

# 国泰君安191因子回测-101-110

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# 1 Alpha101

$$Alpha = ((RANK(CORR(CLOSE, SUM(MEAN(VOLUME, 30), 37), 15)) - RANK(CORR(RANK(((HIGH * 0.1) + (VWAP * 0.9))), RANK(VOLUME), 11))) * -1) \quad (1)$$

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	-0.48	-2.49	40.59	-0.77(-0.049)	8.94	0.47	-2.45	-0.19	229 X 225	10.28	14.01	-15.24	-0.0058
20110101-20111231	10.0	-10.0	-1.62	-8.27	38.39	-2.77(-0.175)	16.26	0.45	-8.64	-1.29	289 X 278	-41.87	-39.34	25.29	-0.0139
20120101-20121231	10.0	-10.0	-1.9	-9.77	36.01	-3.76(-0.238)	19.02	0.4	-10.85	-1.96	500 X 489	-4.98	3.25	-14.56	-0.0166
20130101-20131231	10.0	-10.0	-0.47	-2.49	33.07	-1.23(-0.078)	8.03	0.46	-3.02	-0.34	994 X 977	20.01	19.03	-25.0	-0.0047
20140101-20141231	10.0	-10.0	-0.56	-2.87	33.75	-1.73(-0.109)	8.77	0.42	-3.4	-0.5	891 X 883	34.19	35.54	-39.93	-0.0038
20150101-20151231	10.0	-10.0	-1.39	-7.14	36.13	-1.55(-0.098)	15.54	0.47	-7.87	-0.69	692 X 676	63.27	46.78	-77.44	-0.0067
20160101-20161231	10.0	-10.0	-1.67	-8.54	33.7	-4.39(-0.277)	17.93	0.39	-10.14	-2.21	994 X 966	-18.26	-15.42	1.18	-0.014
20170101-20171231	10.0	-10.0	-1.68	-8.62	32.5	-5.11(-0.323)	17.17	0.37	-10.61	-2.63	1240 X 1187	-25.57	0.88	8.32	-0.0163
20180101-20181231	10.0	-10.0	-1.44	-7.4	31.46	-3.77(-0.239)	14.42	0.42	-9.41	-1.83	1481 X 1434	-39.98	-38.75	25.17	-0.0115
20190101-20191231	10.0	-9.99	-0.79	-4.07	32.02	-2.29(-0.145)	10.11	0.41	-5.09	-0.82	1711 X 1672	22.02	26.71	-30.19	-0.0074
20200101-20200331	10.01	-9.98	0.08	1.79	35.25	0.79(0.05)	3.22	0.64	2.02	0.18	1787 X 1722	-4.4	-12.47	7.99	0.0034
20100104-20200331	10.0	-10.0	-11.92	-5.99	34.77	-2.3(-0.146)	124.24	0.43	-6.89	-0.96	923 X 899	1.74	4.85	-13.72	-0.0098

Figure 1: 回测结果

-0.5069	3.93	2.44	1.75	1.63	97	215058_fac7
-0.5247	5.95	6.85	3.57	5.6	146	213024_agen.ZSA1pha_46
-0.532	3.24	3.06	0.92	1.8	90	215414_fac132

Figure 2: 相关性结果

# 2 Alpha102

$$Alpha = SMA(MAX(VOLUME - DELAY(VOLUME, 1), 0), 6, 1) / SMA(ABS(VOLUME - DELAY(VOLUME, 1)), 6, 1) * 100 \quad (2)$$

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	-2.17	-11.21	87.75	-2.9(-0.183)	23.49	0.41	-5.11	-1.04	770 X 1044	-9.73	14.01	-12.69	-0.0199
20110101-20111231	10.0	-10.0	-0.77	-3.95	88.86	-1.2(-0.076)	12.99	0.41	-1.78	-0.25	895 X 1250	-44.35	-39.34	36.45	-0.0106
20120101-20121231	9.99	-10.0	-1.37	-7.06	93.33	-2.55(-0.162)	15.98	0.4	-3.03	-0.7	963 X 1409	-9.37	3.25	-4.75	-0.0145
20130101-20131231	9.98	-9.99	-1.19	-6.26	93.02	-1.82(-0.115)	12.05	0.45	-2.69	-0.47	965 X 1482	15.87	19.03	-28.37	-0.0117
20140101-20141231	9.92	-9.97	-0.35	-1.82	89.61	-0.55(-0.035)	7.71	0.49	-0.81	-0.08	1009 X 1503	34.91	35.54	-38.35	-0.0054
20150101-20151231	9.85	-9.87	-2.27	-11.91	79.36	-1.45(-0.092)	25.94	0.39	-5.95	-0.56	1129 X 1575	59.97	46.78	-83.37	-0.0173
20160101-20161231	9.77	-9.94	-1.93	-9.9	87.71	-2.29(-0.145)	29.76	0.36	-4.57	-0.77	1146 X 1719	-27.31	-15.42	6.97	-0.0199
20170101-20171231	9.73	-9.89	-0.35	-1.82	91.86	-0.53(-0.034)	7.0	0.42	-0.79	-0.07	1288 X 1961	-28.15	0.88	24.12	-0.0073
20180101-20181231	9.93	-9.96	-3.06	-15.84	93.04	-4.73(-0.299)	30.95	0.34	-6.81	-1.95	1387 X 2126	-70.57	-38.75	38.67	-0.0257
20190101-20191231	9.95	-9.95	-4.59	-23.66	96.32	-8.11(-0.513)	46.19	0.29	-9.82	-4.02	1432 X 2185	-16.95	26.71	-30.35	-0.0327
20200101-20200331	9.98	-9.93	-0.34	-7.26	91.92	-1.21(-0.076)	9.8	0.38	-3.2	-0.34	1479 X 2210	-28.53	-12.47	13.95	-0.0138
20100104-20200331	9.91	-9.96	-18.4	-9.3	90.13	-2.19(-0.139)	186.97	0.4	-4.13	-0.7	1108 X 1640	-10.04	4.85	-8.57	-0.0164

Figure 3: 回测结果

-0.7316	2.96	7.85	4.41	1.14	100	214812_pv_model_2_mod_gen4_191114_126
-0.7359	4.79	11.15	3.55	2.26	108	214552_fac27
-0.7584	3.88	7.67	1.9	1.48	175	211930_h_ori182

Figure 4: 相关性结果

### 3 Alpha103

$$Alpha = ((20 - LOWDAY(LOW, 20)) / 20) * 100 \quad (3)$$

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	-0.08	-0.41	34.29	-0.1(-0.006)	13.72	0.52	-0.48	-0.01	898 X 890	14.05	14.01	-14.88	-0.0005
20110101-20111231	10.0	-10.0	-0.59	-3.05	33.02	-0.86(-0.054)	12.19	0.48	-3.69	-0.26	893 X 1230	-37.07	-39.34	30.98	-0.0079
20120101-20121231	10.0	-10.0	-1.54	-7.9	31.22	-2.48(-0.157)	17.16	0.43	-10.12	-1.25	1081 X 1278	-2.65	3.25	-13.16	-0.0157
20130101-20131231	10.0	-10.0	-1.05	-5.54	33.2	-1.94(-0.123)	12.16	0.45	-6.67	-0.79	1341 X 1104	21.26	19.03	-32.33	-0.0095
20140101-20141231	10.0	-10.0	0.86	4.38	29.62	1.39(0.088)	7.18	0.51	5.91	0.53	1363 X 1141	45.58	35.54	-36.83	0.0023
20150101-20151231	10.02	-9.96	-0.8	-4.06	33.16	-0.27(-0.017)	36.65	0.45	-4.96	-0.09	1499 X 1196	63.4	46.78	-72.04	-0.0155
20160101-20161231	10.01	-9.99	-0.28	-1.45	29.48	-0.24(-0.015)	14.84	0.47	-1.94	-0.05	1425 X 1433	-13.84	-15.42	10.99	-0.0104
20170101-20171231	10.01	-9.99	0.09	0.49	27.5	0.14(0.009)	6.06	0.47	0.71	0.02	1575 X 1654	-20.12	0.88	21.12	-0.0047
20180101-20181231	10.03	-9.97	-2.12	-10.89	30.24	-2.95(-0.187)	24.96	0.38	-14.41	-1.77	1638 X 1869	-62.93	-38.75	41.43	-0.0201
20190101-20191231	10.0	-10.0	-2.01	-10.28	31.67	-4.42(-0.279)	20.97	0.43	-12.98	-2.52	1810 X 1799	10.93	26.71	-31.49	-0.0146
20200101-20200331	10.0	-10.0	0.01	0.16	37.2	0.04(0.002)	4.0	0.5	0.13	0.0	1755 X 1919	-18.03	-12.47	18.28	-0.004
20100104-20200331	10.01	-9.99	-7.51	-3.77	31.47	-0.63(-0.04)	86.2	0.46	-4.8	-0.22	1362 X 1373	1.38	4.85	-8.93	-0.0095

Figure 5: 回测结果

-0.6941	3.48	4.27	2.2	4.56	175	211919_my_11
-0.7045	2.24	3.64	-0.62	1.47	100	214821_pv_model_3_mod_gen6_191114_177
-0.715	2.8	7.46	5.98	1.9	110	214389_pv_model_2_2_191101_25

Figure 6: 相关性结果

### 4 Alpha104

$$Alpha = (-1 * (DELTA(CORR(HIGH, VOLUME, 5), 5) * RANK(STD(CLOSE, 20)))) \quad (4)$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	9.92	-9.92	0.25	254.71	90.95	1.45(0.092)	4.11	0.5	0.58	2.43	749 X 757	20.52	14.01	-17.89	0.0041
20110101-20111231	9.75	-9.76	1.29	246.31	90.26	0.82(0.052)	1.76	0.64	2.99	1.35	885 X 875	-25.53	-38.1	39.04	0.0112
20120101-20121231	9.14	-9.14	1.01	-2769.66	94.98	-1.23(-0.078)	1.48	0.56	2.39	-6.65	968 X 958	22.51	-0.37	-11.17	0.0047
20130101-20131231	8.99	-8.99	0.9	-615.7	96.07	-0.41(-0.026)	1.38	0.55	2.2	-1.03	1026 X 1043	27.86	15.86	-17.28	0.0136
20140101-20141231	8.69	-8.69	0.83	1500.12	95.99	1.54(0.097)	2.09	0.53	2.02	6.07	963 X 977	38.74	35.83	-29.03	0.0086
20150101-20151231	9.98	-9.99	1.42	7.19	88.74	1.79(0.113)	6.96	0.55	3.28	0.51	1087 X 1088	81.46	46.78	-66.83	0.0066
20160101-20161231	9.01	-9.02	0.92	6008.46	95.65	1.34(0.085)	3.0	0.53	2.19	10.62	1139 X 1137	-0.71	-9.55	11.2	0.0036
20170101-20171231	8.72	-8.73	0.65	1393.67	96.01	0.94(0.06)	2.75	0.54	1.6	3.6	1290 X 1283	-8.1	1.45	15.75	0.0033
20180101-20181231	9.04	-9.05	1.42	833.76	94.36	2.02(0.128)	1.89	0.6	3.42	6.01	1505 X 1491	-15.0	-36.15	31.14	0.0074
20190101-20191231	8.05	-8.08	0.39	831.08	101.6	1.54(0.097)	5.4	0.53	0.98	4.39	1439 X 1435	32.85	21.77	-27.75	0.0045
20200101-20200331	8.8	-8.85	-0.03	-17.47	93.58	-0.15(-0.01)	1.84	0.43	-0.28	-0.06	1588 X 1647	45.35	-12.47	-46.38	-0.0015
20100104-20200331	9.12	-9.13	9.05	756.11	94.23	0.43(0.027)	7.62	0.55	2.12	1.22	1117 X 1117	18.27	4.74	-8.29	0.0065

Figure 7: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.4493	3.01	4.53	0.21	1.05	97	215056_fac140
0.4135	6.22	8.58	1.85	3.28	107	214560_fac123
0.4045	4.45	3.84	1.5	1.83	100	214850_fac132

Figure 8: 相关性结果

## 5 Alpha105

$$Alpha = (-1 * CORR(RANK(OPEN), RANK(VOLUME), 10)) \quad (5)$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	3.84	-3.84	0.59	345.74	53.6	1.03(0.065)	2.37	0.21	5.89	2.61	263 X 299	-15.47	-9.63	31.26	0.0051
20110101-20111231	1.84	-1.84	0.4	-72.99	61.61	-0.28(-0.018)	2.71	0.13	7.25	-0.3	154 X 171	22.32	-2.5	0.03	0.0025
20120101-20121231	1.4	-1.4	0.16	-18.31	67.54	-0.4(-0.025)	2.62	0.1	3.43	-0.21	126 X 144	54.36	6.56	-42.78	0.0003
20130101-20131231	0.0	0.0	0.0	0.0	nan	nan(nan)	nan	0.0	nan	nan	0 X 0	nan	0.0	nan	0.0
20140101-20141231	5.43	-5.43	0.98	991.38	54.59	1.44(0.091)	2.49	0.39	6.75	6.12	570 X 635	66.45	35.11	-48.05	0.0103
20150101-20151231	5.61	-5.57	1.32	-39.09	56.63	-0.17(-0.011)	6.57	0.37	8.51	-0.14	562 X 623	19.65	3.75	4.39	0.0034
20160101-20161231	0.29	-0.28	0.17	266.11	68.45	1.02(0.064)	3.47	0.03	18.21	2.01	35 X 40	-76.58	-2.16	139.94	0.0018
20170101-20171231	5.69	-5.68	1.33	1935.32	51.65	1.29(0.081)	2.16	0.37	9.25	7.88	821 X 910	-6.79	-1.43	30.7	0.0123
20180101-20181231	3.21	-3.21	0.34	-76.77	56.52	-0.62(-0.039)	3.21	0.21	3.84	-0.72	483 X 546	-5.07	-11.81	15.92	-0.0015
20190101-20191231	7.49	-7.5	1.24	269.96	47.24	1.33(0.084)	2.42	0.48	7.19	3.18	1249 X 1437	18.68	10.77	-1.7	0.0086
20200101-20200331	1.72	-1.72	0.01	34.43	59.86	0.63(0.04)	2.1	0.14	0.54	0.48	288 X 345	-8.99	-32.42	10.57	0.0074
20100104-20200331	3.45	-3.45	6.53	354.01	54.0	0.64(0.04)	10.69	0.23	7.05	1.64	424 X 479	16.76	2.08	2.25	0.0044

Figure 9: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.472	4.5	2.6	3.82	2.6	97	215063_qh69
0.4533	2.61	5.03	4.69	1.25	90	215417_fac152
0.4522	3.69	3.54	3.39	4.39	175	211919_my_167

Figure 10: 相关性结果

## 6 Alpha106

$$Alpha = CLOSE - DELAY(CLOSE, 20) \quad (6)$$

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	-3.11	-16.04	37.35	-2.58(-0.163)	39.3	0.43	-17.18	-1.69	870 X 917	-12.33	14.01	-19.76	-0.0037
20110101-20111231	10.0	-10.0	-1.21	-6.2	29.75	-1.11(-0.07)	15.45	0.44	-8.33	-0.51	1148 X 974	-43.32	-39.34	30.93	-0.0017
20120101-20121231	10.0	-10.0	-1.86	-9.53	32.67	-1.64(-0.104)	19.31	0.42	-11.69	-0.89	1229 X 1130	-9.31	3.25	-9.78	-0.0024
20130101-20131231	9.98	-10.0	-2.22	-11.74	31.67	-1.74(-0.11)	23.22	0.43	-14.73	-1.06	1069 X 1377	6.17	19.03	-29.45	-0.0031
20140101-20141231	9.86	-10.01	-4.26	-21.79	32.76	-3.07(-0.194)	50.52	0.43	-26.74	-2.51	1080 X 1424	-0.04	35.54	-43.44	-0.0042
20150101-20151231	9.99	-9.98	3.94	19.82	24.85	1.45(0.092)	22.82	0.52	32.56	1.3	1191 X 1505	96.82	46.78	-56.39	0.0023
20160101-20161231	9.98	-10.0	-2.69	-13.84	33.77	-2.04(-0.129)	30.16	0.45	-16.36	-1.31	1346 X 1513	-39.33	-15.42	11.64	-0.0026
20170101-20171231	10.0	-10.0	0.31	1.59	28.88	0.25(0.016)	13.71	0.5	2.22	0.06	1577 X 1650	-32.42	0.88	35.62	0.0001
20180101-20181231	9.99	-9.97	-1.66	-8.4	30.42	-1.5(-0.095)	20.62	0.44	-11.25	-0.79	1994 X 1512	-63.17	-38.75	46.17	-0.003
20190101-20191231	9.98	-10.0	-1.34	-6.68	31.18	-0.89(-0.057)	22.11	0.44	-8.8	-0.41	1668 X 1942	9.51	26.71	-23.2	-0.0025
20200101-20200331	9.96	-10.06	-0.37	-7.89	29.9	-0.96(-0.061)	13.61	0.52	-10.59	-0.49	1641 X 2041	-34.9	-12.47	18.79	-0.0044
20100104-20200331	9.98	-10.0	-14.46	-7.28	31.29	-0.97(-0.061)	149.41	0.45	-9.3	-0.47	1325 X 1410	-9.38	4.85	-5.17	-0.0021

Figure 11: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
-0.3822	2.41	4.93	2.86	1.53	100	214819_pv_model_2_mod_gen2_191114_42
-0.4393	3.43	4.55	3.86	2.38	175	211919_my_199
-0.4506	3.45	5.5	5.68	2.46	146	213024_agen.ZSAlpha_50

Figure 12: 相关性结果

## 7 Alpha107

$$\begin{aligned} Alpha = & (((-1 * RANK((OPEN - DELAY(HIGH, 1)))) * RANK((OPEN - DELAY(CLOSE, 1)))) \\ & * RANK((OPEN - DELAY(LOW, 1)))) \end{aligned} \quad (7)$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	10.0	-9.98	1.26	6.53	130.07	2.6(0.165)	2.11	0.57	2.01	0.58	1207 X 607	15.95	14.01	-2.92	0.0101
20110101-20111231	10.0	-9.99	0.52	2.66	130.1	1.59(0.101)	1.69	0.51	0.82	0.23	1416 X 729	-33.62	-39.34	38.98	0.0055
20120101-20121231	10.0	-9.97	0.13	0.68	129.51	0.37(0.023)	4.43	0.49	0.21	0.03	1574 X 799	3.9	3.25	-2.56	0.0023
20130101-20131231	10.01	-9.93	0.29	1.54	129.12	0.6(0.038)	2.86	0.52	0.48	0.07	1643 X 804	25.23	19.03	-22.32	0.0028
20140101-20141231	10.01	-9.83	0.79	4.06	128.52	1.76(0.112)	3.56	0.56	1.27	0.31	1700 X 811	38.65	35.54	-31.14	0.004
20150101-20151231	10.04	-9.55	2.54	13.69	123.37	1.1(0.069)	23.57	0.51	4.31	0.37	1840 X 864	79.4	46.78	-56.15	0.0074
20160101-20161231	10.0	-9.66	-0.52	-2.76	131.07	-0.8(-0.05)	7.62	0.47	-0.83	-0.12	1918 X 947	-15.88	-15.42	10.89	-0.004
20170101-20171231	9.99	-9.69	-0.41	-2.17	128.57	-1.1(-0.07)	5.47	0.48	-0.66	-0.14	2185 X 1065	-20.45	0.88	16.77	-0.0024
20180101-20181231	9.99	-9.89	1.4	7.23	130.54	2.9(0.183)	1.64	0.6	2.21	0.68	2335 X 1178	-39.84	-38.75	54.79	0.0098
20190101-20191231	10.01	-9.85	1.5	7.73	129.77	3.93(0.249)	1.42	0.58	2.38	0.96	2421 X 1196	21.56	26.71	-6.33	0.0103
20200101-20200331	10.01	-9.81	0.03	0.3	129.03	0.06(0.004)	4.84	0.45	0.18	0.0	2455 X 1233	-14.08	-12.47	15.55	0.0019
20100104-20200331	10.0	-9.83	7.53	3.84	129.07	0.84(0.053)	23.64	0.53	1.18	0.15	1839 X 908	7.01	4.85	0.56	0.0045

Figure 13: 回测结果

Corr	ISSharpe	SemiOS	OSSharpe	Fitness	OSdays	ID
0.4568	6.37	9.54	2.87	4.41	101	214811_pv_model_2_mod_gen6_191114_134
0.4544	3.94	5.01	1.25	1.22	90	215385_fac176
0.4544	4.05	5.2	0.59	2.14	175	211919_my_194

Figure 14: 相关性结果

## 8 Alpha108

$$Alpha = ((RANK((HIGH - MIN(HIGH, 2))) * RANK(CORR((VWAP), (MEAN(VOLUME, 120)), 6))) * -1) \quad (8)$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	8.47	-8.47	-2.57	-13.26	63.52	-2.56(-0.162)	40.88	0.42	-9.86	-1.17	101 X 93	-31.73	-5.89	0.42	-0.0167
20110101-20111231	8.4	-8.4	-1.15	-5.91	62.05	-1.47(-0.093)	23.03	0.4	-4.54	-0.45	133 X 121	-44.55	-36.33	30.47	-0.0065
20120101-20121231	10.0	-10.0	-0.79	-4.05	58.48	-1.43(-0.09)	9.99	0.44	-2.77	-0.38	255 X 228	-0.75	3.25	-7.35	-0.0088
20130101-20131231	10.0	-10.0	-2.58	-13.55	55.42	-6.88(-0.435)	25.8	0.32	-9.78	-3.4	956 X 857	11.51	19.03	-38.6	-0.0239
20140101-20141231	10.0	-10.0	-1.01	-5.17	54.75	-2.36(-0.149)	10.8	0.43	-3.78	-0.72	830 X 743	32.01	35.54	-42.36	-0.0109
20150101-20151231	10.01	-9.99	-2.79	-14.32	56.49	-2.86(-0.181)	31.19	0.43	-10.12	-1.44	559 X 502	49.48	46.78	-78.16	-0.0173
20160101-20161231	10.0	-10.0	-0.21	-1.07	56.18	-0.55(-0.035)	12.08	0.42	-0.76	-0.08	867 X 775	-13.73	-15.42	11.6	-0.0041
20170101-20171231	10.0	-10.0	-0.69	-3.54	54.67	-1.96(-0.124)	10.73	0.46	-2.59	-0.5	1130 X 1009	-20.73	0.88	13.65	-0.0063
20180101-20181231	10.0	-10.0	-1.52	-7.8	54.2	-4.84(-0.306)	15.89	0.36	-5.76	-1.84	1407 X 1260	-41.29	-38.75	25.68	-0.0136
20190101-20191231	10.0	-10.0	-1.39	-7.11	54.52	-4.23(-0.267)	14.83	0.39	-5.22	-1.53	1720 X 1537	18.61	26.71	-32.84	-0.0108
20200101-20200331	10.0	-10.0	0.04	0.83	52.52	0.3(0.019)	2.32	0.6	0.63	0.04	1808 X 1617	-10.84	-12.47	12.51	-0.0007
20100104-20200331	9.7	-9.69	-14.66	-7.37	56.74	-2.36(-0.149)	161.47	0.41	-5.35	-0.85	820 X 734	-3.19	3.21	-12.0	-0.0116

Figure 15: 回测结果

Corr	-0.3751	4.74	9.32	4.24	2.36	110	214386_pv_model_3_2_191101_0
ISSharpe	-0.4066	4.05	5.2	0.59	2.14	175	211919_my_194
SemiOS	-0.4775	4.04	5.06	3.33	1.82	175	211919_my_233

Figure 16: 相关性结果

## 9 Alpha109

$$Alpha = SMA(HIGH - LOW, 10, 2) / SMA(SMA(HIGH - LOW, 10, 2), 10, 2) \quad (9)$$

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	-1.63	-8.4	31.54	-1.75(-0.11)	21.1	0.45	-10.66	-0.9	857 X 957	-1.58	14.01	-15.24	-0.0077
20110101-20111231	10.0	-10.0	-2.68	-13.71	31.05	-3.27(-0.207)	28.39	0.43	-17.66	-2.17	1003 X 1142	-50.97	-39.34	23.56	-0.013
20120101-20121231	10.0	-9.99	-2.9	-14.93	31.88	-3.84(-0.243)	31.53	0.42	-18.73	-2.62	1088 X 1286	-21.07	3.25	-8.78	-0.0149
20130101-20131231	10.0	-10.0	-4.21	-22.11	27.76	-3.94(-0.249)	42.13	0.41	-31.87	-3.52	1114 X 1333	0.07	19.03	-44.31	-0.0183
20140101-20141231	9.99	-9.98	-3.71	-19.01	26.0	-3.2(-0.202)	40.43	0.41	-29.18	-2.73	1226 X 1285	22.32	35.54	-60.33	-0.0135
20150101-20151231	9.98	-9.91	-5.3	-27.66	23.19	-1.26(-0.079)	81.14	0.51	-47.13	-1.37	1473 X 1231	37.59	46.78	-92.69	-0.0016
20160101-20161231	9.98	-9.85	-4.2	-21.87	25.91	-1.9(-0.12)	42.1	0.46	-33.52	-1.74	1399 X 1466	-41.13	-15.42	-2.02	-0.0099
20170101-20171231	9.98	-9.83	-4.33	-22.39	27.36	-3.77(-0.239)	43.57	0.42	-32.72	-3.41	1591 X 1658	-60.99	0.88	16.8	-0.0159
20180101-20181231	9.97	-9.96	-1.99	-10.28	29.52	-1.7(-0.108)	22.42	0.46	-13.9	-1.0	1678 X 1834	-75.73	-38.75	55.32	-0.0064
20190101-20191231	10.0	-9.9	-5.13	-26.36	31.11	-6.83(-0.432)	51.28	0.31	-33.93	-6.28	1545 X 2071	-24.5	26.71	-28.3	-0.0301
20200101-20200331	10.0	-9.9	-0.54	-11.84	29.35	-1.74(-0.11)	13.53	0.47	-15.98	-1.11	1580 X 2109	-40.6	-12.47	17.46	-0.0173
20100104-20200331	9.99	-9.94	-36.61	-18.52	28.55	-2.04(-0.129)	369.6	0.43	-25.85	-1.64	1305 X 1443	-22.06	4.85	-14.83	-0.0132

Figure 17: 回测结果

-0.7175	3.0	6.19	7.73	2.81	129	213812_gpd1_v1v2_7
-0.7495	3.56	9.53	6.53	2.76	136	213518_h8711
-0.7838	3.23	8.31	8.2	3.76	110	214423_pv_model_5_2_191101_42

Figure 18: 相关性结果

## 10 Alpha110

$$Alpha = SUM(MAX(0, HIGH - DELAY(CLOSE, 1)), 20) / SUM(MAX(0, DELAY(CLOSE, 1) - LOW), 20) * 100 \quad (10)$$

dates	long(M)	short(M)	pnl(M)	%ret	%tvr	shrp (IR)	%dd	%win	bpmrgn	fitness	Coverage	%posret	%inxret	%negret	IC
20100104-20101231	9.85	-9.97	-0.21	-1.36	43.61	-0.16(-0.01)	24.68	0.44	-1.01	-0.03	792 X 980	12.24	14.01	-14.29	-0.0085
20110101-20111231	9.8	-9.93	-4.34	-23.29	36.9	-2.16(-0.137)	66.17	0.48	-24.44	-1.72	992 X 1105	-19.42	-39.34	-25.63	-0.0107
20120101-20121231	9.87	-9.89	-5.86	-30.85	37.33	-3.66(-0.231)	61.42	0.37	-32.7	-3.32	1100 X 1235	-10.52	3.25	-50.5	-0.0222
20130101-20131231	9.39	-9.71	-6.39	-35.2	67.51	-2.7(-0.171)	70.12	0.41	-20.83	-1.95	1061 X 1344	-27.76	19.03	-42.31	-0.0118
20140101-20141231	9.12	-8.67	-2.0	-9.76	78.82	-0.49(-0.031)	56.39	0.51	-5.81	-0.17	1100 X 1309	23.66	35.54	-48.4	-0.004
20150101-20151231	8.15	-8.93	-3.29	-25.32	85.09	-1.13(-0.071)	106.72	0.48	-9.28	-0.62	1210 X 1325	80.52	46.78	-111.18	-0.0033
20160101-20161231	9.07	-8.69	0.15	-1.31	110.35	-0.06(-0.004)	53.82	0.49	0.31	-0.01	1364 X 1460	-11.74	-15.42	13.97	0.0005
20170101-20171231	9.73	-9.18	7.42	39.85	110.73	2.06(0.13)	22.06	0.57	14.51	1.23	1463 X 1727	-23.46	0.88	107.61	0.006
20180101-20181231	9.84	-9.27	2.15	11.26	72.64	0.67(0.042)	21.48	0.49	6.36	0.26	1515 X 1959	-79.66	-38.75	108.38	-0.0042
20190101-20191231	9.94	-9.87	-9.84	-50.18	38.0	-4.83(-0.306)	103.01	0.34	-53.56	-5.55	1563 X 2045	7.25	26.71	-109.46	-0.0194
20200101-20200331	9.93	-10.01	-0.43	-9.25	31.94	-1.33(-0.084)	12.49	0.45	-11.65	-0.71	1560 X 2121	-27.61	-12.47	8.87	-0.015
20100104-20200331	9.49	-9.42	-22.66	-12.49	66.25	-0.79(-0.05)	303.21	0.46	-7.26	-0.34	1225 X 1465	-6.87	4.85	-17.23	-0.0079

Figure 19: 回测结果

-0.1325	3.23	6.06	2.74	1.54	100	214818_pv_model_2_gen2_191114_46
-0.1336	5.42	6.51	3.37	2.66	100	214817_pv_model_2_gen4_191114_51
-0.1343	3.14	7.08	4.21	1.1	101	214809_pv_model_2_gen6_191114_32

Figure 20: 相关性结果