国泰君安191因子回测-111-120

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April 23, 2020

1 Alpha111

$$Alpha = SMA(VOL * ((CLOSE - LOW) - (HIGH - CLOSE))/(HIGH - LOW), 11, 2) -$$
$$SMA(VOL * ((CLOSE - LOW) - (HIGH - CLOSE))/(HIGH - LOW), 4, 2) \tag{1}$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	10.0	-10.0	4.25	21.95	72.24	3.64(0.23)	9.77	0.66	12.15	2.01	944 X 870	11.01	14.01	32.89	0.0161
20110101-20111231	10.0	-10.0	3.12	15.97	74.35	4.05(0.256)	5.07	0.64	8.59	1.88	1102 X 1043	-28.61	-39.34	60.54	0.013
20120101-20121231	10.0	-10.0	2.43	12.49	73.13	3.29(0.208)	3.61	0.62	6.83	1.36	1229 X 1145	5.89	3.25	19.1	0.0121
20130101-20131231	10.0	-9.98	3.25	17.03	72.23	3.37(0.213)	8.83	0.64	9.46	1.63	1258 X 1189	25.4	19.03	8.74	0.0133
20140101-20141231	10.0	-9.99	2.37	12.11	75.8	2.15(0.136)	16.45	0.59	6.39	0.86	1336 X 1175	63.52	35.54	-39.32	0.0117
20150101-20151231	9.98	-10.0	3.37	17.51	67.62	1.8(0.114)	28.27	0.6	10.22	0.92	1419 X 1285	52.17	46.78	-17.53	0.0088
20160101-20161231	9.99	-9.98	3.39	17.38	72.97	4.27(0.27)	5.77	0.65	9.54	2.08	1482 X 1383	-5.9	-15.42	40.71	0.0159
20170101-20171231	9.98	-9.98	3.89	19.93	76.1	4.81(0.304)	3.26	0.65	10.49	2.46	1669 X 1580	-4.3	0.88	44.21	0.0154
20180101-20181231	9.99	-9.99	4.39	22.59	73.21	6.01(0.38)	2.84	0.67	12.35	3.34	1773 X 1739	-39.06	-38.75	84.24	0.0139
20190101-20191231	9.99	-9.98	2.69	13.82	77.06	2.88(0.182)	8.77	0.59	7.16	1.22	1860 X 1756	5.23	26.71	22.36	0.0093
20200101-20200331	9.99	-9.99	0.72	15.62	77.36	3.04(0.192)	4.27	0.57	8.08	1.37	1821 X 1867	-37.58	-12.47	68.79	0.0095
20100104-20200331	9.99	-9.99	33.86	17.04	73.57	3.17(0.2)	32.85	0.63	9.26	1.52	1418 X 1330	7.46	4.85	26.59	0.0129

Figure 1: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.6564	5.25	7.0	4.29	3.56	175	211919_my_182
0.6279	5.35	4.35	2.71	2.61	175	211919_my_200
0.5608	2.38	2.39	1.11	1.11	175	211930_h_ori130

Figure 2: 相关性结果

2 Alpha112

$$Alpha = (SUM((CLOSE - DELAY(CLOSE, 1) > 0?CLOSE - DELAY(CLOSE, 1) : 0), 12) -$$
$$SUM((CLOSE - DELAY(CLOSE, 1) < 0?ABS(CLOSE - DELAY(CLOSE, 1)) : 0), 12))/$$
$$(SUM((CLOSE - DELAY(CLOSE, 1) > 0?CLOSE - DELAY(CLOSE, 1) : 0), 12) +$$
$$SUM((CLOSE - DELAY(CLOSE, 1) < 0?ABS(CLOSE - DELAY(CLOSE, 1)) : 0), 12)) * 100 \tag{2}$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	9.99	-10.0	-3.66	-18.92	45.65	-3.6(-0.228)	38.93	0.4	-16.58	-2.32	850 X 928	-11.99	14.01	-25.84	-0.0332
20110101-20111231	10.0	-10.0	-2.02	-10.34	42.56	-2.54(-0.161)	25.83	0.46	-9.72	-1.25	985 X 1116	-50.04	-39.34	29.36	-0.0207
20120101-20121231	9.98	-10.0	-3.05	-15.72	43.32	-4.1(-0.259)	33.35	0.35	-14.5	-2.47	1121 X 1215	-17.06	3.25	-14.36	-0.0327
20130101-20131231	9.96	-10.0	-2.84	-14.93	44.28	-3.73(-0.236)	29.34	0.37	-13.49	-2.16	1156 X 1234	4.45	19.03	-34.22	-0.0251
20140101-20141231	9.92	-10.0	-2.09	-10.72	44.99	-2.79(-0.176)	29.75	0.4	-9.52	-1.36	1165 X 1208	20.13	35.54	-41.28	-0.0197
20150101-20151231	7.57	-7.8	-6.02	-16.34	44.07	-0.96(-0.061)	79.48	0.28	-36.39	-0.59	927 X 980	46.96	50.27	-124.5	-0.0303
20160101-20161231	5.92	-5.98	-2.35	-122.71	43.14	-1.39(-0.088)	44.01	0.21	-18.73	-2.35	794 X 845	-64.7	-20.06	23.86	-0.0175
20170101-20171231	6.57	-6.6	-0.11	8.14	39.94	0.2(0.013)	8.45	0.3	-0.85	0.09	980 X 1069	-46.17	-12.91	44.28	-0.005
20180101-20181231	5.14	-5.13	-1.69	-12.33	43.6	-1.59(-0.1)	33.08	0.2	-15.55	-0.85	871 X 889	-44.86	-16.51	11.01	-0.0145
20190101-20191231	9.97	-10.0	-3.59	-18.44	44.34	-5.62(-0.356)	36.04	0.36	-16.63	-3.63	1758 X 1852	-2.73	26.71	-34.09	-0.0277
20200101-20200331	9.96	-10.0	-0.55	-11.92	43.52	-1.98(-0.125)	13.01	0.43	-10.98	-1.03	1755 X 1928	-30.07	-12.47	6.1	-0.0186
20100104-20200331	8.53	-8.58	-27.97	-22.99	43.73	-0.74(-0.047)	330.02	0.34	-15.01	-0.53	1077 X 1152	-13.83	5.55	-18.98	-0.0225

Figure 3: 回测结果

```
| -0.7001 | 3.5   | 5.53  | 3.85  | 2.22 | 101  | 214808_pv_model_1_mod_gen2_191114_172|
| -0.7204 | 2.61  | 4.41  | 4.35  | 1.11 | 99   | 214982_pv_model_9_mod_gen6_191114_217|
| -0.7501 | 3.41  | 6.33  | 4.76  | 2.66 | 175  | 211919_my_94                         |
```

Figure 4: 相关性结果

3 Alpha113

$$Alpha = (-1 * ((RANK((SUM(DELAY(CLOSE, 5), 20)/20)) * CORR(CLOSE, VOLUME, 2))$$

$$* RANK(CORR(SUM(CLOSE, 5), SUM(CLOSE, 20), 2)))) \tag{3}$$

```
dates              long(M) short(M) pnl(M) %ret     %tvr    shrp (IR)      %dd    %win  bpmrgn fitness Coverage     %posret %inxret %negret IC
20100104-20101231 0.37    -0.37    0.05   663.99   186.78  0.63(0.04)     19.18  0.02  1.36   1.19    10 X 11      87.97   -5.97   -75.39  0.0002
20110101-20111231 0.45    -0.45    0.3    83.28    186.65  0.34(0.022)    9.5    0.04  7.23   0.23    9 X 9        35.37   -0.28   32.1    0.0052
20120101-20121231 0.91    -0.9     0.5    389.37   193.42  0.72(0.045)    14.64  0.07  5.86   1.02    20 X 16      83.46   3.58    -26.78  0.0039
20130101-20131231 0.75    -0.76    1.55   21.17    183.63  1.68(0.106)    4.54   0.06  23.43  0.57    10 X 9       276.37  0.47    -60.86  0.013
20140101-20141231 1.8     -1.8     0.66   3.36     137.54  0.53(0.034)    37.09  0.11  5.44   0.08    3 X 3        56.58   5.03    -19.21  0.018
20150101-20151231 0.7     -0.71    1.1    1600.33  188.65  1.8(0.114)     23.0   0.08  16.93  5.23    66 X 63      579.92  25.45   -416.82 0.0108
20160101-20161231 1.68    -1.68    1.11   -1162.44 151.55  -0.65(-0.041)  87.78  0.1   8.91   -1.79   38 X 35      95.23   2.86    -27.72  -0.0071
20170101-20171231 3.36    -3.36    2.57   13.18    140.15  1.44(0.091)    38.59  0.2   11.19  0.44    3 X 2        14.35   -1.58   64.06   0.0386
20180101-20181231 2.51    -2.51    2.95   140.34   150.08  1.14(0.072)    28.16  0.16  16.12  1.1     15 X 14      -49.09  -27.94  170.18  0.0266
20190101-20191231 4.48    -4.51    0.78   21.04    141.09  0.25(0.016)    44.78  0.26  2.53   0.1     20 X 18      -45.94  0.43    63.4    -0.0076
20200101-20200331 3.09    -2.93    -1.46  -263.81  167.26  -3.89(-0.246)  80.63  0.17  -25.0  -4.89   38 X 34      -144.24 -23.37  -62.72  -0.0246

20100104-20200331 1.74    -1.74    10.09  166.93   152.3   0.23(0.014)    199.62 0.11  7.67   0.24    20 X 18      34.4    -0.33   23.98   0.0094
```

Figure 5: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.154	4.1	8.73	2.97	1.66	100	214874_pv_model_7_mod_gen2_191114_52
0.1494	2.35	4.98	4.1	1.12	100	214812_pv_model_2_mod_gen4_191114_4
0.149	3.84	8.01	3.0	1.51	101	214801_pv_model_1_gen4_191114_127

Figure 6: 相关性结果

4 Alpha114

$$Alpha = ((RANK(DELAY(((HIGH - LOW)/(SUM(CLOSE, 5)/5)), 2)) *$$

$$RANK(RANK(VOLUME)))/(((HIGH - LOW)/(SUM(CLOSE, 5)/5))/(VWAP - CLOSE))) \tag{4}$$

```
dates              long(M) short(M) pnl(M) %ret    %tvr    shrp (IR)      %dd   %win  bpmrgn fitness Coverage      %posret %inxret %negret IC
20100104-20101231 10.0    -10.0    8.19   42.31   148.06  10.79(0.682)   1.57  0.79  11.43  5.77    927 X 823     47.04   14.01   37.56   0.0474
20110101-20111231 10.0    -10.0    5.71   29.26   146.39  9.54(0.603)    1.52  0.74  8.0    4.26    1043 X 1023   -10.14  -39.34  68.66   0.0353
20120101-20121231 10.0    -10.0    6.13   31.56   146.96  11.66(0.738)   1.74  0.77  8.59   5.4     1176 X 1127   32.07   3.25    31.04   0.0352
20130101-20131231 10.0    -10.0    9.98   52.43   146.71  12.17(0.77)    1.67  0.82  14.29  7.28    1211 X 1141   64.21   19.03   40.63   0.0468
20140101-20141231 10.0    -10.0    7.45   38.0    148.2   12.33(0.78)    1.77  0.83  10.26  6.24    1221 X 1086   70.66   35.54   5.35    0.0397
20150101-20151231 10.0    -10.02   12.9   66.06   143.74  10.71(0.678)   2.95  0.81  18.37  7.26    1206 X 1083   105.34  46.78   26.73   0.0465
20160101-20161231 10.0    -10.0    7.45   38.19   149.2   9.22(0.583)    2.0   0.73  10.24  4.67    1330 X 1277   5.22    -15.42  71.17   0.0447
20170101-20171231 10.0    -10.0    7.19   36.81   147.1   10.41(0.658)   1.74  0.8   10.01  5.21    1533 X 1488   16.56   0.88    57.06   0.041
20180101-20181231 10.0    -10.01   5.21   26.78   147.75  6.45(0.408)    2.38  0.65  7.25   2.75    1682 X 1661   -20.68  -38.75  74.24   0.0218
20190101-20191231 10.01   -10.0    4.07   20.85   146.28  5.38(0.34)     2.17  0.64  5.7    2.03    1812 X 1780   31.38   26.71   10.28   0.0174
20200101-20200331 10.02   -9.98    1.39   30.07   149.48  5.35(0.339)    2.65  0.66  8.04   2.4     1918 X 1715   7.01    -12.47  53.17   0.0205

20100104-20200331 10.0    -10.0    75.68  38.01   147.1   9.22(0.583)    2.95  0.76  10.33  4.69    1329 X 1260   33.49   4.85    42.51   0.0372
```

Figure 7: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.9267	9.95	5.19	2.86	5.21	175	211930_h_ori104
0.7406	5.35	4.35	2.71	2.61	175	211919_my_200
0.7216	8.06	6.05	4.81	3.89	175	211919_my_241

Figure 8: 相关性结果

5 Alpha115

$$Alpha = (RANK(CORR(((HIGH * 0.9) + (CLOSE * 0.1)),$$

$$MEAN(VOLUME, 30), 10)) ** RANK(CORR(TSRANK(((HIGH + LOW)/2), 4), TSRANK(VOLUME, 10), 7))) \quad (5)$$

```
dates             long(M) short(M) pnl(M)  %ret    %tvr    shrp (IR)      %dd    %win   bpmrgn fitness Coverage      %posret %inxret %negret IC
20100104-20101231 10.0    -10.0    0.29    1.49    50.95   0.67(0.042)    7.31   0.55   1.17   0.11    536 X 402     14.36   14.01   -11.38  0.0024
20110101-20111231 10.0    -10.0    0.69    3.52    49.27   1.74(0.11)     3.75   0.52   2.86   0.46    653 X 488     -31.26  -39.34  38.3    0.0063
20120101-20121231 10.0    -10.0    0.36    1.85    49.45   1.1(0.07)      2.83   0.53   1.5    0.21    906 X 671     8.55    3.25    -4.85   0.0027
20130101-20131231 10.0    -10.0    0.04    0.19    46.67   0.12(0.008)    2.7    0.52   0.17   0.01    1228 X 913    23.82   19.03   -23.43  0.0007
20140101-20141231 10.0    -10.0    0.59    3.01    47.94   1.79(0.113)    2.79   0.52   2.51   0.45    1154 X 860    39.71   35.54   -33.7   0.0043
20150101-20151231 10.0    -10.01   0.85    4.34    47.8    1.02(0.065)    10.03  0.46   3.64   0.31    1019 X 758    80.7    46.78   -71.92  0.0033
20160101-20161231 10.0    -10.0    0.24    1.21    47.14   0.72(0.045)    4.88   0.48   1.03   0.12    1306 X 973    -8.88   -15.42  11.3    0.0012
20170101-20171231 10.0    -10.0    0.6     3.08    46.46   1.78(0.112)    3.19   0.56   2.65   0.46    1553 X 1165   -12.93  0.88    19.1    0.0058
20180101-20181231 10.0    -10.0    -0.07   -0.36   47.68   -0.22(-0.014)  4.0    0.49   -0.3   -0.02   1780 X 1338   -33.86  -38.75  33.14   -0.0013
20190101-20191231 10.0    -10.0    -0.37   -1.91   46.19   -1.09(-0.069)  6.45   0.41   -1.66  -0.22   1987 X 1492   23.44   26.71   -27.25  -0.0034
20200101-20200331 9.99    -10.02   0.05    1.14    50.24   0.61(0.038)    2.17   0.47   0.91   0.09    2032 X 1553   -9.7    -12.47  11.95   -0.001

20100104-20200331 10.0    -10.0    3.26    1.64    48.01   0.76(0.048)    10.02  0.51   1.36   0.14    1232 X 921    9.89    4.85    -6.62   0.0021
```

Figure 9: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.3664	5.55	2.33	-2.25	2.93	146	213024_agen.ZSAlpha_38
0.3651	2.85	2.2	-0.97	1.78	175	211919_my_58
0.3279	3.4	1.89	-0.29	1.34	100	214865_fac225

Figure 10: 相关性结果

6 Alpha116

$$Alpha = REGBETA(CLOSE, SEQUENCE, 20) \quad (6)$$

```
dates             long(M) short(M) pnl(M)  %ret    %tvr    shrp (IR)      %dd    %win   bpmrgn fitness Coverage      %posret %inxret %negret IC
20100104-20101231 10.0    -10.0    -2.45   -12.65  17.72   -2.02(-0.128)  31.06  0.47   -28.55 -1.71   859 X 929     -6.18   14.01   -19.12  -0.0024
20110101-20111231 10.0    -10.0    -0.88   -4.53   15.07   -0.86(-0.054)  11.94  0.48   -12.02 -0.47   1161 X 962    -44.33  -39.34  35.28   -0.0014
20120101-20121231 10.0    -10.0    -1.18   -6.08   15.59   -1.06(-0.067)  15.0   0.46   -15.61 -0.66   1232 X 1128   -4.57   3.25    -7.6    -0.0014
20130101-20131231 9.99    -10.0    -2.17   -11.35  15.41   -1.78(-0.113)  21.66  0.4    -29.53 -1.53   1055 X 1391   6.81    19.03   -29.54  -0.0028
20140101-20141231 9.9     -10.01   -1.81   -9.18   16.24   -1.3(-0.082)   31.91  0.44   -22.9  -0.98   1077 X 1428   15.68   35.54   -34.0   -0.0015
20150101-20151231 9.98    -10.01   1.54    7.95    16.0    0.59(0.037)    47.93  0.48   19.75  0.42    1171 X 1525   89.93   46.78   -73.91  0.0001
20160101-20161231 9.99    -10.0    -2.03   -10.41  17.18   -1.61(-0.102)  24.73  0.5    -24.2  -1.25   1329 X 1530   -39.17  -15.42  18.34   -0.0016
20170101-20171231 10.0    -10.0    0.1     0.51    16.27   0.08(0.005)    17.36  0.52   1.3    0.01    1564 X 1666   -30.51  0.88    31.56   -0.0002
20180101-20181231 10.0    -9.99    -0.74   -3.73   16.97   -0.62(-0.039)  16.58  0.48   -9.0   -0.29   1961 X 1546   -52.79  -38.75  45.22   -0.0019
20190101-20191231 9.99    -10.0    -1.42   -7.16   16.27   -0.98(-0.062)  22.94  0.45   -17.84 -0.65   1673 X 1936   13.62   26.71   -28.13  -0.0017
20200101-20200331 9.96    -10.02   -0.29   -6.15   17.06   -0.91(-0.058)  11.12  0.52   -14.53 -0.55   1635 X 2048   -22.25  -12.47  9.77    -0.0022

20100104-20200331 9.98    -10.0    -11.32  -5.66   16.29   -0.77(-0.048)  116.6  0.47   -13.97 -0.45   1316 X 1420   -5.59   4.85    -5.79   -0.0015
```

Figure 11: 回测结果

-0.3819	2.41	4.93	2.86	1.53	100	214819_pv_model_2_mod_gen2_191114_42
-0.394	2.59	5.83	4.89	2.22	146	213024_agen.ZSAlpha_60
-0.4372	3.45	5.5	5.68	2.46	146	213024_agen.ZSAlpha_50

Figure 12: 相关性结果

7 Alpha117

$$Alpha = ((TSRANK(VOLUME, 32) * (1 - TSRANK(((CLOSE + HIGH) - LOW), 16))) * (1 - TSRANK(RET, 32))) \tag{7}$$

```
dates              long(M) short(M) pnl(M) %ret   %tvr   shrp (IR)       %dd   %win bpmrgn fitness Coverage     %posret %inxret %negret IC
20100104-20101231  10.0    -10.0    3.64   18.81  107.85 4.96(0.314)     4.05  0.67 6.98   2.07    602 X 1157   33.74   14.01   3.88    0.0285
20110101-20111231  10.0    -10.0    2.19   11.22  107.65 3.9(0.247)      4.66  0.61 4.17   1.26    701 X 1372   -22.0   -39.34  44.44   0.0182
20120101-20121231  10.0    -9.99    1.08   5.57   106.98 1.85(0.117)     6.53  0.58 2.08   0.42    784 X 1526   10.17   3.25    0.95    0.0126
20130101-20131231  10.0    -9.99    2.99   15.69  106.57 5.61(0.355)     2.32  0.69 5.89   2.15    796 X 1560   46.88   19.03   -15.54  0.0222
20140101-20141231  10.0    -9.96    3.85   19.71  105.62 6.7(0.424)      1.92  0.7  7.46   2.9     777 X 1534   61.2    35.54   -21.93  0.0274
20150101-20151231  9.8     -9.83    2.77   13.63  103.13 1.97(0.125)     17.18 0.58 5.6    0.72    791 X 1515   86.95   46.78   -57.82  0.017
20160101-20161231  9.96    -9.92    0.86   4.42   106.86 1.45(0.092)     4.91  0.58 1.67   0.29    892 X 1719   -9.53   -15.42  18.5    0.0084
20170101-20171231  9.98    -9.93    0.56   2.9    105.13 1.28(0.081)     2.82  0.57 1.1    0.21    1010 X 2017  -17.67  0.88    23.57   0.0059
20180101-20181231  9.92    -9.98    -0.13  -0.65  104.96 -0.23(-0.015)   8.5   0.49 -0.26  -0.02   1136 X 2215  -45.83  -38.75  44.2    0.0025
20190101-20191231  10.0    -9.97    0.29   1.47   104.02 0.58(0.037)     4.54  0.52 0.57   0.07    1205 X 2397  21.07   26.71   -18.19  0.0035
20200101-20200331  10.0    -9.97    -0.31  -6.6   103.91 -1.79(-0.113)   4.73  0.45 -2.55  -0.45   1329 X 2350  -24.34  -12.47  11.13   -0.0052

20100104-20200331  9.97    -9.96    17.79  8.89   105.83 2.49(0.158)     16.89 0.6  3.39   0.72    880 X 1717   15.43   4.85    2.51    0.0141
```

Figure 13: 回测结果

```
+---------+----------+---------+----------+--------+--------+-----------------+
| Corr    | ISSharpe | SemiOS  | OSSharpe |Fitness | OSdays | ID              |
+---------+----------+---------+----------+--------+--------+-----------------+
| 0.6813  | 5.19     | 4.04    | 1.62     | 3.11   | 100    | 214875_pv_model_7_gen4_191114_186|
| 0.6365  | 3.73     | 4.12    | 1.68     | 2.01   | 100    | 214877_pv_model_7_gen6_191114_210|
| 0.6054  | 4.85     | 3.94    | -1.89    | 1.41   | 89     | 215443_fac108   |
```

Figure 14: 相关性结果

8 Alpha118

$$Alpha = SUM(HIGH - OPEN, 20)/SUM(OPEN - LOW, 20) * 100 \tag{8}$$

```
dates              long(M) short(M) pnl(M) %ret   %tvr   shrp (IR)       %dd    %win bpmrgn fitness Coverage     %posret %inxret %negret IC
20100104-20101231  10.0    -10.0    -2.04  -10.56 33.85  -2.07(-0.131)   23.37  0.44 -12.45 -1.15   761 X 1011   1.06    14.01   -22.13  -0.0134
20110101-20111231  10.0    -10.0    -1.29  -6.6   32.4   -1.6(-0.101)    15.72  0.46 -8.15  -0.72   889 X 1207   -39.27  -39.34  26.06   -0.0128
20120101-20121231  10.0    -10.0    -2.48  -12.76 30.49  -4.03(-0.255)   26.34  0.4  -16.7  -2.61   1008 X 1327  -12.47  3.25    -13.0   -0.0212
20130101-20131231  10.0    -10.0    -2.31  -12.15 40.5   -2.93(-0.185)   23.81  0.45 -11.99 -1.6    1026 X 1374  9.93    19.03   -34.2   -0.0135
20140101-20141231  10.0    -10.0    -0.28  -1.41  44.51  -0.27(-0.017)   17.81  0.43 -1.27  -0.05   1018 X 1372  28.1    35.54   -30.93  -0.0088
20150101-20151231  9.9     -9.99    -2.0   -12.23 89.78  -0.71(-0.045)   43.87  0.41 -4.58  -0.26   1103 X 1400  17.84   46.78   -38.13  -0.0112
20160101-20161231  10.0    -10.0    -3.92  -19.34 126.4  -1.36(-0.086)   56.94  0.43 -6.36  -0.53   1297 X 1504  -26.96  -15.42  -13.22  -0.0097
20170101-20171231  9.99    -10.0    -0.82  -4.09  112.73 -0.39(-0.025)   24.24  0.47 -1.48  -0.07   1462 X 1702  -42.72  0.88    34.31   -0.0061
20180101-20181231  10.02   -10.0    -4.84  -21.64 128.67 -1.26(-0.08)    77.55  0.44 -7.73  -0.52   1694 X 1761  -66.54  -38.75  16.88   -0.0079
20190101-20191231  10.14   -10.0    -7.56  -32.63 38.17  -2.83(-0.179)   88.47  0.3  -40.32 -2.62   1609 X 1999  -46.84  26.71   -30.0   -0.0285
20200101-20200331  10.01   -9.99    0.04   0.76   31.57  0.19(0.012)     4.15   0.52 0.98   0.03    1626 X 2055  -5.48   -12.47  7.03    -0.0015

20100104-20200331  10.0    -10.0    -27.49 -13.01 66.95  -1.23(-0.078)   290.64 0.43 -8.25  -0.54   1198 X 1480  -17.63  4.85    -9.98   -0.013
```

Figure 15: 回测结果

```
| -0.1726 | 2.4   | 4.65  | 0.01  | 1.82  | 146   | 213024_agen.ZSAlpha_45|
| -0.1739 | 2.08  | 5.78  | 2.66  | 1.06  | 100   | 214858_pv_model_6_gen6_191114_229|
| -0.1749 | 3.91  | 6.87  | 1.02  | 2.22  | 100   | 214837_pv_model_4_mod_gen4_191114_200|
+---------+-------+-------+-------+-------+-------+-----------------+
```

Figure 16: 相关性结果

9 Alpha119

$$Alpha = RANK(DECAYLINEAR(TSRANK(MIN(CORR(RANK(OPEN), RANK(MEAN(VOLUME, 15)), 21), 9), 7), 8)) -$$
$$RANK(DECAYLINEAR(CORR(VWAP, SUM(MEAN(VOLUME, 5), 26), 5), 7))$$

$$(9)$$

```
dates              long(M) short(M) pnl(M) %ret  %tvr   shrp (IR)      %dd   %win  bpmrgn fitness Coverage      %posret %inxret %negret IC
20100104-20101231  10.0    -10.0    -0.21  -1.08 20.95  -0.78(-0.049)  4.7   0.51  -2.06  -0.18   887 X 860     12.82   14.01   -14.97  -0.0012
20110101-20111231  10.0    -10.0    -0.02  -0.11 20.75  -0.09(-0.006)  3.22  0.5   -0.22  -0.01   1059 X 1027   -32.71  -39.34  32.49   -0.0004
20120101-20121231  10.0    -10.0    0.25   1.27  22.65  1.12(0.071)    1.88  0.5   2.25   0.27    1174 X 1169   8.77    3.25    -6.22   0.002
20130101-20131231  10.0    -10.0    -0.51  -2.66 26.0   -1.85(-0.117)  5.34  0.46  -4.08  -0.59   1213 X 1232   23.17   19.03   -28.48  -0.0038
20140101-20141231  10.0    -10.0    0.11   0.57  24.08  0.36(0.023)    3.95  0.47  0.94   0.05    1247 X 1250   40.74   35.54   -39.6   0.0002
20150101-20151231  10.0    -10.0    -0.41  -2.09 21.46  -0.8(-0.051)   11.04 0.49  -3.89  -0.25   1348 X 1333   73.1    46.78   -77.25  -0.0037
20160101-20161231  10.0    -10.0    -0.16  -0.8  24.14  -0.57(-0.036)  7.27  0.46  -1.33  -0.1    1406 X 1440   -8.81   -15.42  7.21    -0.0019
20170101-20171231  10.0    -10.0    0.13   0.66  24.85  0.52(0.033)    2.89  0.52  1.06   0.08    1576 X 1621   -16.94  0.88    18.26   0.0008
20180101-20181231  10.0    -10.0    0.28   1.42  25.21  1.18(0.075)    2.61  0.55  2.26   0.28    1733 X 1765   -35.53  -38.75  38.37   0.0024
20190101-20191231  10.0    -10.0    0.02   0.13  26.23  0.08(0.005)    4.02  0.43  0.19   0.01    1787 X 1815   25.1    26.71   -24.84  -0.0001
20200101-20200331  10.0    -10.01   -0.04  -0.91 26.14  -0.52(-0.033)  2.07  0.41  -1.39  -0.1    1819 X 1855   -8.05   -12.47  6.22    -0.0025

20100104-20200331  10.0    -10.0    -0.56  -0.28 23.69  -0.18(-0.011)  13.35 0.49  -0.47  -0.02   1355 X 1363   8.57    4.85    -9.12   -0.0006
```

Figure 17: 回测结果

```
  -0.2475 | 5.25  | 7.0   | 4.29  | 3.56  | 175   | 211919_my_182               |
  -0.2698 | 3.78  | 4.91  | 1.88  | 2.42  | 99    | 214969_pv_model_8_mod_gen2_191114_228|
  -0.288  | 5.26  | 6.09  | 5.45  | 2.78  | 98    | 215021_pv_model_10_gen4_191114_130|
+---------+-------+-------+-------+-------+-------+-----------------+
Histogram
```

Figure 18: 相关性结果

10 Alpha120

$$Alpha = (RANK((VWAP - CLOSE))/RANK((VWAP + CLOSE)))$$

$$(10)$$

```
dates              long(M) short(M) pnl(M) %ret  %tvr   shrp (IR)      %dd   %win  bpmrgn fitness Coverage      %posret %inxret %negret IC
20100104-20101231  10.0    -10.0    -0.1   -0.52 28.79  -0.08(-0.005)  13.87 0.47  -0.73  -0.01   479 X 1337    2.01    14.01   -3.06   -0.0022
20110101-20111231  10.0    -10.0    2.54   13.01 29.61  3.25(0.206)    5.78  0.55  17.57  2.16    588 X 1558    -15.04  -39.34  41.06   0.0041
20120101-20121231  10.0    -10.0    2.2    11.35 30.89  2.77(0.175)    4.86  0.55  14.69  1.68    720 X 1654    22.64   3.25    0.04    0.0033
20130101-20131231  10.01   -10.0    -0.5   -2.75 25.88  -0.53(-0.034)  12.48 0.42  -4.08  -0.17   796 X 1651    12.56   19.03   -17.85  -0.0025
20140101-20141231  9.98    -9.97    4.18   21.47 28.66  3.72(0.235)    8.6   0.53  29.82  3.22    861 X 1650    89.18   35.54   -46.51  0.006
20150101-20151231  9.92    -9.92    3.52   18.24 31.24  2.79(0.177)    8.35  0.55  23.25  2.13    866 X 1838    90.89   46.78   -54.56  0.003
20160101-20161231  9.94    -9.94    2.22   11.52 30.86  3.55(0.224)    2.3   0.53  14.82  2.17    925 X 1940    9.4     -15.42  13.47   0.0032
20170101-20171231  9.79    -9.86    1.13   5.85  29.82  1.85(0.117)    6.46  0.52  7.88   0.82    942 X 2307    -0.94   0.88    12.65   0.0014
20180101-20181231  9.99    -9.99    2.19   11.28 29.01  2.93(0.185)    3.4   0.55  15.54  1.83    970 X 2543    -19.2   -38.75  41.73   0.0035
20190101-20191231  9.97    -9.99    -1.65  -8.46 30.0   -1.56(-0.098)  34.79 0.43  -11.3  -0.83   963 X 2654    -1.82   26.71   -15.11  -0.0029
20200101-20200331  9.99    -10.0    -0.1   -2.13 29.08  -0.67(-0.042)  5.12  0.47  -2.93  -0.18   1050 X 2638   -34.3   -12.47  30.02   -0.001

20100104-20200331  9.96    -9.97    15.62  7.9   29.47  1.61(0.102)    34.83 0.51  10.69  0.84    817 X 1931    17.78   4.85    -2.03   0.0016
```

Figure 19: 回测结果

```
+---------+----------+---------+----------+---------+---------+----------------+
| Corr    | ISSharpe | SemiOS  | OSSharpe |Fitness  | OSdays  | ID             |
+---------+----------+---------+----------+---------+---------+----------------+
| 0.996   | 2.88     | 1.37    | -2.29    | 2.0     | 175     | 211919_my_2    |
| 0.6266  | 4.28     | 4.18    | -0.59    | 4.77    | 146     | 213024_agen.ZSAlpha_44|
| 0.5843  | 2.2      | 1.01    | -2.14    | 3.45    | 52      | 213716_Lessgerladminexp2mv|
```

Figure 20: 相关性结果

11 总结

alpha111偏好近期缩量，并且近期的close趋于振幅的下位的股票（即相对来说空方力量强），而且会更专注于小盘股。

alpha114：振幅增量越大越好，成交量越大越好，close略低于vwap最好（慎重）。

alhpa115：分子的变动速度低于分母，因此可以分析出该因子偏好背离股票，看空同向变动股票。