8.8	225.55
top - bottom	7.45	14.34	0.52	8.81	nan
long - short	-3.75	8.8	-0.43	5.72	nan

top - bottom : 7.45%

1d bucket cum ret



5m-15m, patchtst, pred5 window10, hidden dim 64、128, MSE 21-07-01--23-07-06							
		5m		10m		15m	
		64	128	64	128	64	128
fill	ret	16.14 (26.94)	25.11 (26.67)	16.4 (26.65)	29.53	18.54 (24.52)	26.96 (28.58)
	dd	10.29	12.31	10.37	5.17	10.37	7.93
tomorrow	ret	19.69 (26.34)	22.39	18.73 (23.1)	27.76	23.82	18.95 (24.64)
	dd	13.24	9.53	10.93	7.32	8.89	10.62
today	ret	8.47 (19.33)	13.27 (20.38)	11.6 (22.15)	11.29 (19.49)	11.97 (20.24)	18.59
	dd	9.37	11.62	11.04	8.45	9.99	9.15

未来研究方向

- 1、选取计算快，复杂度低的更优模型。
- 2、寻找稳定的训练数据结构和填充方式。

PART / 02

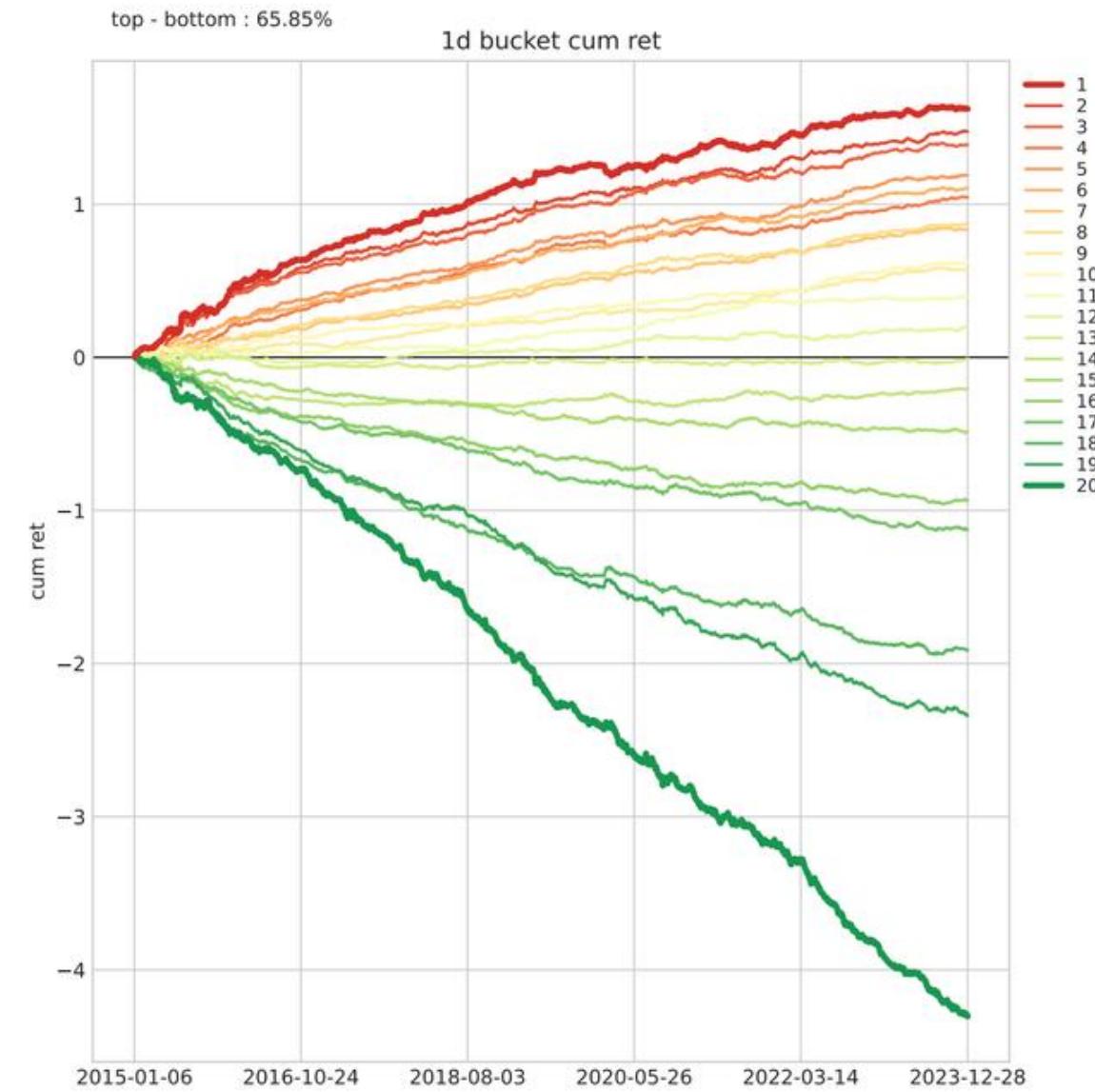
因子数据模型



名称	含义	方向	rankic	名称	含义	方向	rankic
late_skew_ret	尾盘收益率偏度	-1	2.2	down_single_amt_perc	下行单笔成交金额占比	1	-0.94
down_vol_perc	下行收益率波动占比	1	4.13	corr_volume_amplitude	成交量与振幅的相关性	-1	4.25
corr_ret_lastret	前后两分钟收益率的相关性	-1	4.68	bigorder_amt_perc	大单成交金额占比	1	-1.41
corr_close_nextopen	前一分钟收盘价与后一分钟开盘价相关性	1	-1.73	early_bigorder_buy_perc	早盘大单买入占比	1	-1.01
volume_perc2	第2个半小时成交量占全天成交量比例	1	0.45	concentration_diff	买卖单集中度之差	-1	-1.59
volume_perc3	第3个半小时成交量占全天成交量比例	1	3.11	early_active_buy_perc	早盘主动买入占比	1	0.59
volume_perc4	第4个半小时成交量占全天成交量比例	1	3.80	corr_netactivebuy_lastret	后一分钟净主动买入与前一分钟收益率的相关性	-1	4.92
volume_perc5	第5个半小时成交量占全天成交量比例	1	3.57	corr_netactivebuy_nextret	前一分钟净主动买入与后一分钟收益率的相关性	-1	2.88
volume_perc6	第6个半小时成交量占全天成交量比例	1	3.46	kurt_order_diff	买卖单委托量峰度之差	-1	1.82
volume_perc7	第7个半小时成交量占全天成交量比例	1	3.47	skew_order_df	买卖单委托量偏度之差	-1	1.90
corr_volume_item	成交量与成交笔数的相关性	-1	6.64	early_kurt_order_diff	早盘委托量的峰度	-1	2.20
bigorder_ret	大单推动涨幅	-1	4.85	corr_buyorder_volume_price	买单委托量与委托价格的相关性	-1	3.64

因子数据模型—平均合成benchmark

1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	18.03	7.14	2.53	7.91	67.9
2	16.38	5.85	2.8	4.91	167.56
3	15.43	5.1	3.03	5.26	224.88
4	11.6	4.98	2.33	6.65	259.94
5	13.2	4.48	2.95	4.4	282.87
6	12.29	4.12	2.98	4.5	298.22
7	9.25	3.9	2.37	2.93	309.02
8	9.79	3.75	2.61	5.73	315.91
9	6.35	3.56	1.79	4.51	319.16
10	6.97	3.47	2.01	5.54	320.97
11	4.48	3.3	1.36	4.17	320.31
12	2.25	3.4	0.66	10.57	318.36
13	-0.09	4.1	-0.02	10.66	314.31
14	-2.27	3.99	-0.57	33.04	306.88
15	-5.36	3.98	-1.34	49.05	295.36
16	-10.38	4.7	-2.21	95.62	279.1
17	-12.54	5.25	-2.39	113.17	255.98
18	-21.24	6.36	-3.34	194.19	221.63
19	-25.98	7.88	-3.3	233.83	166.23
20	-47.82	12.7	-3.76	430.96	68.89
top - bottom	65.85	17.67	3.73	11.24	nan
long - short	39.39	9.92	3.97	6.77	nan

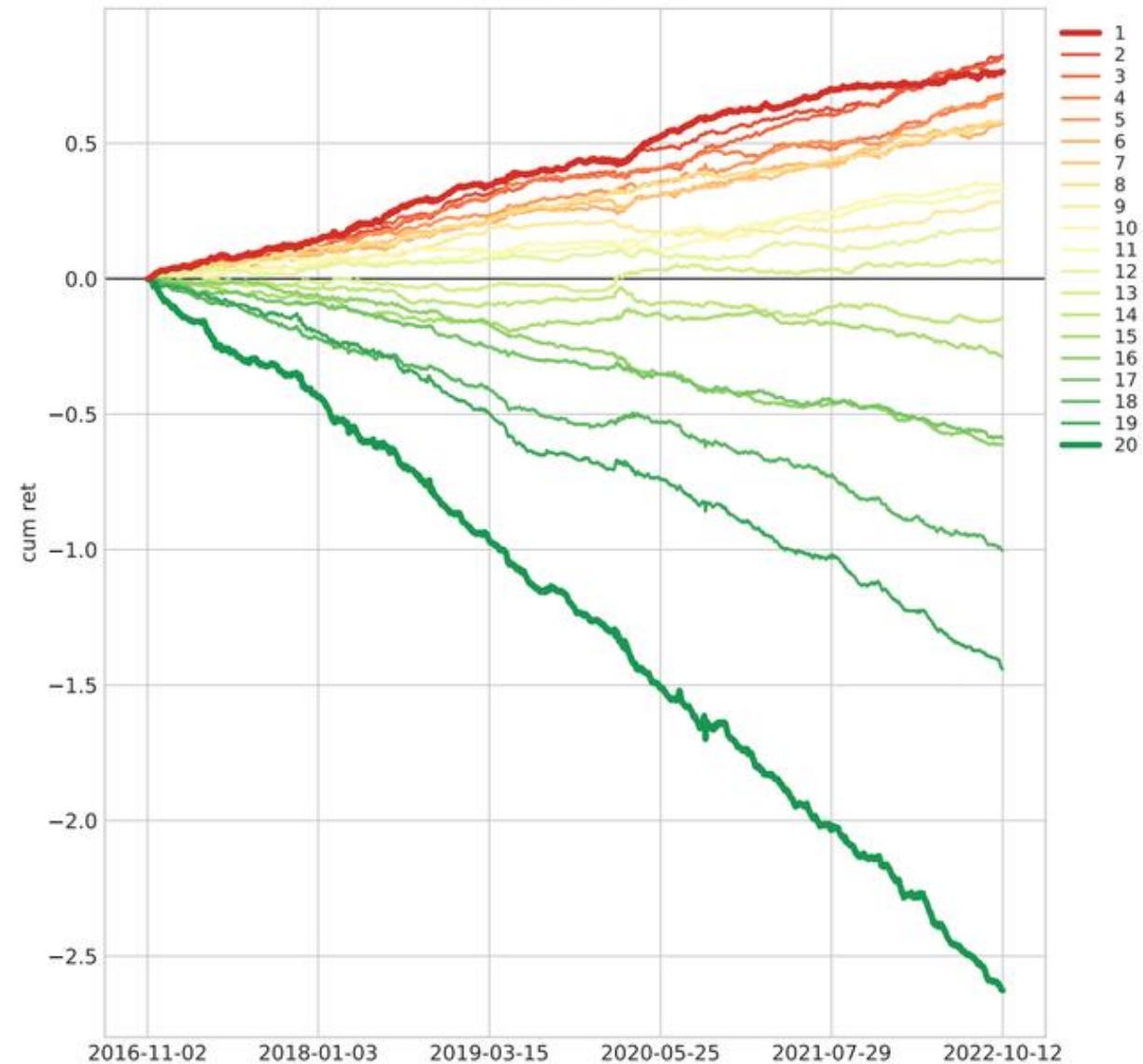


1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	12.87	3.83	3.36	2.21	72.62
2	13.87	3.58	3.88	2.04	172.88
3	13.71	3.75	3.65	2.46	230.84
4	11.46	3.64	3.15	2.69	265.79
5	11.25	3.6	3.13	3.49	287.68
6	9.63	3.44	2.8	3.09	299.72
7	9.81	3.37	2.91	3.92	309.54
8	9.8	3.28	2.99	2.29	315.01
9	4.91	3.07	1.6	6.3	316.59
10	5.86	3.19	1.84	3.8	316.82
11	5.5	2.95	1.86	2.77	314.59
12	3.19	2.9	1.1	4.19	309.81
13	1.09	3.06	0.36	5.51	304.13
14	-2.41	3.18	-0.76	16.28	293.87
15	-4.8	3.28	-1.46	28.71	282.11
16	-10.25	3.62	-2.83	61.98	263.82
17	-9.93	4.04	-2.46	58.9	241.48
18	-16.88	4.88	-3.46	100.59	207.82
19	-24.25	5.87	-4.13	144.52	156.37
20	-44.18	8.51	-5.19	262.7	68.27
top - bottom	57.04	10.39	5.49	7.2	nan
long - short	19.43	3.91	4.97	2.78	nan

top - bottom : 57.04%

1d bucket cum ret



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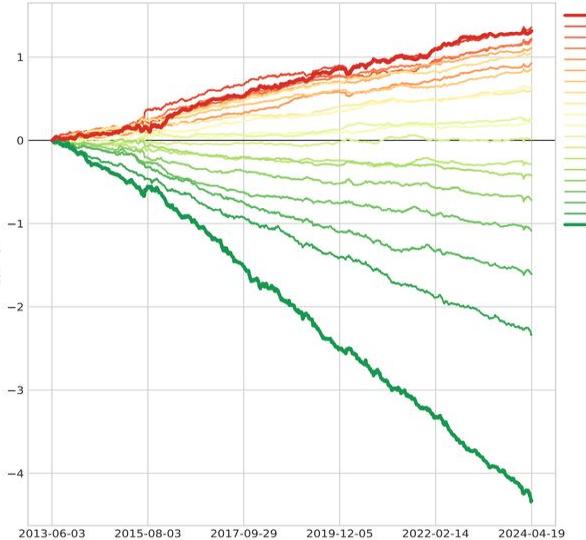
因子数据模型—数据提升

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	12.08	7.34	1.64	8.43	46.91
2	12.46	6.28	1.98	8.31	116.87
3	11.2	5.24	2.13	5.53	162.65
4	11.07	4.99	2.22	6.4	193.94
5	8.49	4.64	1.83	6.31	216.29
6	10.15	4.18	2.43	3.07	230.44
7	7.84	3.96	1.98	4.23	238.87
8	9.68	3.77	2.57	3.71	244.34
9	5.6	3.82	1.47	5.29	246.18
10	5.97	3.45	1.73	4.25	245.11
11	2.19	3.49	0.63	9.69	241.5
12	2.33	3.74	0.62	6.36	235.7
13	0.09	3.78	0.02	10.14	227.01
14	-2.61	3.93	-0.66	31.95	214.83
15	-3.83	4.13	-0.93	47.98	199.06
16	-6.64	4.82	-1.38	74.16	179.58
17	-9.97	5.41	-1.84	108.46	154.43
18	-14.79	6.37	-2.32	163.05	122.91
19	-21.45	7.65	-2.81	234.05	85.36
20	-39.73	11.16	-3.56	434.61	35.46
top - bottom	51.81	16.27	3.19	17.13	nan
long - short	30.42	9.08	3.35	8.64	nan

top - bottom : 51.81%

1d bucket cum ret

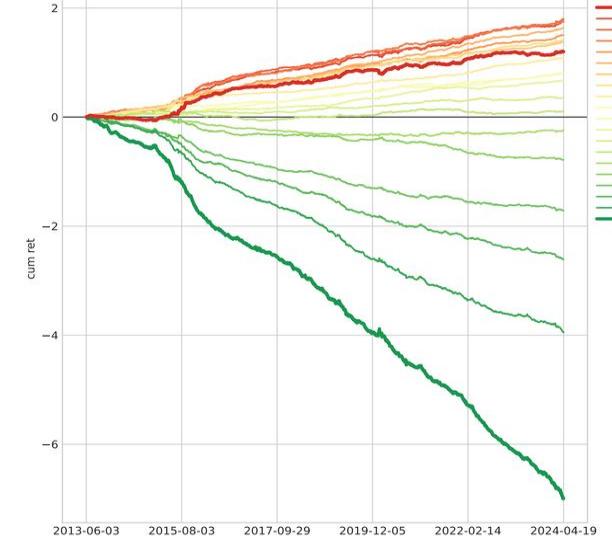


1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	11.02	6.79	1.62	10.04	386.31
2	16.09	5.71	2.82	4.96	428.64
3	16.52	5.37	3.08	7.53	440.19
4	16.14	4.82	3.35	3.97	445.53
5	13.78	4.79	2.88	7.41	449.38
6	15.0	4.18	3.59	5.9	451.66
7	12.65	3.97	3.19	2.65	453.04
8	13.01	3.79	3.44	2.71	454.05
9	10.01	3.8	2.64	3.47	454.71
10	7.46	3.58	2.09	7.91	455.3
11	7.51	3.39	2.21	5.25	454.65
12	6.22	3.45	1.8	6.83	454.49
13	3.32	3.54	0.94	5.06	453.17
14	1.05	3.79	0.28	19.66	452.42
15	-2.17	4.16	-0.52	34.89	449.44
16	-7.15	5.16	-1.39	80.03	445.77
17	-15.75	5.56	-2.83	172.0	440.34
18	-23.96	6.67	-3.59	261.47	429.61
19	-36.27	8.8	-4.12	398.46	408.43
20	-64.22	13.13	-4.89	700.53	316.97
top - bottom	75.24	17.65	4.26	19.39	nan
long - short	36.06	9.44	3.82	7.11	nan

top - bottom : 75.24%

1d bucket cum ret



取20日均值、去极值、行业市值中性化、标准化

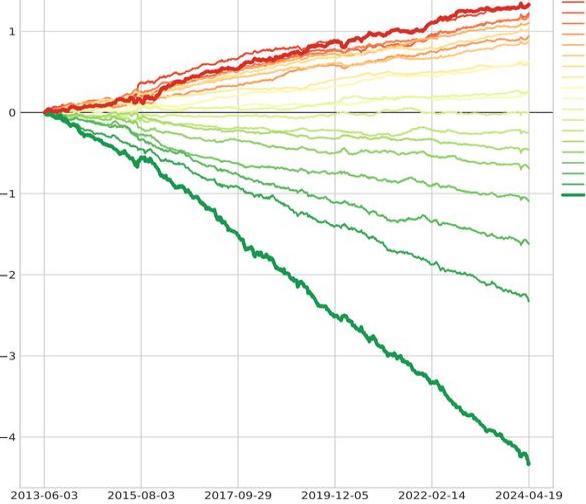
未处理

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	12.21	7.34	1.66	8.38	46.93
2	12.35	6.29	1.96	8.07	116.91
3	11.21	5.25	2.14	5.64	162.7
4	11.02	4.97	2.22	6.47	193.97
5	8.64	4.6	1.88	5.69	216.29
6	10.13	4.16	2.44	3.28	230.56
7	8.02	3.98	2.01	3.86	238.85
8	9.44	3.69	2.56	4.86	244.27
9	5.61	3.97	1.41	5.64	246.21
10	5.77	3.48	1.66	4.71	245.17
11	2.25	3.52	0.64	8.85	241.56
12	2.32	3.75	0.62	6.12	235.86
13	-0.07	3.85	-0.02	9.78	227.23
14	-2.29	3.97	-0.58	29.18	214.91
15	-4.15	4.13	-1.01	50.61	199.05
16	-6.35	4.84	-1.31	73.43	179.52
17	-10.04	5.37	-1.87	109.26	154.48
18	-14.9	6.39	-2.33	164.74	123.07
19	-21.35	7.64	-2.8	233.0	85.35
20	-39.71	11.14	-3.56	434.31	35.4
top - bottom	51.91	16.25	3.19	16.93	nan
long - short	30.43	9.07	3.35	8.64	nan

top - bottom : 51.91%

1d bucket cum ret

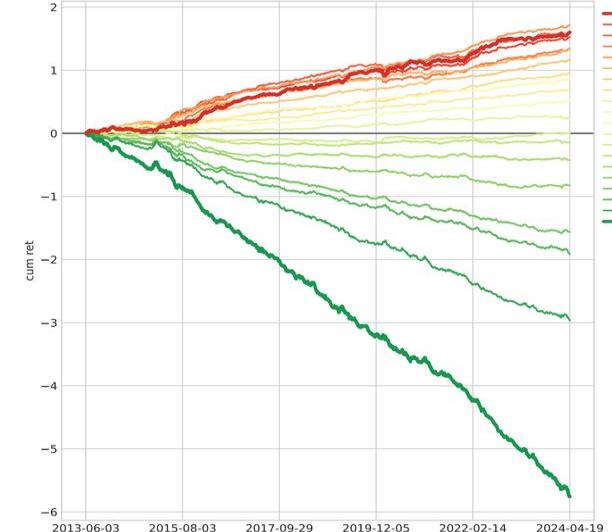


1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	14.72	7.69	1.91	9.0	77.9
2	13.99	6.74	2.07	11.78	190.92
3	14.72	5.99	2.46	10.58	249.01
4	12.33	5.54	2.22	7.79	280.75
5	15.77	5.17	3.05	4.81	299.39
6	12.23	4.54	2.7	5.55	311.49
7	10.77	4.41	2.44	6.8	319.33
8	8.76	3.93	2.23	3.21	323.28
9	6.59	3.74	1.76	5.28	324.68
10	8.01	3.52	2.27	3.85	322.75
11	4.89	3.67	1.33	10.03	320.01
12	2.28	3.6	0.63	7.72	314.66
13	-0.01	3.84	-0.0	14.67	305.56
14	-1.23	3.93	-0.31	25.68	294.42
15	-3.88	4.39	-0.88	43.07	278.86
16	-7.6	5.15	-1.48	86.9	256.99
17	-14.37	5.95	-2.42	158.06	227.43
18	-17.62	7.22	-2.44	191.85	188.46
19	-27.23	9.42	-2.89	296.92	135.66
20	-52.85	13.91	-3.8	576.51	55.31
top - bottom	67.57	19.63	3.44	14.23	nan
long - short	35.8	11.12	3.22	9.5	nan

top - bottom : 67.57%

1d bucket cum ret



不去极值

不中性化

以不同处理的因子进行试验						
	均值、去极 值、中性 化、标准化	不处理	不去极值	不中性化	不平均	不中性化、 不平均
1d ret	10.5	9.77	10.4	13.78	11.36	12.2
1d IC	3.19	2.79	3.18	3.23	2.30	3.01
5d IC	5.34	4.55	5.39	5.70	3.79	5.22
10d IC	6.25	4.91	6.26	6.80	5.32	6.03

对数据做不同处理有助于提升但不是关键

PRED 与模型超参数 window 40

pred	3		5		10		15		20	
layer	1	2	1	2	1	2	1	2	1	2
ret	11.25	12.01	15.94	17.92	13.86	13.65	13.15	10.34	10.96	11.15
1d ic	3.17	3.44	3.15	5.42	4.25	3.71	3.69	3.32	3.51	2.97
5d ic	5.00	5.12	4.94	8.27	6.86	6.12	5.92	5.50	5.91	4.88
10d ic	5.61	5.83	5.66	9.11	7.60	7.18	6.83	6.36	6.93	5.69

PRED 与模型超参数 window 50

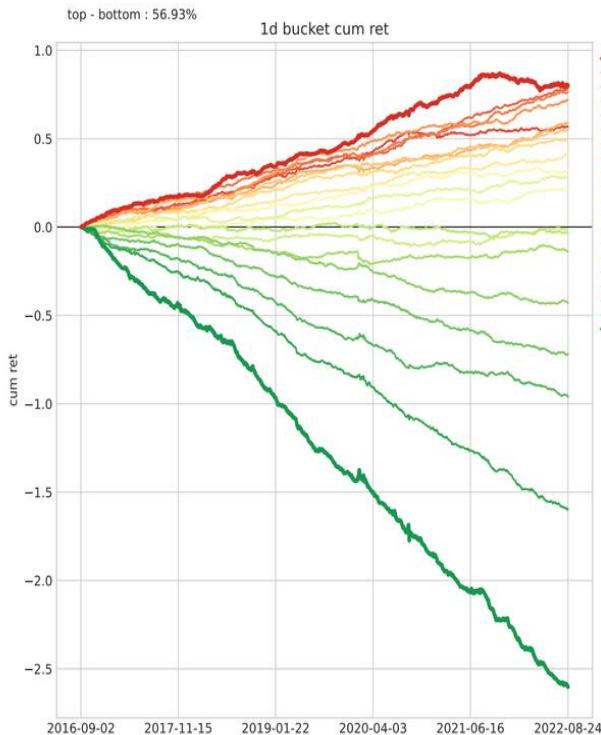
pred	3		5		10		15		20	
layer	1	2	1	2	1	2	1	2	1	2
ret	3.66	2.78	3.78	6.12	2.23	0.29	6.66	2.97	3.2	2.66
1d ic	3.01	2.75	3.31	3.00	2.50	1.21	3.66	1.74	3.57	1.84
5d ic	4.10	3.99	4.42	4.38	3.78	1.86	5.93	2.33	5.25	2.75
10d ic	4.25	4.06	4.50	4.78	4.35	2.10	6.73	2.38	5.89	3.03

GRU MSE



回归性损失(MSE)和排序型损失(IC)特性不同

1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	13.36	4.8	2.78	9.83	108.97
2	9.5	3.3	2.88	3.38	254.3
3	13.12	3.28	4.0	3.29	320.27
4	12.78	3.37	3.8	2.45	353.65
5	12.04	3.2	3.76	2.73	371.92
6	9.88	3.23	3.06	3.96	384.11
7	9.23	3.1	2.97	2.31	390.99
8	8.3	3.02	2.75	2.82	394.88
9	7.05	2.91	2.42	2.15	397.09
10	5.35	3.02	1.77	3.36	398.65
11	3.54	2.97	1.19	3.58	398.14
12	4.79	3.02	1.58	4.09	395.28
13	-0.24	2.96	-0.08	10.58	390.9
14	-0.56	3.07	-0.18	8.23	385.27
15	-2.31	3.41	-0.68	21.02	375.27
16	-7.2	3.2	-2.25	44.54	362.47
17	-12.03	3.6	-3.34	72.15	341.91
18	-16.08	4.17	-3.85	96.28	306.38
19	-26.72	5.08	-5.26	159.83	241.32
20	-43.57	8.09	-5.38	260.45	106.41
top - bottom	56.93	9.01	6.32	6.08	nan
long - short	36.9	5.63	6.55	5.15	nan

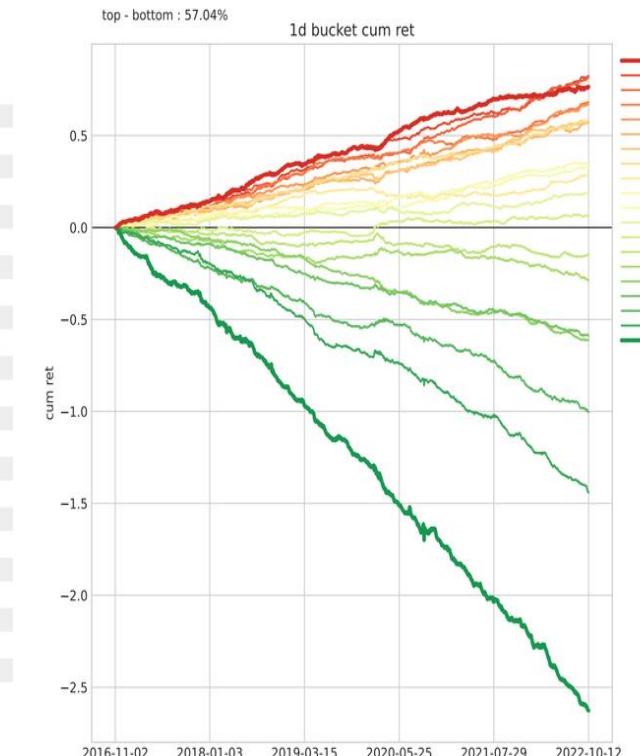


-IC

top - bottom : 57.04%

1d bucket info

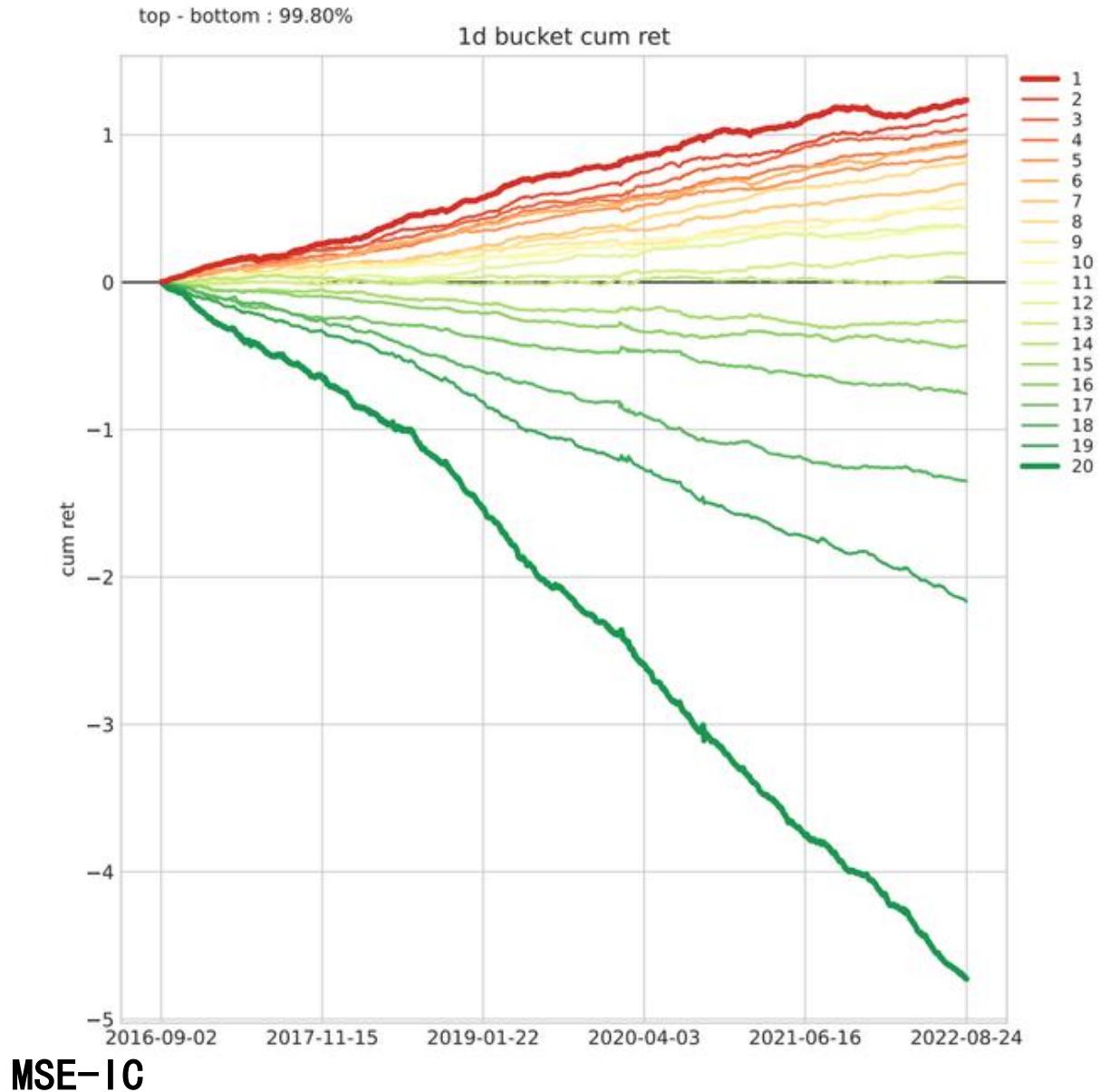
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	12.87	3.83	3.36	2.21	72.62
2	13.87	3.58	3.88	2.04	172.88
3	13.71	3.75	3.65	2.46	230.84
4	11.46	3.64	3.15	2.69	265.79
5	11.25	3.6	3.13	3.49	287.68
6	9.63	3.44	2.8	3.09	299.72
7	9.81	3.37	2.91	3.92	309.54
8	9.8	3.28	2.99	2.29	315.01
9	4.91	3.07	1.6	6.3	316.59
10	5.86	3.19	1.84	3.8	316.82
11	5.5	2.95	1.86	2.77	314.59
12	3.19	2.9	1.1	4.19	309.81
13	1.09	3.06	0.36	5.51	304.13
14	-2.41	3.18	-0.76	16.28	293.87
15	-4.8	3.28	-1.46	28.71	282.11
16	-10.25	3.62	-2.83	61.98	263.82
17	-9.93	4.04	-2.46	58.9	241.48
18	-16.88	4.88	-3.46	100.59	207.82
19	-24.25	5.87	-4.13	144.52	156.37
20	-44.18	8.51	-5.19	262.7	68.27
top - bottom	57.04	10.39	5.49	7.2	nan
long - short	19.43	3.91	4.97	2.78	nan



MSE

02 / 因子数据模型—模型提升 (损失函数MSE-IC)

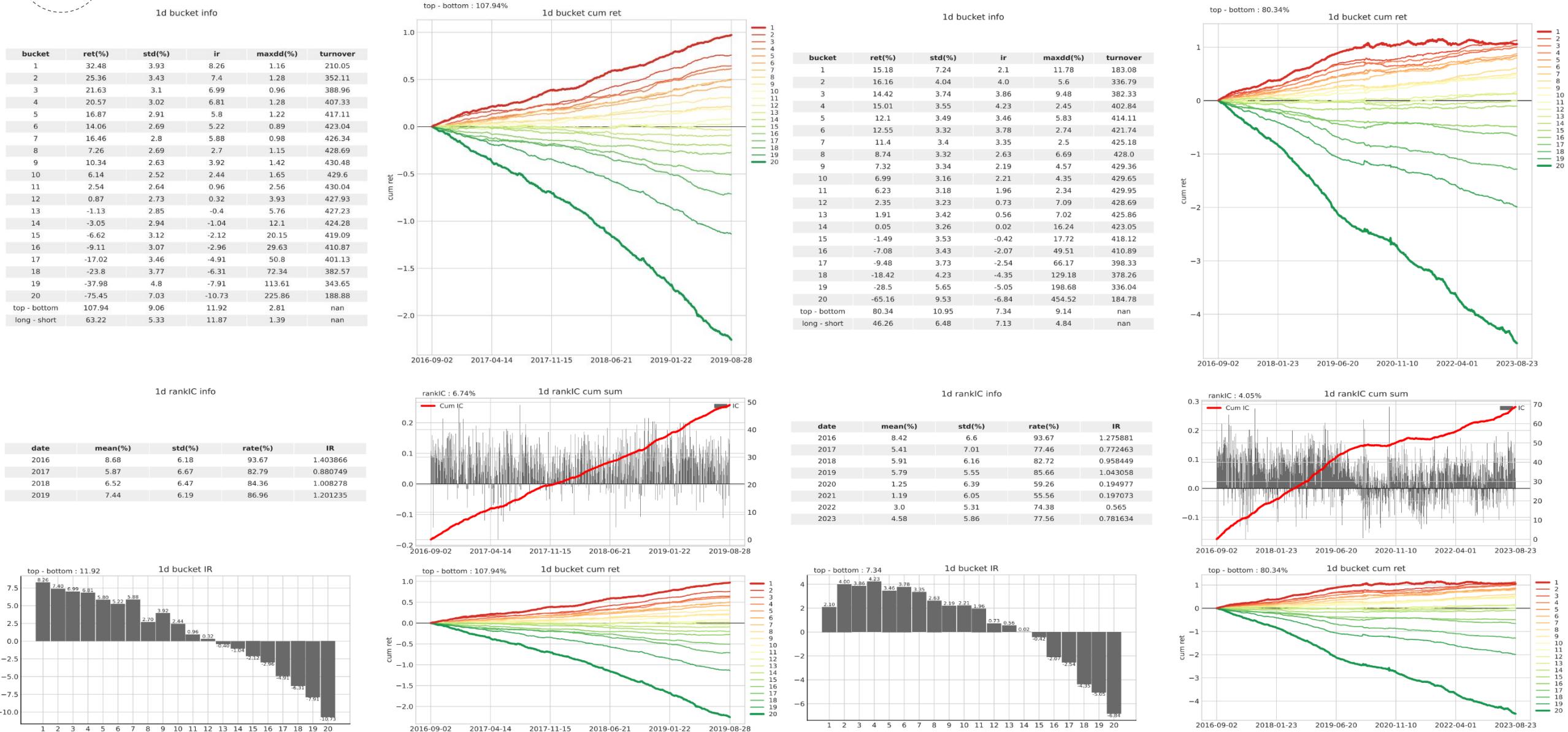
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	20.69	4.58	4.51	6.74	180.77
2	19.01	3.84	4.95	2.84	325.19
3	17.42	3.58	4.87	2.09	370.17
4	16.08	3.38	4.75	2.08	391.39
5	14.49	3.17	4.56	2.63	401.87
6	15.83	3.22	4.92	3.48	409.83
7	11.16	3.29	3.39	3.83	414.48
8	13.61	3.17	4.29	3.0	418.23
9	8.49	3.16	2.69	4.62	418.51
10	9.43	3.12	3.02	2.39	419.26
11	6.43	2.91	2.21	5.51	418.01
12	6.36	3.0	2.12	2.91	416.92
13	3.33	3.01	1.11	3.27	413.4
14	0.25	3.11	0.08	6.76	408.89
15	-4.42	3.41	-1.3	31.7	401.66
16	-7.19	3.39	-2.12	44.47	392.19
17	-12.69	3.9	-3.25	75.43	377.48
18	-22.63	4.92	-4.6	135.44	352.28
19	-36.21	5.81	-6.23	216.31	300.08
20	-79.11	10.02	-7.9	472.85	153.77
top - bottom	99.8	11.76	8.49	6.25	nan
long - short	54.39	6.49	8.38	3.36	nan



-IC+k*MSE								
k	0	0.25	0.5	1	2	4	inf	linear
1d ret	13.36	12.92 (18.11)	16.06 (21.45)	20.69	18.49 (18.87)	18.46 (20.4)	13.78	18.03
1d IC	3.01	3.94	4.39	4.34	4.27	4.43	3.23	4.08
5d IC	4.91	6.48	6.98	6.99	6.92	7.27	5.70	<u>7.65</u>
10d IC	5.70	7.36	7.89	7.93	7.95	8.31	6.80	<u>9.29</u>

02

因子数据模型—模型提升（损失函数）

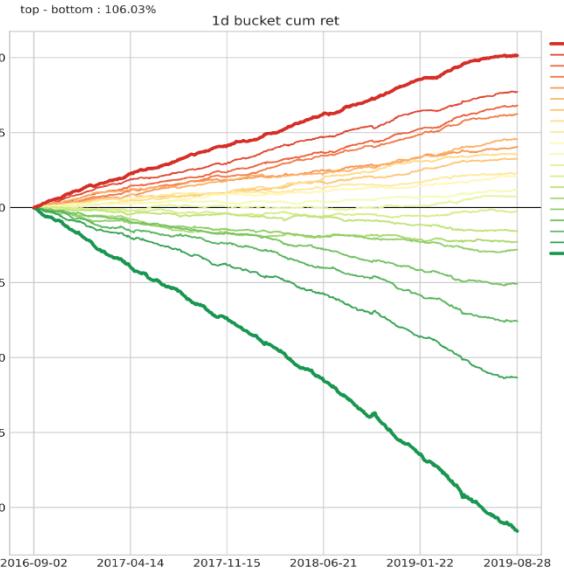


HuberLoss (MAE+MSE)

02

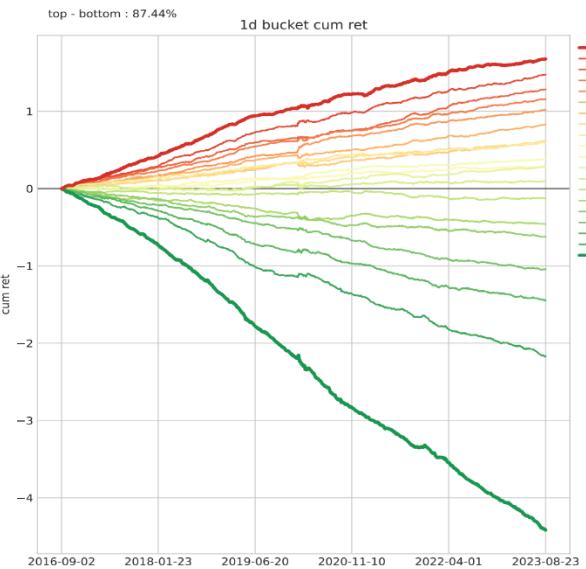
因子数据模型—模型提升（损失函数）

1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	33.89	3.73	9.09	1.19	242.64
2	25.82	3.44	7.51	1.73	375.07
3	22.77	3.18	7.15	1.41	406.42
4	20.89	3.1	6.74	1.32	419.87
5	13.56	2.95	4.6	1.47	426.88
6	15.24	2.95	5.17	2.39	432.07
7	10.88	2.88	3.78	2.13	435.81
8	11.86	2.75	4.32	1.25	438.14
9	7.52	2.65	2.84	1.92	438.65
10	7.05	2.55	2.76	1.65	438.73
11	4.05	2.54	1.6	2.84	438.3
12	2.52	2.7	0.93	3.6	438.37
13	-0.89	2.89	-0.31	7.38	437.23
14	-5.18	3.1	-1.67	16.05	433.97
15	-7.7	3.3	-2.33	23.46	430.35
16	-9.4	3.41	-2.76	29.91	425.11
17	-17.01	3.69	-4.61	52.18	418.33
18	-25.37	4.37	-5.8	76.36	402.96
19	-37.95	4.86	-7.8	113.75	373.27
20	-72.14	6.34	-11.37	215.57	244.08
top - bottom	106.03	8.5	12.48	2.77	nan
long - short	60.22	5.26	11.45	2.48	nan



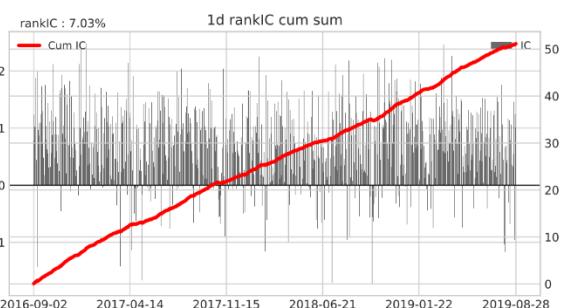
1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	24.06	4.31	5.58	3.7	265.88
2	21.15	4.09	5.17	2.58	384.42
3	18.42	3.56	5.17	2.74	411.24
4	16.6	3.65	4.55	4.78	423.97
5	14.69	3.66	4.01	2.06	431.11
6	11.93	3.26	3.66	3.88	435.72
7	8.8	3.16	2.78	6.1	438.28
8	8.87	3.18	2.79	2.75	441.21
9	8.62	3.2	2.69	2.39	442.25
10	4.18	3.12	1.34	4.32	442.17
11	5.43	3.07	1.77	2.53	442.21
12	4.04	3.29	1.23	5.08	441.66
13	1.38	3.28	0.42	6.38	440.6
14	-1.9	3.4	-0.56	15.18	437.96
15	-6.61	3.72	-1.78	46.51	434.63
16	-8.94	3.93	-2.27	62.39	429.75
17	-14.93	4.17	-3.58	104.79	421.89
18	-20.82	4.79	-4.35	145.11	408.3
19	-31.12	5.43	-5.74	217.28	380.63
20	-63.38	7.09	-8.94	441.64	254.27
top - bottom	87.44	9.48	9.23	4.83	nan
long - short	50.24	5.68	8.85	3.02	nan



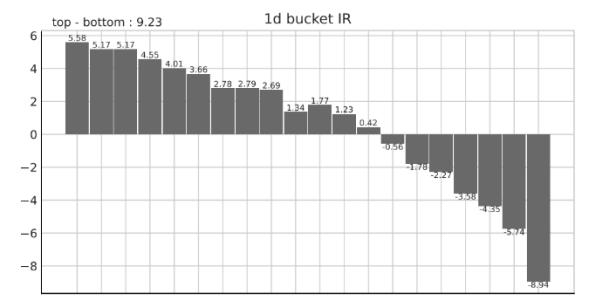
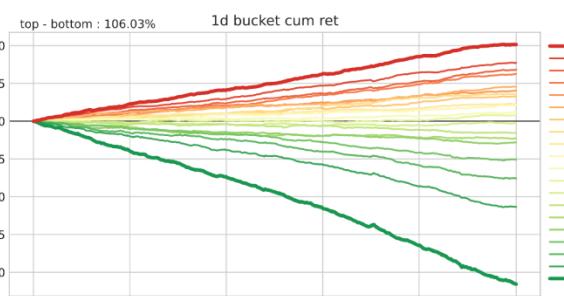
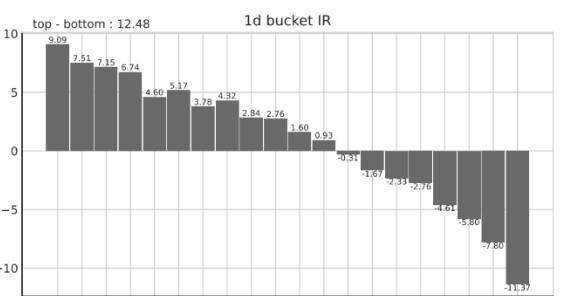
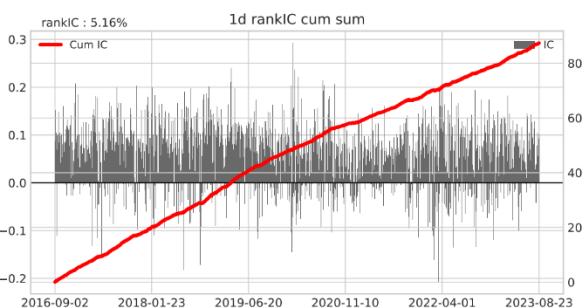
1d rankIC info

date	mean(%)	std(%)	rate(%)	IR
2016	9.28	6.37	93.67	1.45607
2017	6.65	6.59	83.2	1.008665
2018	6.5	7.22	83.54	0.899625
2019	7.34	6.25	90.68	1.17338



1d rankIC info

date	mean(%)	std(%)	rate(%)	IR
2016	6.44	5.07	91.14	1.271428
2017	5.61	6.05	81.56	0.92789
2018	5.79	6.94	83.13	0.833983
2019	6.07	5.61	84.84	1.08245
2020	4.41	6.74	73.25	0.65465
2021	4.24	4.94	81.07	0.858327
2022	4.3	7.23	75.21	0.595098
2023	5.33	5.32	85.26	1.00091



代码块

```
1  class PairwiseRankICLoss(nn.Module):
2      def __init__(self, margin=0.1, eps=1e-8):
3          super().__init__()
4          self.margin = margin
5          self.eps = eps
6      def forward(self, y_pred, y_true):
7          n = y_pred.size(0)
8          pred_diff = y_pred.unsqueeze(1) - y_pred.unsqueeze(0)
9          true_diff = y_true.unsqueeze(1) - y_true.unsqueeze(0)
10         prob_correct = torch.sigmoid(pred_diff * true_diff - self.margin)
11         target_matrix = (true_diff > 0).float()
12         loss = - (target_matrix * torch.log(prob_correct + self.eps) +
13                    (1 - target_matrix) * torch.log(1 - prob_correct + self.eps))
14         mask = torch.eye(n, device=y_pred.device) == 0
15         valid_loss = loss[mask].mean()
16         return valid_loss
```

未来研究方向

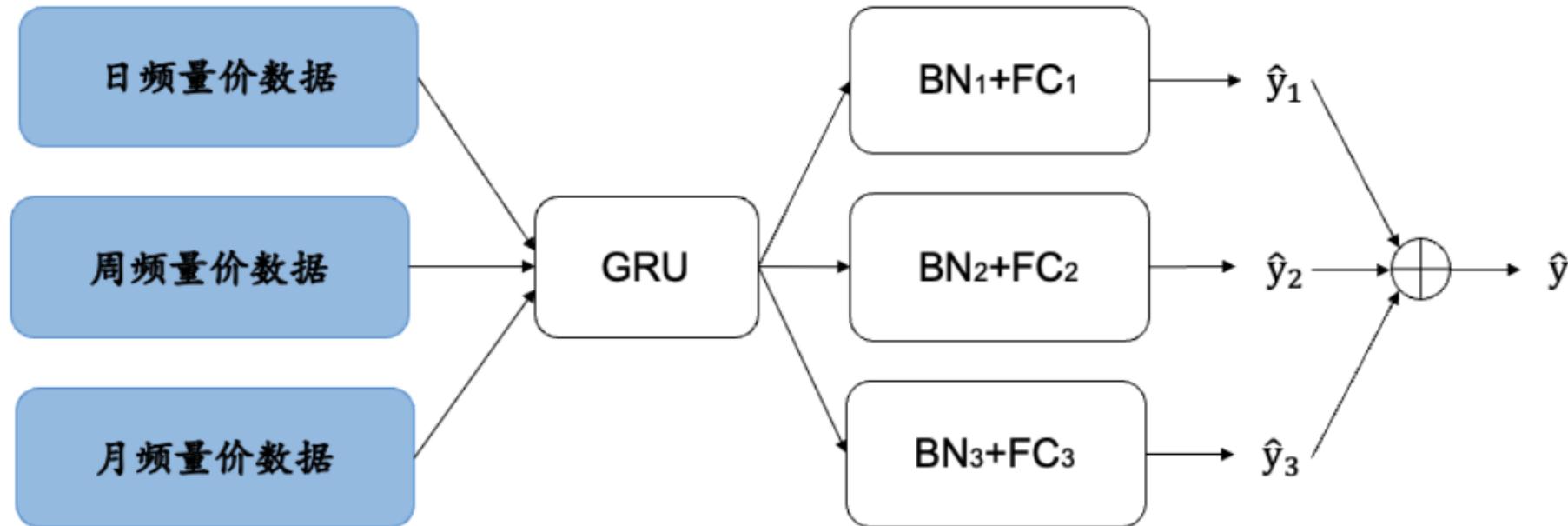
- 1、数据端创建更适合训练的因子数据结构。
- 2、寻找和因子数据和基础数据的融合方式(单、多模型)。
- 3、模型端寻找表达能力更强的损失函数和模型提升方式。

PART / 03

多任务低频量价模型

单个模型输入多种频率的信号

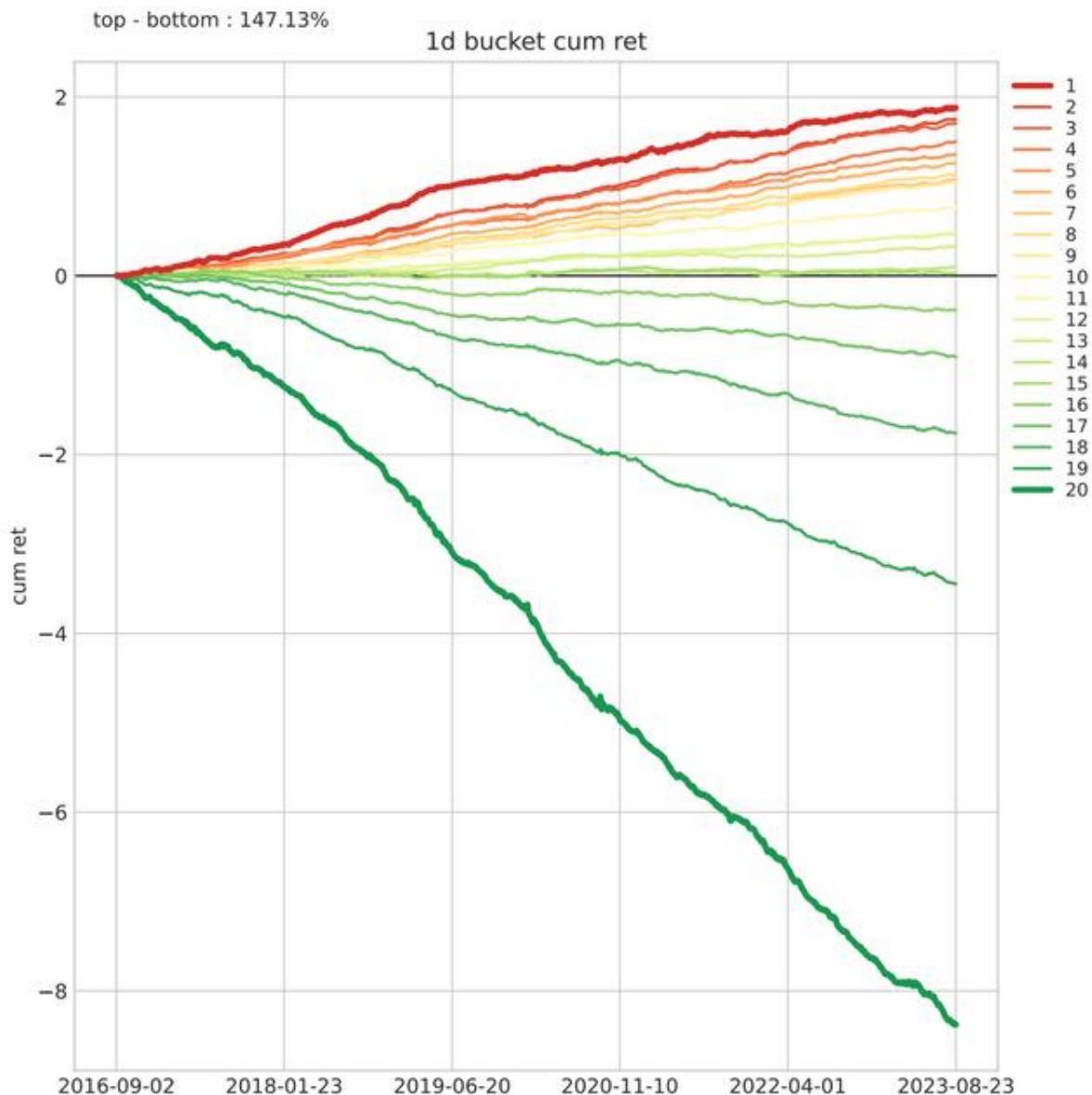




03

多任务低频量价模型—任务结果

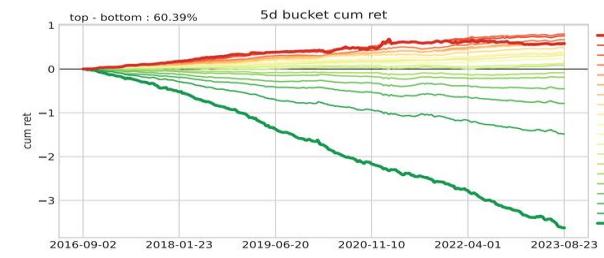
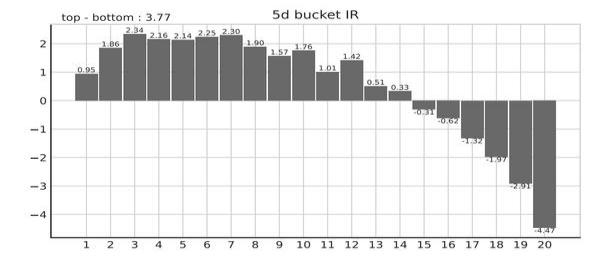
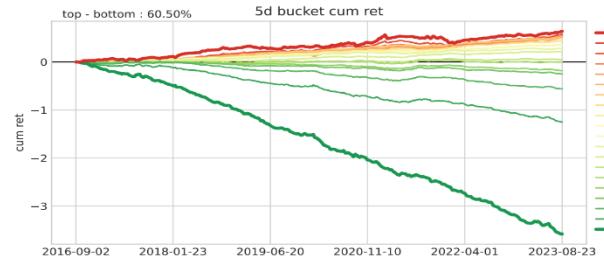
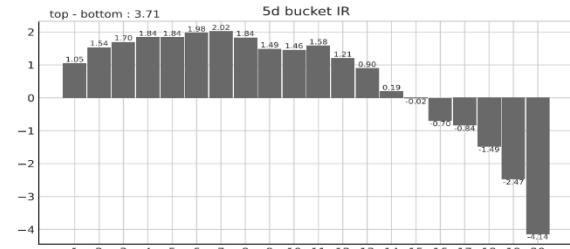
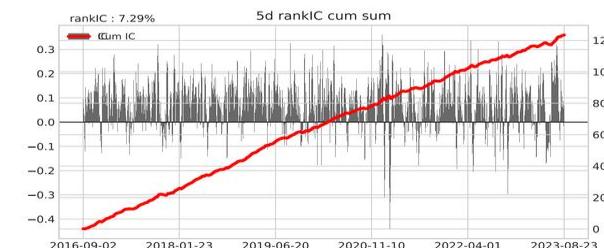
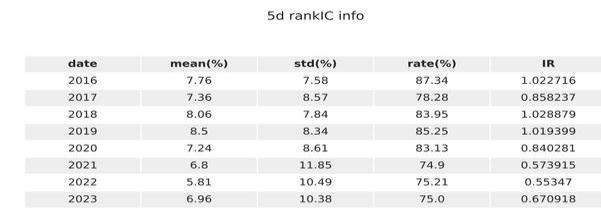
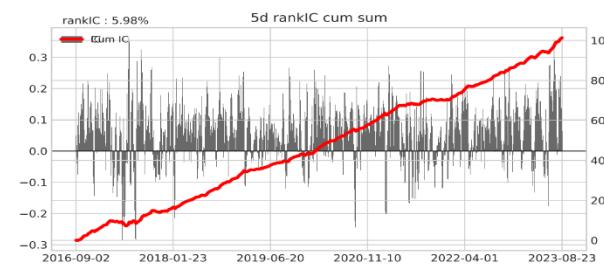
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	26.97	6.17	4.37	4.66	232.5
2	25.13	4.98	5.05	2.74	345.27
3	24.46	4.69	5.21	2.94	381.44
4	21.52	4.52	4.77	2.42	398.02
5	19.5	4.21	4.63	4.29	407.03
6	18.1	4.01	4.52	2.32	412.36
7	15.46	3.79	4.08	3.06	415.79
8	16.34	3.63	4.5	2.1	416.82
9	15.1	3.46	4.37	2.02	417.81
10	10.95	3.37	3.25	2.79	417.32
11	6.94	3.23	2.14	3.0	416.12
12	6.73	3.15	2.14	2.91	413.93
13	4.68	3.3	1.42	4.83	410.7
14	1.46	3.51	0.42	6.99	405.59
15	0.44	3.64	0.12	10.0	397.97
16	-5.45	4.11	-1.32	45.94	389.0
17	-13.0	4.93	-2.64	92.79	375.92
18	-25.27	6.24	-4.05	176.49	352.44
19	-49.45	8.35	-5.92	345.2	310.49
20	-120.17	15.08	-7.97	838.87	178.85
top - bottom	147.13	17.8	8.27	12.8	nan
long - short	82.85	11.24	7.37	6.1	nan



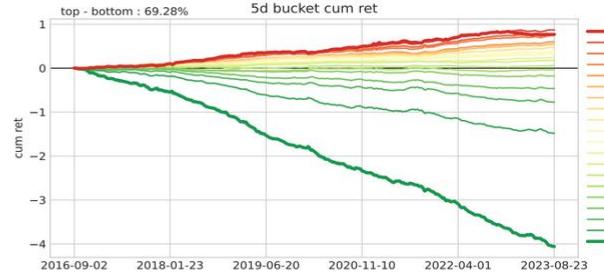
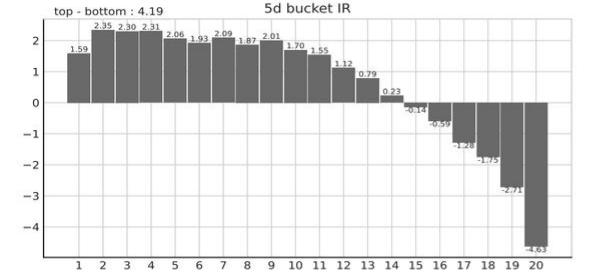
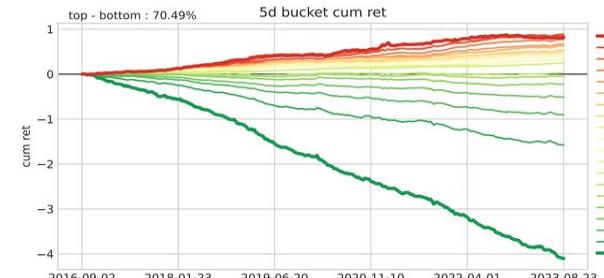
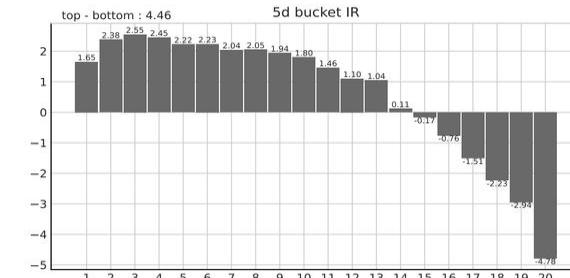
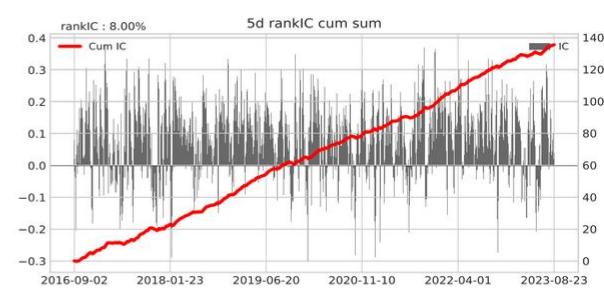
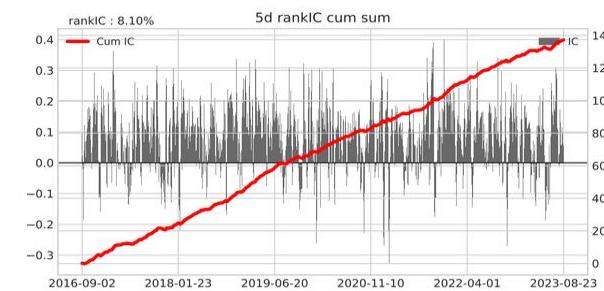
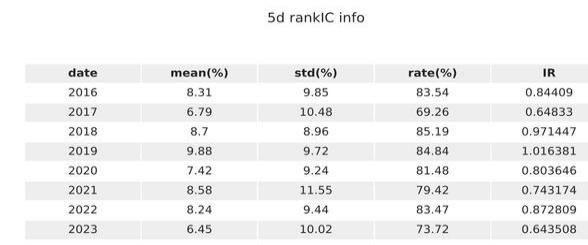
Pred10 window40 hidden128 IC

03

多任务低频量价模型—多频率合并更优



只用日频数据训练的GRU



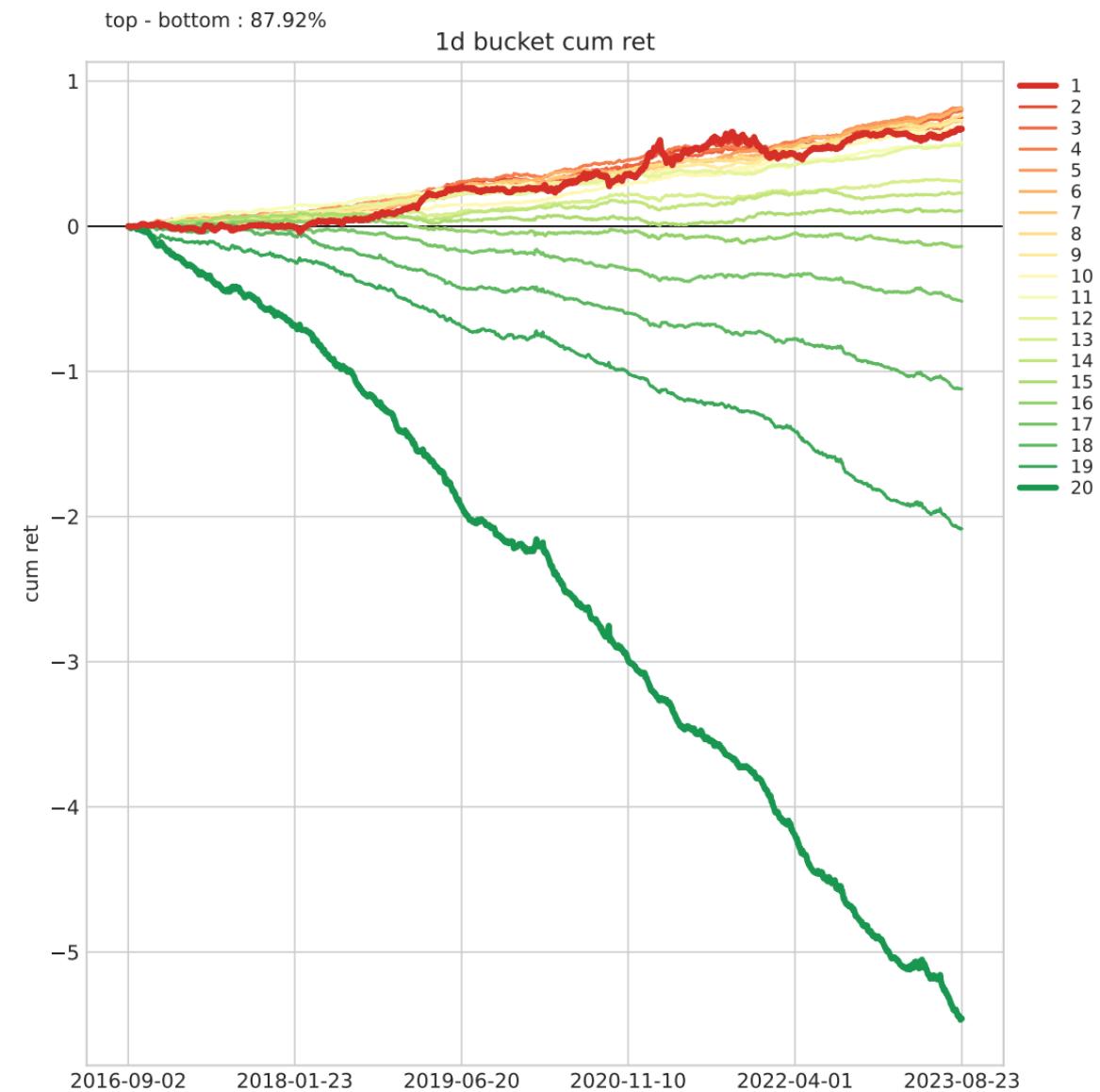
多任务低频量价模型日频+周频

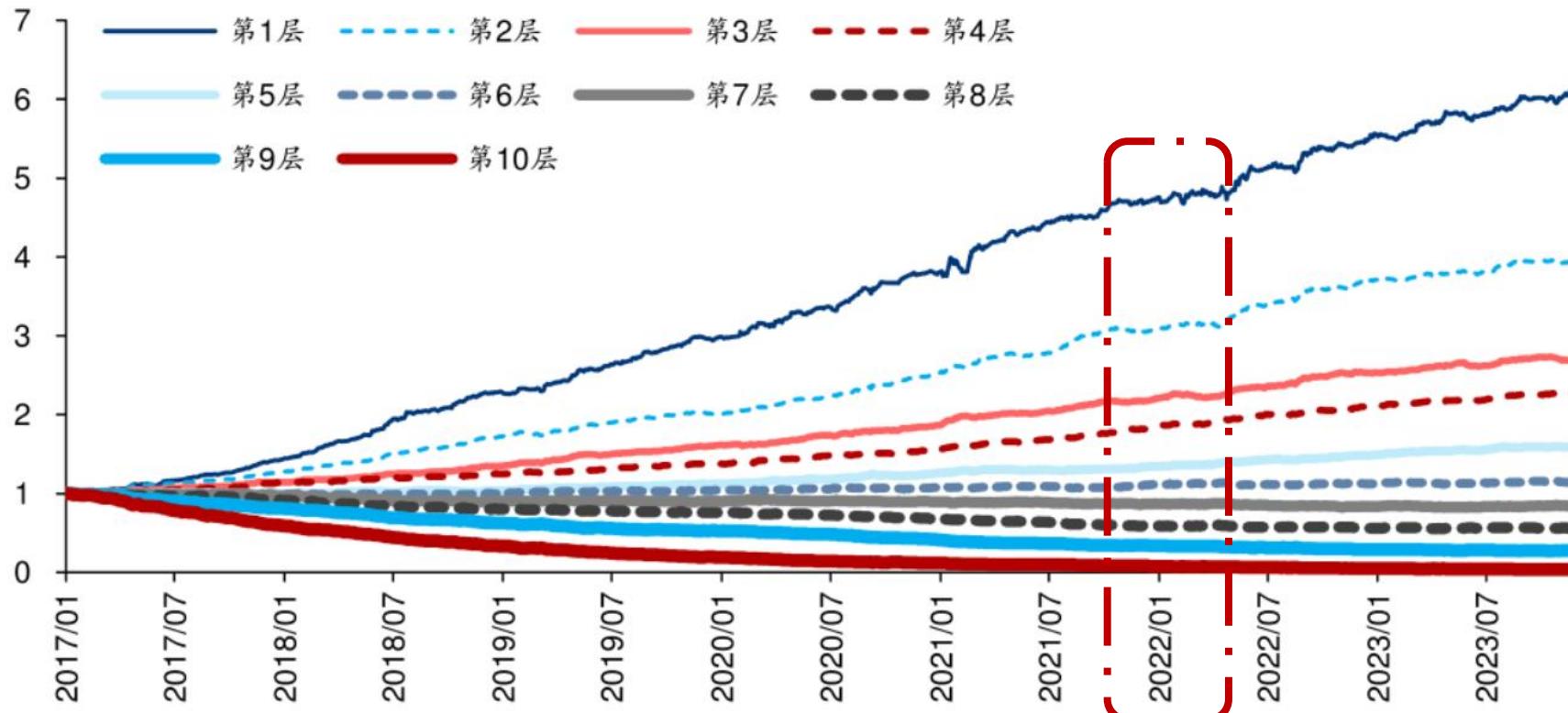
多任务低频量价模型日频+周频+月频

03

多任务低频量价模型一月频

1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	9.62	9.67	0.99	19.05	116.01
2	10.73	6.11	1.76	8.15	241.59
3	11.43	4.67	2.45	4.05	297.87
4	11.66	4.04	2.88	3.85	329.14
5	11.6	3.84	3.02	3.62	348.1
6	11.61	3.67	3.16	2.9	359.73
7	10.44	3.56	2.93	2.82	368.06
8	10.95	3.51	3.12	2.56	371.86
9	10.45	3.55	2.94	3.62	374.58
10	9.87	3.32	2.97	1.61	374.85
11	8.24	3.63	2.27	5.48	373.93
12	8.05	3.31	2.43	3.38	371.73
13	4.52	3.38	1.34	5.16	367.61
14	3.26	3.45	0.94	6.88	360.97
15	1.53	3.5	0.44	9.01	351.79
16	-1.99	4.09	-0.49	19.81	338.86
17	-7.41	4.61	-1.61	54.05	321.01
18	-16.08	5.69	-2.83	113.29	294.38
19	-29.89	7.59	-3.94	209.52	247.56
20	-78.3	12.69	-6.17	547.02	126.81
top - bottom	87.92	17.19	5.11	16.43	nan
long - short	49.52	10.47	4.73	8.16	nan



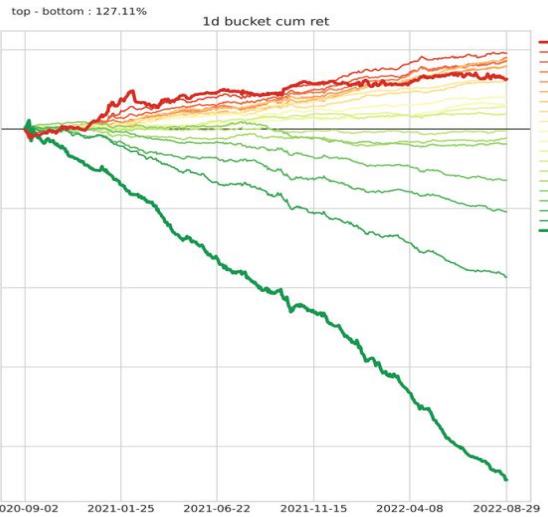


03

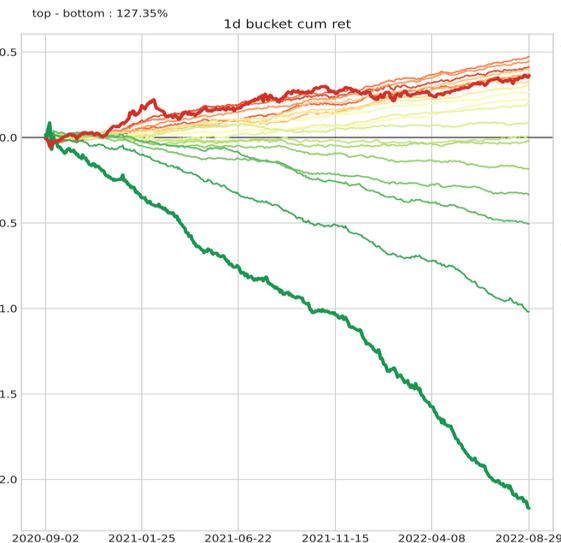
多任务低频量价模型—模型

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	15.89	11.65	1.36	10.74	214.65
2	24.08	7.38	3.26	2.8	345.44
3	21.55	5.84	3.69	2.0	384.11
4	22.57	5.3	4.26	2.81	401.35
5	19.96	4.9	4.07	2.41	411.97
6	19.96	4.52	4.42	1.82	417.74
7	22.15	4.23	5.23	1.68	419.73
8	15.6	4.11	3.79	2.26	422.52
9	16.87	3.83	4.4	1.48	424.11
10	10.43	3.78	2.76	2.32	423.52
11	7.71	3.65	2.11	3.13	421.28
12	7.19	3.8	1.89	2.62	419.45
13	5.0	3.81	1.31	3.7	416.06
14	-0.48	4.06	-0.12	4.76	410.28
15	-2.78	4.29	-0.65	10.99	403.01
16	-4.79	4.81	-1.0	16.09	391.97
17	-16.18	5.5	-2.94	34.12	378.53
18	-26.21	7.14	-3.67	54.11	353.94
19	-46.94	9.75	-4.82	97.93	308.9
20	-111.23	17.15	-6.49	226.8	185.65
top - bottom	127.11	23.11	5.5	11.64	nan
long - short	79.9	13.88	5.76	5.47	nan



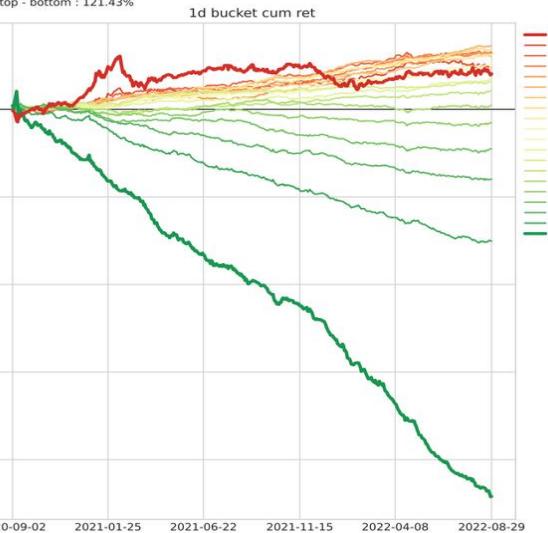
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	18.25	12.19	1.5	11.77	226.63
2	20.77	6.4	3.24	3.54	358.7
3	18.28	4.76	3.84	3.08	395.36
4	23.79	4.34	5.48	1.93	412.04
5	22.45	4.04	5.56	1.64	421.29
6	18.69	4.01	4.66	1.36	427.27
7	19.89	4.0	4.97	2.28	429.65
8	16.36	3.93	4.16	1.3	432.5
9	15.32	3.88	3.95	1.34	433.58
10	11.33	3.83	2.96	2.31	433.29
11	13.33	3.82	3.49	2.7	433.29
12	10.04	3.72	2.7	2.94	431.99
13	4.38	3.79	1.16	4.86	430.91
14	0.35	3.69	0.1	6.18	425.99
15	-1.08	3.76	-0.29	7.14	421.54
16	-9.29	3.96	-2.34	21.08	415.48
17	-16.85	4.3	-3.92	35.74	404.77
18	-25.39	5.88	-4.32	54.8	388.27
19	-51.22	9.09	-5.64	108.54	352.9
20	-109.1	17.35	-6.29	225.51	221.66
top - bottom	127.35	22.41	5.68	13.34	nan
long - short	80.44	12.5	6.44	7.69	nan



SharedGRU

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	10.24	14.82	0.69	19.17	189.41
2	11.93	7.42	1.61	5.02	333.45
3	16.34	5.39	3.03	3.3	376.29
4	16.09	4.46	3.6	2.21	395.61
5	16.05	4.61	3.48	2.01	407.11
6	18.3	4.16	4.4	1.38	413.51
7	15.2	4.1	3.71	1.37	417.88
8	16.98	4.21	4.03	1.72	420.43
9	15.7	3.89	4.03	1.8	421.32
10	13.12	3.93	3.33	1.65	420.54
11	11.81	4.04	2.93	2.09	419.56
12	8.57	3.9	2.2	2.7	416.58
13	7.89	3.86	2.04	1.62	414.25
14	5.33	3.81	1.4	4.8	409.02
15	1.14	3.99	0.28	7.59	401.55
16	-3.94	4.26	-0.92	12.94	391.37
17	-11.3	4.92	-2.3	27.53	380.13
18	-20.12	6.07	-3.31	44.85	359.27
19	-37.83	8.48	-4.46	81.53	325.85
20	-111.2	16.67	-6.67	231.56	209.17
top - bottom	121.43	23.53	5.16	15.72	nan
long - short	70.67	12.58	5.62	8.73	nan

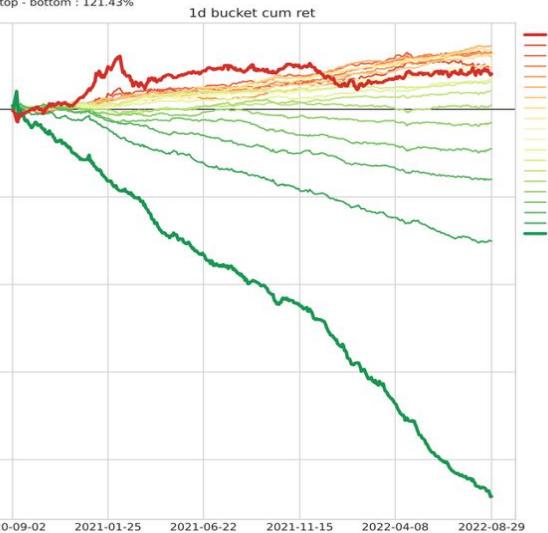


bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	21.92	11.8	1.86	11.16	281.27
2	16.12	6.79	2.38	4.12	392.19
3	26.18	5.39	4.86	1.96	419.04
4	21.34	4.45	4.8	1.93	429.29
5	23.42	4.13	5.68	2.16	434.94
6	21.72	4.09	5.31	2.24	439.63
7	18.31	4.0	4.58	2.26	441.62
8	13.35	3.91	3.41	2.09	443.54
9	9.23	4.01	2.3	2.43	444.73
10	10.83	4.04	2.68	1.78	445.92
11	6.49	3.76	1.73	2.48	444.08
12	6.57	3.74	1.76	2.63	443.61
13	1.33	3.87	0.34	4.39	443.25
14	0.26	3.86	0.07	5.52	441.25
15	-4.0	3.98	-1.01	13.3	437.01
16	-12.47	4.05	-3.08	25.71	430.29
17	-10.74	4.41	-2.43	23.7	420.95
18	-27.26	5.57	-4.9	56.45	408.57
19	-40.4	7.91	-5.11	85.99	378.51
20	-101.9	16.81	-6.06	213.02	257.51
top - bottom	123.83	21.23	5.83	15.38	nan
long - short	78.07	12.39	6.3	8.51	nan

IndependentGRU

1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	10.24	14.82	0.69	19.17	189.41
2	11.93	7.42	1.61	5.02	333.45
3	16.34	5.39	3.03	3.3	376.29
4	16.09	4.46	3.6	2.21	395.61
5	16.05	4.61	3.48	2.01	407.11
6	18.3	4.16	4.4	1.38	413.51
7	15.2	4.1	3.71	1.37	417.88
8	16.98	4.21	4.03	1.72	420.43
9	15.7	3.89	4.03	1.8	421.32
10	13.12	3.93	3.33	1.65	420.54
11	11.81	4.04	2.93	2.09	419.56
12	8.57	3.9	2.2	2.7	416.58
13	7.89	3.86	2.04	1.62	414.25
14	5.33	3.81	1.4	4.8	409.02
15	1.14	3.99	0.28	7.59	401.55
16	-3.94	4.26	-0.92	12.94	391.37
17	-11.3	4.92	-2.3	27.53	380.13
18	-20.12	6.07	-3.31	44.85	359.27
19	-37.83	8.48	-4.46	81.53	325.85
20	-111.2	16.67	-6.67	231.56	209.17
top - bottom	121.43	23.53	5.16	15.72	nan
long - short	70.67	12.58	5.62	8.73	nan



bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	21.92	11.8	1.86	11.16	281.27
2	16.12	6.79	2.38	4.12	392.19
3	26.18	5.39	4.86	1.96	419.04
4	21.34	4.45	4.8	1.93	429.29
5	23.42	4.13	5.68	2.16	434.94
6	21.72	4.09	5.31	2.24	439.63
7	18.31	4.0	4.58	2.26	441.62
8	13.35	3.91	3.41	2.09	443.54
9	9.23	4.01	2.3	2.43	444.73
10	10.83	4.04	2.68	1.78	445.92
11	6.49	3.76	1.73	2.48	444.08
12	6.57	3.74	1.76	2.63	443.61
13	1.33	3.87	0.34	4.39	443.25
14	0.26	3.86	0.07	5.52	441.25
15	-4.0	3.98	-1.01	13.3	437.01
16	-12.47	4.05	-3.08	25.71	430.29
17	-10.74	4.41	-2.43	23.7	420.95
18	-27.26	5.57	-4.9	56.45	408.57
19	-40.4	7.91	-5.11	85.99	378.51
20	-101.9	16.81	-6.06	213.02	257.51
top - bottom	123.83	21.23	5.83	15.38	nan
long - short	78.07	12.39	6.3	8.51	nan

SharedCrossGRU

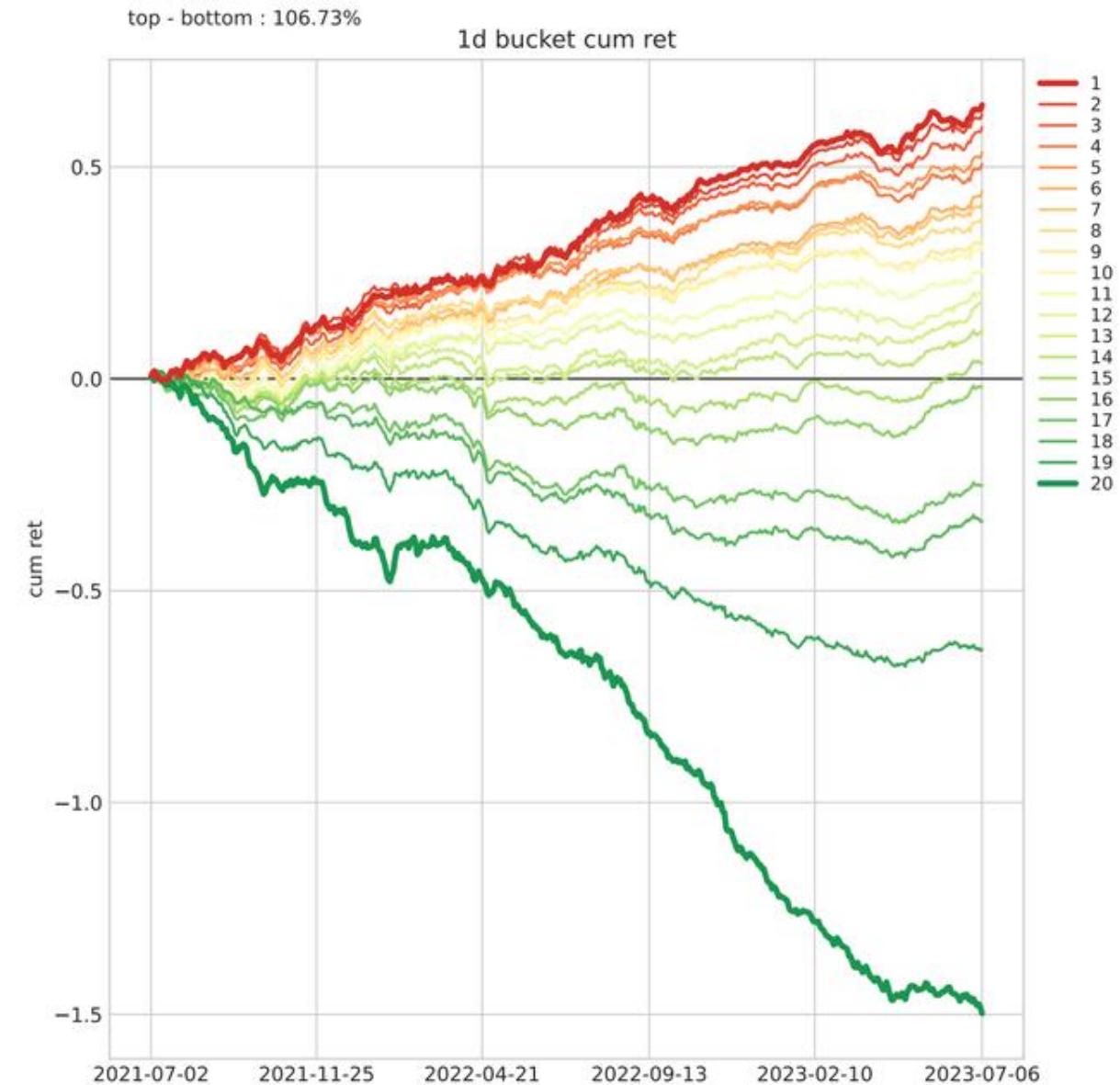
1d bucket info

bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	10.24	14.82	0.69	19.17	189.41
2	11.93	7.42	1.61	5.02	333.45
3	16.34	5.39	3.03	3.3	376.29
4	16.09	4.46	3.6	2.21	395.61

标签预测日 (2020-09--2022-09)													
	3		5		7		10		15		20		
	Merge	day	Merge	day	Merge	day	<u>Merge</u>	day	Merge	day	Merge	day	
1d ret	8.0	4.8	8.19	6.04	6.95	5.13	<u>15.89</u>	3.72	17.13	1.75	16.01	2.01	
1d IC	4.99	5.06	4.37	4.80	4.48	4.91	<u>5.25</u>	4.86	4.79	4.20	4.69	4.41	
5d IC	5.52	5.06	5.19	4.92	5.40	5.45	<u>7.07</u>	5.91	5.99	5.20	5.50	5.83	
10d IC	5.60	5.00	5.63	5.17	5.81	5.69	<u>7.70</u>	6.16	6.26	5.21	6.01	5.99	

03 / 多任务低频量价模型—频率(5m)

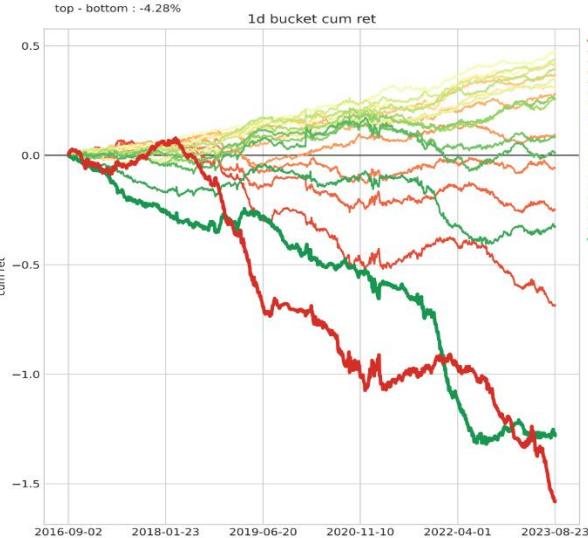
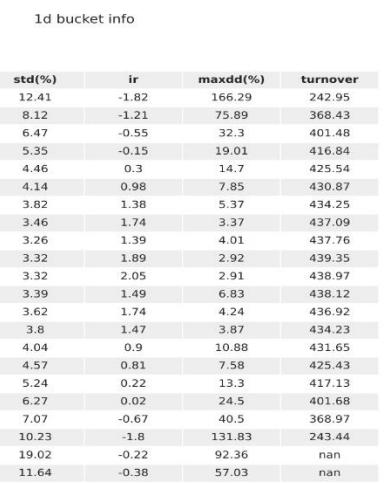
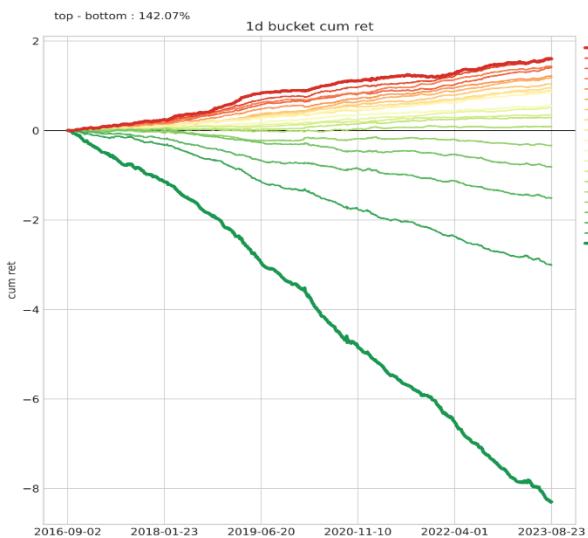
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	32.17	9.22	3.49	4.83	341.1
2	31.08	8.93	3.48	5.25	409.46
3	29.54	8.83	3.35	5.4	426.09
4	25.25	8.4	3.0	6.13	434.01
5	26.59	8.48	3.14	5.37	438.37
6	22.04	8.3	2.66	5.25	441.35
7	20.6	8.28	2.49	4.74	441.47
8	18.99	8.55	2.22	5.43	442.43
9	16.42	8.06	2.04	4.96	442.19
10	15.57	8.27	1.88	5.0	440.08
11	12.82	8.3	1.54	5.73	437.85
12	10.35	8.12	1.28	7.27	435.8
13	9.05	8.05	1.12	7.49	437.38
14	5.69	8.0	0.71	6.98	441.71
15	1.83	8.0	0.23	11.18	439.51
16	-0.98	8.46	-0.12	17.04	435.09
17	-12.51	8.84	-1.42	34.92	427.87
18	-16.75	9.19	-1.82	44.05	412.86
19	-31.79	10.15	-3.13	69.62	385.02
20	-74.57	13.45	-5.54	150.44	287.08
top - bottom	106.73	14.13	7.55	9.33	nan
long - short	60.56	9.46	6.4	4.48	nan



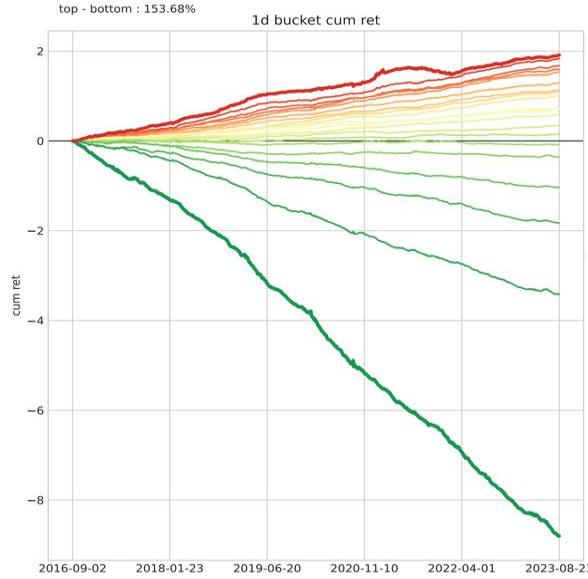
03

多任务低频量价模型—损失函数

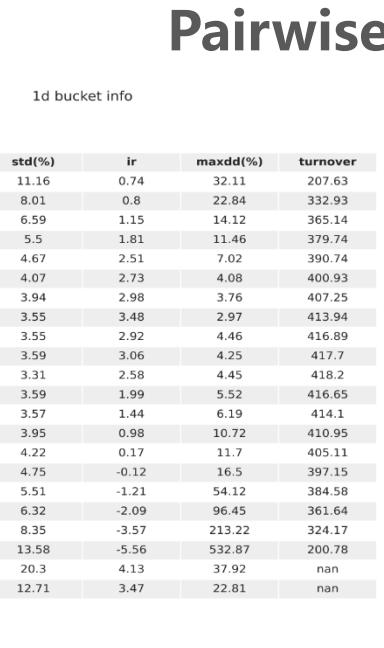
1d bucket info					
bucket	ret(%)	std(%)	ir	maxdd(%)	turnover
1	23.02	6.38	3.61	6.44	224.48
2	22.76	5.18	4.39	3.73	345.58
3	20.17	4.76	4.24	3.66	380.68
4	20.66	4.57	4.52	2.8	396.7
5	17.47	4.3	4.06	4.07	405.99
6	16.89	4.04	4.18	2.85	411.21
7	14.95	3.79	3.94	2.24	414.43
8	13.67	3.65	3.74	2.32	415.62
9	12.84	3.5	3.67	2.9	415.24
10	12.45	3.33	3.73	2.49	414.27
11	8.0	3.16	2.53	2.52	413.21
12	7.36	3.22	2.29	4.75	409.95
13	4.94	3.23	1.53	2.52	406.5
14	4.18	3.5	1.19	3.44	401.13
15	1.23	3.81	0.32	9.04	393.16
16	-4.74	4.37	-1.08	35.34	382.97
17	-11.69	5.26	-2.22	84.4	368.6
18	-21.6	6.36	-3.4	151.32	344.09
19	-43.05	8.59	-5.01	300.71	301.46
20	-119.05	15.68	-7.59	831.57	169.26
top - bottom	142.07	18.97	7.49	10.88	nan
long - short	77.17	11.86	6.51	5.89	nan



MSE-IC



CorrelationIC



HuberLoss

感谢聆听

汇报人：王麟 时间：2025.07.18

