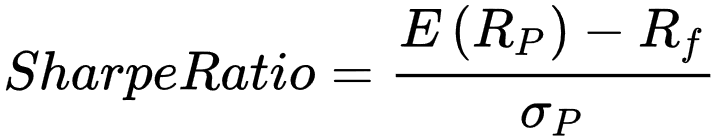
量 化

说到量化，其实是一种对股票、债券、期权、期货及其他衍生产品的建模过程。

所谓“鸡蛋不要放在一个篮子里”，在实际投资中，为了规避风险（），我们也往往会将资金分散在不同的产品中。

**一. 夏普比率**

我们会根据产品在过去的表现来选择我们要把钱投资给哪几个产品，而我们考虑产品的时候主要有以下两个个指标：超额收益率、方差。夏普比率就是在考虑了这两个指标后，根据单位风险标准差所对应的超额收益率来判断一只股票的好坏的。



所以首先要选取一个无风险收益率，在我国的股市条件下，关于无风险收益率的选择实际上并没有什么统一的标准。在此，我以余额宝的天宏货币基金作为无风险利率，目前为止是1.4%。

**1. 单只股票在不同年份中的夏普比率**

在此，我们选取贵州茅台（600519.SH），利用tushare作为数据获取工具，用python计算其近六年的sharpe ratio。代码如下：

import tushare as ts

import numpy as np

import math

ts.set\_token('\*\*\*\*\*passport\*\*\*\*\*')

pro = ts.pro\_api()

df\_1 = pro.daily(ts\_code='600519.SH', start\_date='20200101', end\_date='20201231')

df\_2 = pro.daily(ts\_code='600519.SH', start\_date='20190101', end\_date='20191231')

df\_3 = pro.daily(ts\_code='600519.SH', start\_date='20180101', end\_date='20181231')

df\_4 = pro.daily(ts\_code='600519.SH', start\_date='20170101', end\_date='20171231')

df\_5 = pro.daily(ts\_code='600519.SH', start\_date='20160101', end\_date='20161231')

df\_6 = pro.daily(ts\_code='600519.SH', start\_date='20150101', end\_date='20151231')

years = [df\_1, df\_2, df\_3, df\_4, df\_5, df\_6]

for x in years:

a = np.log(x['close'].shift(1)/x['close'])

sharpe=(a.mean()\*252-0.014)/(a.std()\*math.sqrt(252))

print(sharpe)

**output：**

2.021584075150825

2.285410562377124

-0.5519320030736873

2.7929712958262973

1.7804103420336588

0.1564830688676877

**改进版：**

import tushare as ts

import numpy as np

import math

ts.set\_token('\*\*\*\*\*passport\*\*\*\*\*')

pro = ts.pro\_api()

for x in range(2020,2010,-1):

df = pro.daily(ts\_code='600519.SH', start\_date=str(x)+'0101', end\_date=str(x)+'1231')

a = np.log(df['close'].shift(1)/df['close'])

sharpe=(a.mean()\*252-0.014)/(a.std()\*math.sqrt(252))

print('sharpe in '+str(x)+' = '+str('%.4f' % sharpe))

**output：**

sharpe in 2020 = 2.0216

sharpe in 2019 = 2.2854

sharpe in 2018 = -0.5519

sharpe in 2017 = 2.7930

sharpe in 2016 = 1.7804

sharpe in 2015 = 0.1565

sharpe in 2014 = 1.1952

sharpe in 2013 = -1.7412

sharpe in 2012 = 0.3610

sharpe in 2011 = 0.1078

改进版相比于最初的版本具有更好的可集成性。下面用改进版本进行多只股票的集成。

**2. 同时计算多股票在不同年份中的夏普比率**

import tushare as ts

import numpy as np

import pandas as pd

import math

ts.set\_token('\*\*\*\*\*passport\*\*\*\*\*')

pro = ts.pro\_api()

lists\_1 = ['000001.SH','399001.SZ','399300.SZ']

lists\_2 = ['600519.SH','002230.SZ']

lists = lists\_1 + lists\_2

table = pd.DataFrame([], columns = ['2020', '2019', '2018', '2017', '2016', '2015', '2014', '2013', '2012', '2011'], index = lists)

for one in lists\_1:

for x in range(2020,2010,-1):

df = pro.index\_daily(ts\_code = one, start\_date=str(x)+'0101', end\_date = str(x) + '1231')

a = np.log(df['close'].shift(1)/df['close'])

sharpe = (a.mean()\*252-0.014)/(a.std()\*math.sqrt(252))

# print(str(one) + ' sharpe in '+str(x)+' = '+str('%.4f' % sharpe))

table[str(x)][one] = '%.4f' % sharpe

for one in lists\_2:

for x in range(2020,2010,-1):

df = pro.daily(ts\_code = one, start\_date=str(x)+'0101', end\_date=str(x)+'1231')

a = np.log(df['close'].shift(1)/df['close'])

sharpe = (a.mean()\*252-0.014)/(a.std()\*math.sqrt(252))

# print(str(one) + ' sharpe in '+str(x)+' = '+str('%.4f' % sharpe))

table[str(x)][one] = '%.4f' % sharpe

print(table)

table.to\_csv('C://Users//84695//Desktop//生活琐碎//quant//data.csv')

**output：**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2020** | **2019** | **2018** | **2017** | **2016** | **2015** | **2014** | **2013** | **2012** | **2011** |
| **000001.SH** | 0.5445 | 1.1434 | -1.6241 | 0.4758 | -0.3432 | 0.1093 | 2.4782 | -0.4978 | 0.1893 | -1.5457 |
| **399001.SZ** | 1.2826 | 1.6199 | -1.9304 | 0.444 | -0.5472 | 0.1981 | 1.4933 | -0.5808 | 0.1555 | -1.7395 |
| **399300.SZ** | 0.7571 | 1.6147 | -1.5486 | 1.7796 | -0.2942 | 0.0281 | 2.1842 | -0.4447 | 0.409 | -1.6119 |
| **600519.SH** | 2.0216 | 2.2854 | -0.5519 | 2.793 | 1.7804 | 0.1565 | 1.1952 | -1.7412 | 0.361 | 0.1078 |
| **002230.SZ** | 0.3196 | 0.7763 | -1.5911 | 1.6408 | -0.622 | 0.3833 | -0.9076 | 1.0844 | -0.1961 | -1.4855 |

**数据处理（by Excel）：**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **average** | **std** | **sharpe’s sharpe** |
| **000001.SH** | 0.0930 | 1.1544 | 0.0805 |
| **399001.SZ** | 0.0396 | 1.1888 | 0.0333 |
| **399300.SZ** | 0.2873 | 1.2546 | 0.2290 |
| **600519.SH** | 0.8408 | 1.3470 | 0.6242 |
| **002230.SZ** | -0.0598 | 1.0330 | -0.0579 |

可以看到同一只股票在不同年份的sharpe值差距甚远，简单地用前一年的值来预测后一年，是万万不可取的。

上面的夏普比率反应了一只股票在不同年份收益和风险的变化，在构建投资组合的时候具有用处。同时，通过sharpe比率还可以比较不同板块在不同年份的表现。

下面我们来看看不同年份里，都是哪些板块夏普比率表现得很好。

**3. 不同板块的指数在不同年份中的夏普比率**

import tushare as ts

import numpy as np

import pandas as pd

import math

ts.set\_token('\*\*\*\*\*passport\*\*\*\*\*')

pro = ts.pro\_api()

df\_x = pro.index\_basic(market='SW',category='一级行业指数')

table = pd.DataFrame([], columns=['name','2020','2019','2018','2017','2016','2015','2014','2013','2012','2011'])

table['name']=df\_x['name']

table.index=df\_x['ts\_code']

for one in df\_x['ts\_code']:

for x in range(2020,2010,-1):

df = pro.index\_weekly(ts\_code = str(one), start\_date=str(x)+'0101', end\_date=str(x)+'1231')

a = np.log(df['close'].shift(1)/df['close'])

sharpe = (a.mean()\*52-0.014)/(a.std()\*math.sqrt(52))

table[str(x)][one] = '%.4f' % sharpe

print(table)

table.to\_excel('C://Users//84695//Desktop//生活琐碎//quant//industry.xls')

**output（已修饰）：**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **name** | **2020** | **2019** | **2018** | **2017** | **2016** | **2015** | **2014** | **2013** | **2012** | **2011** |
| 农林牧渔 | 1.6191 | 0.9592 | -1.3713 | -1.2425 | 0.0902 | 0.929 | 0.7068 | 0.6536 | 0.0968 | -1.5919 |
| 采掘 | -0.6083 | 0.214 | -1.9421 | -0.2361 | -0.173 | -0.132 | 1.151 | -1.8325 | -0.1588 | -1.4815 |
| 化工 | 1.119 | 0.8143 | -1.881 | -0.5474 | 0.2957 | 0.8562 | 1.3715 | 0.2631 | 0.1153 | -1.5728 |
| 钢铁 | -0.3193 | -0.2712 | -1.5699 | 0.5878 | -0.4366 | 0.0479 | 2.199 | -1.3598 | -0.3049 | -1.5247 |
| 有色金属 | 0.3922 | 0.6811 | -2.0916 | 0.5474 | 0.1358 | 0.2003 | 1.6591 | -1.6231 | 0.4911 | -1.8358 |
| 电子 | 1.0941 | 1.9498 | -1.8729 | 0.6475 | 0.1078 | 1.0391 | 0.5701 | 1.3386 | 0.1889 | -2.1271 |
| 家用电器 | 0.5782 | 1.7108 | -1.5788 | 1.6788 | 0.4645 | 0.7319 | 1.1219 | 1.4419 | 0.7262 | -1.1572 |
| 食品饮料 | 2.3278 | 2.1575 | -1.0575 | 2.2651 | 0.9043 | 0.6295 | 0.8442 | -0.4996 | 0.0947 | -0.5234 |
| 纺织服装 | -0.1797 | 0.1568 | -1.9507 | -2.0531 | -0.0827 | 1.1818 | 1.5387 | 0.301 | -0.3076 | -1.4137 |
| 轻工制造 | 0.952 | 0.6266 | -1.9962 | -1.0909 | -0.1203 | 1.4161 | 1.2495 | 0.9059 | 0.0486 | -1.6119 |
| 医药生物 | 2.5947 | 1.4175 | -1.254 | 0.1626 | -0.0013 | 1.0002 | 0.7496 | 1.4644 | 0.6704 | -1.6035 |
| 公用事业 | 0.2146 | 0.1746 | -1.8612 | -0.8582 | -0.445 | 0.4694 | 2.5636 | 0.4948 | 0.422 | -1.3766 |
| 交通运输 | -0.0285 | 0.6104 | -1.7802 | 0.1808 | -0.6537 | 0.5678 | 2.0375 | 0.1513 | -0.2313 | -2.2603 |
| 房地产 | 0.029 | 0.7039 | -1.4151 | -0.1111 | -0.3488 | 0.8454 | 2.2374 | -0.6597 | 1.0604 | -1.3694 |
| 商业贸易 | 1.0229 | 0.2311 | -1.8026 | -1.2506 | -0.0216 | 0.692 | 1.3718 | 0.4082 | -0.4492 | -1.9595 |
| 休闲服务 | 1.628 | 1.1458 | -0.5206 | -0.4612 | -0.5681 | 1.2713 | 1.5716 | 0.8012 | 0.4795 | -1.1729 |
| 综合 | 1.014 | 0.8082 | -1.815 | -1.4272 | 0.0544 | 1.0766 | 1.9035 | 0.4475 | 0.0079 | -1.3651 |
| 建筑材料 | 1.7529 | 1.5098 | -1.5628 | 0.2144 | 0.5121 | 0.4898 | 2.3841 |  |  |  |
| 建筑装饰 | 0.1827 | -0.3232 | -1.6757 | -0.5617 | 0.422 | 0.3009 | 2.6171 |  |  |  |
| 电气设备 | 1.817 | 0.737 | -1.7981 | -0.7351 | -0.1719 | 0.8618 | 0.7906 |  |  |  |
| 国防军工 | 1.5842 | 0.5696 | -1.363 | -1.3506 | -0.3617 | 0.3776 | 1.461 |  |  |  |
| 计算机 | 1.0215 | 1.1374 | -0.8929 | -0.7131 | -0.6055 | 1.1411 | 0.7528 |  |  |  |
| 传媒 | 0.8565 | 0.5803 | -1.8601 | -1.9049 | -0.8435 | 1.081 | -0.01 |  |  |  |
| 通信 | 0.3208 | 0.4676 | -1.2501 | -0.3749 | -0.194 | 0.9877 | 1.0266 |  |  |  |
| 银行 | -0.9273 | 1.0851 | -0.9606 | 0.7482 | -0.0256 | 0.0207 | 2.0181 |  |  |  |
| 非银金融 | 0.1278 | 1.0975 | -1.1848 | 0.9749 | -0.2163 | -0.4056 | 2.8413 |  |  |  |
| 汽车 | 0.8363 | 0.537 | -1.9118 | -0.2967 | 0.1636 | 0.7383 | 1.858 |  |  |  |
| 机械设备 | 1.0178 | 0.8068 | -1.9315 | -0.9467 | -0.1112 | 0.689 | 1.8311 |  |  |  |

**数据处理（by Excel）：**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ts\_code** | **name** | **average** | **std** | **sharpe’s sharpe** |
| 801710.SI | 建筑材料 | 0.757186 | 1.196019 | 0.633088 |
| 801120.SI | 食品饮料 | 0.71426 | 1.169615 | 0.61068 |
| 801110.SI | 家用电器 | 0.57182 | 1.061037 | 0.538925 |
| 801150.SI | 医药生物 | 0.52006 | 1.198479 | 0.433933 |
| 801210.SI | 休闲服务 | 0.41746 | 0.967504 | 0.431481 |
| 801790.SI | 非银金融 | 0.462114 | 1.216814 | 0.379774 |
| 801750.SI | 计算机 | 0.263043 | 0.877824 | 0.299653 |
| 801780.SI | 银行 | 0.2798 | 1.003257 | 0.278892 |
| 801880.SI | 汽车 | 0.274957 | 1.084013 | 0.253648 |
| 801080.SI | 电子 | 0.29359 | 1.258264 | 0.233329 |
| 801730.SI | 电气设备 | 0.214471 | 1.114419 | 0.192451 |
| 801770.SI | 通信 | 0.140529 | 0.751543 | 0.186987 |
| 801890.SI | 机械设备 | 0.193614 | 1.18872 | 0.162876 |
| 801740.SI | 国防军工 | 0.131014 | 1.121466 | 0.116824 |
| 801720.SI | 建筑装饰 | 0.137443 | 1.209895 | 0.113599 |
| 801180.SI | 房地产 | 0.0972 | 1.081384 | 0.089885 |
| 801010.SI | 农林牧渔 | 0.0849 | 1.059962 | 0.080097 |
| 801030.SI | 化工 | 0.08339 | 1.046005 | 0.079722 |
| 801230.SI | 综合 | 0.07048 | 1.175244 | 0.059971 |
| 801140.SI | 轻工制造 | 0.03794 | 1.160246 | 0.0327 |
| 801160.SI | 公用事业 | -0.0202 | 1.165392 | -0.01733 |
| 801170.SI | 交通运输 | -0.14062 | 1.160342 | -0.12119 |
| 801050.SI | 有色金属 | -0.14435 | 1.189149 | -0.12139 |
| 801200.SI | 商业贸易 | -0.17575 | 1.103333 | -0.15929 |
| 801130.SI | 纺织服装 | -0.28092 | 1.150783 | -0.24411 |
| 801760.SI | 传媒 | -0.3001 | 1.159353 | -0.25885 |
| 801040.SI | 钢铁 | -0.29517 | 1.068157 | -0.27634 |
| 801020.SI | 采掘 | -0.51993 | 0.921429 | -0.56426 |

从上面我们可以看出，建筑材料、食品饮料、家用电器、医药生物、休闲服务在过去的十年间是优势板块。

将category的 ‘一级行业指数’ 分别换成 ‘二级行业指数’ ，‘三级行业指数’，可以得到更详细的数据，下面是category='二级行业指数' 得到的结果（已排序）：

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **name** | **2020** | **2019** | **2018** | **2017** | **2016** | **2015** | **2014** | **2013** | **2012** | **2011** |
| 生物制品 | 3.3907 | 1.4751 | -0.8895 | 0.8166 | 0.1083 | 1.2292 | 0.7314 | 2.0286 | 0.5158 | -1.5246 |
| 水泥制造 | 0.8882 | 1.7127 | -0.784 | 0.7963 | 0.4171 | -0.139 | 2.5724 |  |  |  |
| 食品加工 | 2.591 | 1.5853 | -0.9178 | 1.4789 | 0.1612 | 0.722 | 0.1186 | 1.7485 | -0.0201 | -0.6549 |
| 饮料制造 | 2.0842 | 2.2488 | -1.0759 | 2.4631 | 1.344 | 0.5293 | 1.3225 | -1.9104 | 0.1104 | -0.3462 |
| 医疗服务 | 2.1336 | 1.9971 | -0.6603 | 0.3349 | -0.2494 | 1.4466 | 0.6171 | 1.8759 | -0.1837 | -0.6057 |
| 其他建材 | 2.5857 | 1.1562 | -2.1925 | -0.2874 | 0.6876 | 0.8652 | 1.7929 |  |  |  |
| 白色家电 | 0.5247 | 1.6923 | -1.4879 | 1.9306 | 0.7029 | 0.7334 | 0.8602 | 1.479 | 0.7217 | -1.246 |
| 旅游综合 | 1.799 | 1.0812 | -0.1457 | 0.3695 | -0.7118 | 1.1155 | 1.4493 | 1.1264 | 0.2938 | -0.873 |
| 医疗器械 | 3.2595 | 1.54 | -1.1656 | -0.5899 | -0.3753 | 0.9916 | 0.6291 | 2.0049 | 0.2336 | -1.3522 |
| 化学制药 | 1.9446 | 1.8497 | -1.2017 | 0.6418 | 0.0809 | 0.9656 | 0.8454 | 1.1041 | 0.6891 | -1.9401 |
| 机场 | -0.2597 | 1.7739 | -0.0268 | 2.0032 | -0.0596 | 0.6442 | 1.3556 | 0.463 | 0.0442 | -1.0578 |
| 其他休闲服务 | 1.5898 | -0.3393 | -0.4938 | 0.9949 |  |  |  |  |  |  |
| 电子制造 | 1.138 | 2.1443 | -1.7846 | 1.0252 | 0.215 | 1.4262 | -0.1182 | 1.2674 | 0.5598 | -1.6883 |
| 动物保健 | 2.3334 | 0.8125 | -1.4622 | -0.0263 | 0.0954 | 1.8333 | 0.4669 | 1.485 | -0.0295 | -1.8757 |
| 地面兵装 | 1.2432 | 0.5173 | -1.0941 | -0.3106 | 0.1031 | 0.3265 | 1.683 |  |  |  |
| 半导体 | 1.4004 | 2.3589 | -1.3288 | 0.6059 | -0.3089 | 0.8289 | 0.7519 | 1.6163 | -0.1932 | -2.2348 |
| 房屋建设 | -0.2222 | -0.0582 | -0.8209 | -0.1517 | 1.1316 | -0.0222 | 2.5268 |  |  |  |
| 黄金 | 0.6793 | 0.8236 | -1.037 | -0.336 | 0.3043 | 0.106 | 1.7939 |  |  |  |
| 电源设备 | 1.9889 | 1.0653 | -1.7673 | -0.2746 | -0.3537 | 0.6439 | 0.8715 |  |  |  |
| 玻璃制造 | 1.3973 | 0.9914 | -1.8294 | -0.6958 | 0.0541 | 0.9306 | 1.2594 |  |  |  |
| 饲料 | 2.0968 | 1.3285 | -0.9917 | 0.1606 | -0.3476 | 0.9593 | -0.2227 | 0.7584 | 0.5276 | -1.3073 |
| 元件 | 0.8635 | 1.7099 | -0.9455 | -0.1475 | 0.3896 | 1.0574 | 1.0193 | 0.9813 | 0.0786 | -2.0447 |
| 保险 | -0.4957 | 1.3654 | -0.9313 | 2.2402 | 0.0712 | -0.0881 | 2.0113 | -0.6811 | 0.6772 | -1.3049 |
| 计算机设备 | 0.7155 | 1.0947 | -1.0411 | 0.2195 | -0.6279 | 1.119 | 0.7914 | 1.8652 | 0.3426 | -1.6392 |
| 医药商业 | 1.1603 | 0.6594 | -1.5635 | -0.0083 | 0.0132 | 0.8333 | 1.3155 | 1.1169 | 1.0043 | -1.8364 |
| 专业工程 | 1.1497 | -0.0102 | -1.9399 | -0.0938 | -0.0844 | 0.4083 | 2.2565 |  |  |  |
| 综合 | 1.0142 | 0.8086 | -1.8148 | -1.4268 | 0.0547 | 1.0766 | 1.9037 | 0.4475 | 0.0336 |  |
| 稀有金属 | 0.193 | 0.6227 | -1.7327 | 0.9976 | 0.0974 | 0.0713 | 1.3678 |  |  |  |
| 其他电子 | 1.2855 | 1.4759 | -1.5068 | -0.1311 | -0.0867 | 1.2284 | 0.7996 | 1.3917 | -0.2005 | -2.0073 |
| 航天装备 | 1.8302 | 0.5564 | -1.1364 | -1.2884 | -0.3999 | 0.6719 | 1.2293 |  |  |  |
| 化学纤维 | 1.1131 | 1.0792 | -1.5885 | 0.3613 | 0.2245 | 0.9487 | 2.2054 | 0.2529 | -0.5164 | -2.0499 |
| 计算机应用 | 1.0864 | 1.1432 | -0.8405 | -1.0608 | -0.5852 | 1.1362 | 1.3868 | 1.743 | -0.1885 | -1.8096 |
| 一般零售 | 1.1672 | 0.1103 | -1.8215 | -0.8093 | 0.2472 | 0.707 | 1.7955 |  |  |  |
| 视听器材 | 0.9257 | 0.7043 | -1.7931 | -0.8527 | -0.4355 | 0.5645 | 1.4348 | 1.0042 | 0.6116 | -0.6035 |
| 酒店 | 0.7189 | 0.8036 | -1.1717 | -1.2434 | -0.4395 | 1.1165 | 1.7121 | 0.4341 | 1.3723 | -1.8888 |
| 化学制品 | 1.2669 | 1.0052 | -1.6064 | -0.306 | 0.2028 | 0.8717 | 1.0983 | 0.319 | 0.1665 | -1.6668 |
| 造纸 | 1.1005 | 0.6633 | -1.9076 | -0.024 | 0.5667 | 0.7686 | 1.5119 | 0.0414 | 0.0065 | -1.3837 |
| 其他交运设备 | 1.0327 | 0.6067 | -1.8065 | -1.7588 | 0.8803 | 0.7538 | 1.2152 |  |  |  |
| 中药 | 1.1526 | 0.1662 | -1.6167 | -0.4127 | 0.0624 | 0.8236 | 0.4913 | 1.1692 | 0.6805 | -1.2342 |
| 基础建设 | -0.1127 | -0.5536 | -1.1189 | -0.7842 | 0.3283 | 0.1751 | 2.9115 |  |  |  |
| 工业金属 | 0.1618 | 0.4069 | -2.3218 | 0.1868 | 0.1365 | 0.0712 | 2.1842 |  |  |  |
| 银行 | -0.9272 | 1.0853 | -0.9601 | 0.7483 | -0.0237 | 0.0208 | 1.811 | -0.4926 | 0.4842 | -0.5768 |
| 航空装备 | 1.7816 | 0.4141 | -1.0724 | -1.3702 | -0.2661 | 0.4017 | 0.9156 |  |  |  |
| 房地产开发 | 0.0077 | 0.7448 | -1.4416 | -0.0226 | -0.3371 | 0.8564 | 2.2295 | -0.7162 | 1.0713 | -1.3234 |
| 仪器仪表 | 0.6722 | 1.0577 | -1.312 | -1.5409 | -0.3271 | 1.1278 | 1.6998 | 1.3042 | -0.0631 | -1.6378 |
| 光学光电子 | 0.4718 | 1.1809 | -2.4025 | 0.8662 | 0.1712 | 0.7335 | 0.4829 | 1.0673 | 0.4475 | -2.1091 |
| 汽车零部件 | 0.947 | 0.7642 | -1.8754 | -0.3987 | 0.2623 | 0.9485 | 1.9252 | 0.3656 | 0.0062 | -2.1122 |
| 水务 | 0.5644 | 0.1001 | -1.7048 | -0.1949 | -0.3739 | 0.0782 | 1.9604 | 1.5573 | 0.3456 | -1.5361 |
| 景点 | -0.3171 | 1.6989 | -0.5843 | -1.462 | -0.4503 | 1.3264 | 1.3403 | 0.1379 | -0.3634 | -0.5307 |
| 高低压设备 | 1.191 | 0.1323 | -1.7973 | -1.2682 | -0.048 | 0.9954 | 1.3311 |  |  |  |
| 家用轻工 | 0.9666 | 0.7126 | -2.3946 | -1.1622 | -0.2598 | 1.8175 | 1.166 | 1.2853 | 0.2449 | -1.6743 |
| 汽车整车 | 0.6195 | 0.1808 | -1.7309 | 0.3694 | -0.059 | 0.3369 | 1.4005 | 0.5477 | 0.552 | -1.5367 |
| 橡胶 | 0.9287 | 0.9454 | -1.8778 | -1.9448 | 0.0239 | 0.9211 | 1.5424 | 0.9076 | 0.2721 | -1.1824 |
| 物流 | 1.233 | 0.2437 | -2.0324 | -1.0381 | -0.73 | 1.3251 | 1.5168 | 0.823 | 0.3614 | -1.182 |
| 电气自动化设备 | 1.2671 | 0.739 | -1.5841 | -0.8719 | -0.0743 | 0.8999 | -0.0934 |  |  |  |
| 金属非金属新材料 | 0.5064 | 0.689 | -1.8136 | 0.7086 | -0.0224 | 0.6907 | 1.0379 | -0.3118 | 0.0513 | -1.2876 |
| 通信设备 | 0.3816 | 0.4612 | -1.2689 | -0.2615 | -0.3233 | 0.9937 | 1.2212 | 1.5941 | -0.7933 | -1.8558 |
| 塑料 | 1.2001 | 0.1239 | -3.0592 | -0.4442 | 0.3251 | 1.2916 | 1.2816 | 0.5811 | 0.3462 | -1.5009 |
| 化学原料 | 0.7798 | 0.5208 | -1.8773 | -0.9896 | 0.8527 | 0.8487 | 1.3914 | 0.0765 | -0.2957 | -1.2314 |
| 专用设备 | 1.2496 | 1.2737 | -1.7921 | -0.798 | -0.1636 | 0.477 | 1.6466 | -0.1099 | -0.0976 | -1.7105 |
| 电机 | 0.3415 | 0.2294 | -1.6832 | -0.7009 | -0.2122 | 1.0585 | 0.9286 |  |  |  |
| 券商 | 0.5447 | 0.7766 | -1.0699 | -0.9833 | -0.2811 | -0.5877 | 2.3595 | -0.1068 | 0.8083 | -1.5498 |
| 电力 | -0.0773 | 0.5913 | -1.2447 | -1.3441 | -0.6157 | 0.405 | 3.2374 | -0.2798 | 0.5516 | -1.3494 |
| 包装印刷 | 0.7068 | 0.4153 | -1.0617 | -1.729 | -0.2716 | 1.4147 | 0.8826 | 1.3072 | -0.2575 | -1.6566 |
| 通用机械 | 1.122 | 0.5076 | -1.9139 | -1.4596 | 0.035 | 0.9245 | 1.5599 | 0.8246 | -0.1079 | -1.8536 |
| 互联网传媒 | 1.2355 | 0.955 | -1.5216 | -1.5035 | -0.9032 | 1.1194 | 0.3601 |  |  |  |
| 农产品加工 | 2.7106 | 0.3901 | -2.1604 | -1.4426 | 0.2745 | 1.0414 | 1.1859 | 0.2615 | -0.5771 | -2.0591 |
| 金属制品 | 0.5536 | 0.1893 | -2.2016 | -0.1325 | 0.1738 | 0.906 | 1.0378 | 0.9315 | -0.0194 | -1.8748 |
| 种植业 | 1.825 | 0.2472 | -1.8237 | -1.3942 | 0.1877 | 0.3672 | 0.5327 | 0.6747 | 0.3054 | -1.5635 |
| 其他轻工制造 | -0.5198 | 0.3907 |  |  |  |  |  |  |  |  |
| 园区开发 | 0.293 | 0.1946 | -0.5985 | -1.6088 | -0.4154 | 0.6625 | 1.7212 | 0.4209 | 0.6475 | -1.9719 |
| 船舶制造 | 0.3878 | 0.634 | -1.7666 | -1.2292 | -0.4801 | 0.1543 | 1.7255 |  |  |  |
| 畜禽养殖 | 0.4636 | 0.857 | -0.3354 | -0.9359 | 0.1689 | 0.5722 | 0.9476 | 0.232 | 0.1634 | -3.0037 |
| 运输设备 | -0.7876 | -1.0339 | -1.8388 | 0.4906 | -0.44 | 0.0818 | 2.705 |  |  |  |
| 专业零售 | 0.8642 | 0.2631 | -1.4372 | -0.457 | -0.5627 | 0.6869 | -0.2069 |  |  |  |
| 贸易 | 0.1878 | 0.3988 | -1.7123 | -1.5438 | 0.0162 | 0.4868 | 1.9735 | 0.4592 | -0.2007 | -1.3071 |
| 通信运营 | -0.5035 | 0.4053 | -0.8971 | -0.7711 | 0.4708 | 0.4841 | 1.7519 | -0.2403 | -1.7315 | -0.2829 |
| 环保工程及服务 | 0.7299 | -0.3223 | -2.388 | -0.3528 | -0.0827 | 0.8129 | 0.4328 | 0.8614 | -0.2996 | -0.7493 |
| 公交 | 1.2128 | 0.2003 | -1.4267 | -2.3296 | -0.5384 | 0.7901 | 1.7648 | 0.6898 | -0.0616 | -1.8066 |
| 多元金融 | -0.4126 | 0.1416 | -1.8123 | -1.434 | -0.2298 | 0.4419 | 2.398 | 0.5403 | 0.0372 | -1.2581 |
| 餐饮 | 0.6966 | -0.5649 | -1.3238 | -1.8133 | 0.107 | 0.8982 | 0.6206 | 0.4713 | 0.6335 | -1.4297 |
| 商业物业经营 | 0.7764 | 0.1367 | -1.6687 | -3.0034 | -0.1502 | 0.8056 | 1.9056 |  |  |  |
| 农业综合 | -0.4685 | 0.4695 | -1.313 | -1.7327 | 0.7809 | 0.2589 | 0.5393 | 0.9042 | 0.013 | -1.1667 |
| 港口 | -0.2231 | 0.1637 | -1.7969 | 0.3705 | -0.7596 | 0.0706 | 1.7554 | 0.5303 | 0.1304 | -1.973 |
| 林业 | 0.4116 | -0.622 | -1.2444 | -1.5005 | -0.2507 | 0.3433 | 1.319 | 0.8788 | 0.723 | -2.006 |
| 纺织制造 | -0.1336 | 0.2711 | -1.9238 | -1.8784 | -0.024 | 1.0752 | 1.3105 | 0.6735 | -0.0172 | -1.3755 |
| 燃气 | -0.0678 | -0.3176 | -1.2025 | -1.0721 | -0.0092 | 0.1529 | 1.0536 | -0.2224 | 1.0401 | -1.4316 |
| 汽车服务 | 0.2296 | 0.0143 | -1.7294 | -0.8372 | -0.3634 | 0.7746 | 0.8069 | 0.6502 | 0.0171 | -1.74 |
| 装修装饰 | 0.6313 | 0.0427 | -1.886 | -0.9801 | -0.1124 | 0.6788 | 0.1003 |  |  |  |
| 高速公路 | -0.324 | 0.3503 | -1.6028 | -0.3465 | -0.3202 | 0.5671 | 2.2236 | -0.1568 | -0.0743 | -2.5488 |
| 航空运输 | -0.6766 | 0.4061 | -1.5494 | 1.2317 | -0.4945 | 0.5805 | 1.988 | -1.0754 | -0.4541 | -2.3643 |
| 钢铁 | -0.3188 | -0.2709 | -1.5697 | 0.5911 | -0.435 | 0.0479 | 2.1989 | -1.3598 | -0.3044 | -1.523 |
| 航运 | -0.1547 | 0.9405 | -1.6069 | -0.7442 | -0.6903 | 0.4891 | 1.9051 | -0.3202 | -0.1758 | -2.7109 |
| 服装家纺 | -0.1958 | 0.0856 | -1.814 | -2.0878 | -0.1298 | 1.248 | 1.6124 | 0.0128 | -0.5453 | -1.4397 |
| 园林工程 | -0.3001 | -0.6023 | -2.6438 | -0.0361 | 0.319 | 1.141 | -0.1583 |  |  |  |
| 铁路运输 | -1.6361 | -0.3044 | -1.2209 | 0.7064 | -0.3319 | -0.4226 | 1.2028 | 0.1391 | -0.8525 | -0.6561 |
| 石油化工 | -0.8873 | -0.2817 | -1.597 | -1.0152 | 0.389 | 0.0016 | 0.8982 | -0.3163 | 0.3142 | -1.1625 |
| 渔业 | 0.4622 | -0.4902 | -2.0303 | -1.966 | 0.0141 | 1.0943 | 0.2716 | -0.2969 | -0.1048 | -1.124 |
| 营销传播 | 0.0796 | 0.424 | -2.0675 | -1.5353 | -0.5167 | 1.0089 | -0.4811 |  |  |  |
| 其他采掘 | 0.2774 | 0.1322 | -2.1021 | -0.3536 | -0.4824 | 0.4749 | 0.9923 | -1.8778 | 0.2134 | -1.8244 |
| 煤炭开采 | -0.4159 | 0.2329 | -1.7417 | 0.368 | -0.0672 | -0.1899 | 1.0413 | -2.2751 | -0.1401 | -1.4204 |
| 采掘服务 | -1.0274 | 0.66 | -1.4624 | -1.4982 | -0.4191 | 0.1304 | 0.4139 | 1.6425 | 0.1116 | -3.6391 |
| 文化传媒 | 0.3217 | 0.065 | -1.8848 | -2.3256 | -0.8693 | 0.9316 | -0.1526 |  |  |  |
| 石油开采 | -1.786 | -0.8276 | -1.397 | -1.6808 | 0.2589 | -1.0215 | 1.2279 | -1.1667 | -1.0316 | -1.1516 |

**数据处理（by Excel）：**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ts\_code** | **name** | **average** | **std** | **Sharpe’s sharpe** |
| 801152.SI | 生物制品 | 0.78816 | 1.329742 | 0.5927 |
| 801711.SI | 水泥制造 | 0.780529 | 1.036267 | 0.7532 |
| 801124.SI | 食品加工 | 0.68127 | 1.079933 | 0.6308 |
| 801123.SI | 饮料制造 | 0.67698 | 1.402126 | 0.4828 |
| 801156.SI | 医疗服务 | 0.67061 | 1.051043 | 0.6380 |
| 801713.SI | 其他建材 | 0.658243 | 1.430043 | 0.4603 |
| 801111.SI | 白色家电 | 0.59109 | 1.077918 | 0.5484 |
| 801214.SI | 旅游综合 | 0.55042 | 0.866154 | 0.6355 |
| 801153.SI | 医疗器械 | 0.51757 | 1.394499 | 0.3712 |
| 801151.SI | 化学制药 | 0.49794 | 1.170082 | 0.4256 |
| 801174.SI | 机场 | 0.48802 | 0.91856 | 0.5313 |
| 801215.SI | 其他休闲服务 | 0.4379 | 0.88165 | 0.4967 |
| 801085.SI | 电子制造 | 0.41848 | 1.234582 | 0.3390 |
| 801018.SI | 动物保健 | 0.36328 | 1.274219 | 0.2851 |
| 801743.SI | 地面兵装 | 0.352629 | 0.860728 | 0.4097 |
| 801081.SI | 半导体 | 0.34966 | 1.320139 | 0.2649 |
| 801721.SI | 房屋建设 | 0.340457 | 1.04225 | 0.3267 |
| 801053.SI | 黄金 | 0.333443 | 0.834236 | 0.3997 |
| 801733.SI | 电源设备 | 0.310571 | 1.128424 | 0.2752 |
| 801712.SI | 玻璃制造 | 0.301086 | 1.107547 | 0.2718 |
| 801014.SI | 饲料 | 0.29619 | 0.997332 | 0.2970 |
| 801083.SI | 元件 | 0.29619 | 1.056722 | 0.2803 |
| 801194.SI | 保险 | 0.28642 | 1.177239 | 0.2433 |
| 801101.SI | 计算机设备 | 0.28397 | 1.029177 | 0.2759 |
| 801154.SI | 医药商业 | 0.26947 | 1.074854 | 0.2507 |
| 801724.SI | 专业工程 | 0.240886 | 1.192439 | 0.2020 |
| 801231.SI | 综合 | 0.233033 | 1.130903 | 0.2061 |
| 801054.SI | 稀有金属 | 0.231014 | 0.92074 | 0.2509 |
| 801082.SI | 其他电子 | 0.22487 | 1.173665 | 0.1916 |
| 801741.SI | 航天装备 | 0.209014 | 1.097226 | 0.1905 |
| 801032.SI | 化学纤维 | 0.20303 | 1.224429 | 0.1658 |
| 801222.SI | 计算机应用 | 0.2011 | 1.175557 | 0.1711 |
| 801203.SI | 一般零售 | 0.199486 | 1.124631 | 0.1774 |
| 801112.SI | 视听器材 | 0.15603 | 0.967753 | 0.1612 |
| 801213.SI | 酒店 | 0.14141 | 1.178634 | 0.1200 |
| 801034.SI | 化学制品 | 0.13512 | 1.0011 | 0.1350 |
| 801143.SI | 造纸 | 0.13436 | 1.011147 | 0.1329 |
| 801881.SI | 其他交运设备 | 0.131914 | 1.224128 | 0.1078 |
| 801155.SI | 中药 | 0.12822 | 0.908443 | 0.1411 |
| 801723.SI | 基础建设 | 0.120786 | 1.23631 | 0.0977 |
| 801055.SI | 工业金属 | 0.117943 | 1.213875 | 0.0972 |
| 801192.SI | 银行 | 0.11692 | 0.864473 | 0.1353 |
| 801742.SI | 航空装备 | 0.1149 | 1.024775 | 0.1121 |
| 801181.SI | 房地产开发 | 0.10688 | 1.083929 | 0.0986 |
| 801073.SI | 仪器仪表 | 0.09808 | 1.192714 | 0.0822 |
| 801084.SI | 光学光电子 | 0.09097 | 1.210161 | 0.0752 |
| 801093.SI | 汽车零部件 | 0.08327 | 1.198228 | 0.0695 |
| 801164.SI | 水务 | 0.07963 | 1.100127 | 0.0724 |
| 801212.SI | 景点 | 0.07957 | 0.979468 | 0.0812 |
| 801734.SI | 高低压设备 | 0.076614 | 1.133797 | 0.0676 |
| 801142.SI | 家用轻工 | 0.0702 | 1.331287 | 0.0527 |
| 801094.SI | 汽车整车 | 0.06802 | 0.92451 | 0.0736 |
| 801037.SI | 橡胶 | 0.05362 | 1.206637 | 0.0444 |
| 801178.SI | 物流 | 0.05205 | 1.164278 | 0.0447 |
| 801732.SI | 电气自动化设备 | 0.040329 | 0.943695 | 0.0427 |
| 801051.SI | 金属非金属新材料 | 0.02485 | 0.884806 | 0.0281 |
| 801102.SI | 通信设备 | 0.0149 | 1.059828 | 0.0141 |
| 801036.SI | 塑料 | 0.01453 | 1.309051 | 0.0111 |
| 801033.SI | 化学原料 | 0.00759 | 1.018594 | 0.0075 |
| 801074.SI | 专用设备 | -0.00248 | 1.137769 | -0.0022 |
| 801731.SI | 电机 | -0.00547 | 0.888113 | -0.0062 |
| 801193.SI | 券商 | -0.00895 | 1.098583 | -0.0081 |
| 801161.SI | 电力 | -0.01257 | 1.301431 | -0.0097 |
| 801141.SI | 包装印刷 | -0.02498 | 1.102541 | -0.0227 |
| 801072.SI | 通用机械 | -0.03614 | 1.212995 | -0.0298 |
| 801752.SI | 互联网传媒 | -0.0369 | 1.146624 | -0.0322 |
| 801012.SI | 农产品加工 | -0.03752 | 1.464289 | -0.0256 |
| 801075.SI | 金属制品 | -0.04363 | 1.072329 | -0.0407 |
| 801016.SI | 种植业 | -0.06415 | 1.098504 | -0.0584 |
| 801144.SI | 其他轻工制造 | -0.06455 | 0.45525 | -0.1418 |
| 801182.SI | 园区开发 | -0.06549 | 1.052904 | -0.0622 |
| 801744.SI | 船舶制造 | -0.08204 | 1.093402 | -0.0750 |
| 801017.SI | 畜禽养殖 | -0.08703 | 1.10538 | -0.0787 |
| 801076.SI | 运输设备 | -0.11756 | 1.348635 | -0.0872 |
| 801204.SI | 专业零售 | -0.12137 | 0.73859 | -0.1643 |
| 801202.SI | 贸易 | -0.12416 | 1.069908 | -0.1160 |
| 801223.SI | 通信运营 | -0.13143 | 0.911343 | -0.1442 |
| 801162.SI | 环保工程及服务 | -0.13577 | 0.923444 | -0.1470 |
| 801172.SI | 公交 | -0.15051 | 1.285265 | -0.1171 |
| 801191.SI | 多元金融 | -0.15878 | 1.14689 | -0.1384 |
| 801211.SI | 餐饮 | -0.17045 | 0.970834 | -0.1756 |
| 801205.SI | 商业物业经营 | -0.17114 | 1.536429 | -0.1114 |
| 801013.SI | 农业综合 | -0.17151 | 0.895466 | -0.1915 |
| 801171.SI | 港口 | -0.17317 | 1.048674 | -0.1651 |
| 801011.SI | 林业 | -0.19479 | 1.059076 | -0.1839 |
| 801131.SI | 纺织制造 | -0.20222 | 1.101442 | -0.1836 |
| 801163.SI | 燃气 | -0.20766 | 0.811414 | -0.2559 |
| 801092.SI | 汽车服务 | -0.21773 | 0.900244 | -0.2419 |
| 801722.SI | 装修装饰 | -0.21791 | 0.850967 | -0.2561 |
| 801175.SI | 高速公路 | -0.22324 | 1.196385 | -0.1866 |
| 801173.SI | 航空运输 | -0.2408 | 1.242853 | -0.1937 |
| 801041.SI | 钢铁 | -0.29437 | 1.068165 | -0.2756 |
| 801176.SI | 航运 | -0.30683 | 1.221906 | -0.2511 |
| 801132.SI | 服装家纺 | -0.32536 | 1.148086 | -0.2834 |
| 801725.SI | 园林工程 | -0.3258 | 1.077662 | -0.3023 |
| 801177.SI | 铁路运输 | -0.33762 | 0.808162 | -0.4178 |
| 801035.SI | 石油化工 | -0.3657 | 0.749573 | -0.4879 |
| 801015.SI | 渔业 | -0.417 | 0.966244 | -0.4316 |
| 801751.SI | 营销传播 | -0.44116 | 0.997983 | -0.4420 |
| 801022.SI | 其他采掘 | -0.45501 | 1.044555 | -0.4356 |
| 801021.SI | 煤炭开采 | -0.46081 | 0.980348 | -0.4700 |
| 801024.SI | 采掘服务 | -0.50878 | 1.40011 | -0.3634 |
| 801761.SI | 文化传媒 | -0.55914 | 1.103693 | -0.5066 |
| 801023.SI | 石油开采 | -0.8576 | 0.875582 | -0.9795 |

**4. 部分海外市场的夏普比率**

以美国、香港股市为例，选取纳斯达克指数、恒生指数和其他的几只股票进行计算：

import tushare as ts

import numpy as np

import pandas as pd

import math

from pandas\_datareader import data as web

lists\_1 = ['^IXIC','AAPL','MSFT','AMZN','GOOGL','TSLA','^HSI','0700.hk']

lists\_2 = ['BABA']

lists\_3 = ['FB']

lists = lists\_1+lists\_2+lists\_3

table = pd.DataFrame([], columns=['2020','2019','2018','2017','2016','2015','2014','2013','2012','2011'], index=lists)

for one in lists\_1:

for x in range(2020,2010,-1):

df = web.DataReader(name=one, data\_source='yahoo' , start=str(x)+'0101', end=str(x)+'1231')

a = np.log(df['Close']/df['Close'].shift(1))

sharpe = (a.mean()\*252-0.014)/(a.std()\* math.sqrt(252))

table[str(x)][one] = '%.4f' % sharpe

for one in lists\_2:

for x in range(2020,2014,-1):

df = web.DataReader(name=one, data\_source='yahoo' , start=str(x)+'0101', end=str(x)+'1231')

a = np.log(df['Close']/df['Close'].shift(1))

sharpe = (a.mean()\*252-0.014)/(a.std()\* math.sqrt(252))

table[str(x)][one] = '%.4f' % sharpe

for one in lists\_3:

for x in range(2020,2012,-1):

df = web.DataReader(name=one, data\_source='yahoo' , start=str(x)+'0101', end=str(x)+'1231')

a = np.log(df['Close']/df['Close'].shift(1))

sharpe = (a.mean()\*252-0.014)/(a.std()\* math.sqrt(252))

table[str(x)][one] = '%.4f' % sharpe

print(table)

table.to\_excel('C://Users//84695//Desktop//生活琐碎//quant//American stock market.xls')

**output：**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2020** | **2019** | **2018** | **2017** | **2016** | **2015** | **2014** | **2013** | **2012** | **2011** |
| **0700.hk** | 1.1833 | 0.7857 | -0.8365 | 3.2471 | 0.9319 | 0.9406 | 0.2868 | 2.4048 | 1.6126 | -0.3036 |
| **AMZN** | 2.0924 | 0.8435 | 0.612 | 2.0892 | 0.303 | 2.3393 | -0.8065 | 1.6706 | 1.053 | -0.1374 |
| **FB** | 0.7434 | 1.5675 | -0.8728 | 2.3604 | 0.2898 | 1.0895 | 0.9668 | 1.5943 |  |  |
| **^IXIC** | 0.7566 | 1.8355 | -0.3291 | 2.3783 | 0.3659 | 0.2472 | 0.7885 | 2.5327 | 0.7939 | -0.1271 |
| **AAPL** | 1.3928 | 2.3062 | -0.3571 | 2.0717 | 0.3487 | -0.2299 | 1.4112 | 0.1342 | 0.8401 | 0.8137 |
| **MSFT** | 0.8611 | 2.1419 | 0.545 | 2.0421 | 0.4374 | 0.5828 | 1.0673 | 1.2834 | -0.0784 | -0.368 |
| **TSLA** | 2.3038 | 0.4339 | 0.0412 | 0.9883 | -0.3332 | 0.1603 | 0.7886 | 2.2236 | 0.327 | 0.1108 |
| **GOOGL** | 0.3985 | 0.9905 | -0.1445 | 1.6675 | 0.0217 | 1.3112 | -0.3257 | 2.0938 | 0.2081 | 0.2384 |
| **BABA** | 0.6986 | 1.3994 | -0.8633 | 2.5312 | 0.2039 | -0.7688 |  |  |  |  |
| **^HSI** | -0.8094 | 0.6652 | -0.9374 | 2.6148 | 0.0965 | -0.4593 | -0.017 | -0.0934 | 1.0556 | -1.02 |

**数据处理（by Excel）：**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **average** | **std** | **sharpe's sharpe** |
| **0700.hk** | 1.0253 | 1.1428 | 0.8971 |
| **AMZN** | 1.0059 | 0.9921 | 1.0139 |
| **FB** | 0.9674 | 0.9086 | 1.0647 |
| **^IXIC** | 0.9242 | 0.9509 | 0.9720 |
| **AAPL** | 0.8732 | 0.8721 | 1.0012 |
| **MSFT** | 0.8515 | 0.7749 | 1.0987 |
| **TSLA** | 0.7044 | 0.8564 | 0.8225 |
| **GOOGL** | 0.6460 | 0.7797 | 0.8285 |
| **BABA** | 0.5335 | 1.1919 | 0.4476 |
| **^HSI** | 0.1096 | 1.0525 | 0.1041 |

从上表中我们可以看出，纳斯达克所代表的海外美股市场的表现优于A股市场。

**5. 不用tushare抓取股票信息的方法介绍——以贵州茅台为例：**

import numpy as np

import pandas as pd

import math

from pandas\_datareader import data as web

*lists = ['600519.ss']*

table = pd.DataFrame([], columns=['2020','2019','2018','2017','2016','2015','2014','2013','2012','2011'], index=lists)

for one in lists:

for x in range(2020,2010,-1):

df = web.DataReader(name=one, data\_source='yahoo' , start=str(x)+'0101', end=str(x)+'1231')

a = np.log(df['Close']/df['Close'].shift(1))

sharpe = (a.mean()\*252-0.014)/(a.std()\* math.sqrt(252))

table[str(x)][one] = '%.4f' % sharpe

print(table)

**以上list中的代码后缀的分类如下：**

上海交易所=cn.finance.yahoo.com, **SS**, Chinese

深圳交易所=cn.finance.yahoo.com,.**SZ**, Chinese

美国交易所=finance.yahoo.com, **无** , United States

加拿大=ca.finance.yahoo.com,.**TO**, Toronto

新西兰=au.finance.yahoo.com,.**NZ**

新加坡=sg.finance.yahoo.com,.**SI**, Singapore

香港=hk.finance.yahoo.com,.**HK**, Hong Kong

台湾=tw.finance.yahoo.com,.**TW**, Taiwan

印度=in.finance.yahoo.com,.**BO**, Bombay

伦敦=uk.finance.yahoo.com. **L**, London

澳洲=au.finance.yahoo.com,.**AX,** Sydney

巴西=br.finance.yahoo.com,.**SA**, Sao Paulo

瑞典=se.finance.yahoo.com,.**ST**, Stockholm

**二. 股池选股**

有了以上夏普比率的指导，我们发现在上证指数、深成指数、沪深300指数、恒生指数、纳斯达克指数这五个指数中，只有纳斯达克指数在过去十年间的表现一枝独秀，所以在指数投资方面，应该购买该支股指的基金。

而在个股选取方面，根据板块表现，我们应该重点选取一级板块中的**建筑材料**、**食品饮料**、家用电器、医药生物、休闲服务、非银金融（按顺序）这六个板块，以及二级板块中的**生物制品**、**水泥制造**、**食品加工**、**饮料制造**、**医疗服务**、**其他建材**、白色家电、旅游综合、医疗器械、化学制药、机场、其他休闲服务、电子制造（按顺序）这13个板块。在二级板块中，动物保健、地面兵装、半导体、房屋建设、黄金、电源设备、玻璃制造这7个板块也可给予适当地关注。

从二级产业的sharpe ratio表中，可以看出近十年sharpe ratio平均值领先的行业里，2020年表现不尽如人意（sharpe ratio < 1）的有三个：水泥制造、白色家电、机场（<0）。由于2020年年初的疫情，各行业都受到了极大的冲击，而机场在此次冲击中还没有恢复过来。

**1. 股池添加**

|  |  |
| --- | --- |
| **生物制品** | 长春高新、沃森生物、我武生物、天坛生物、华兰生物、博雅生物、康泰生物、复星医药、通化东宝、双成药业、辽宁成大、常山药业、中源协和、康辰药业、特宝生物、华熙生物 |
| **水泥制造** |  |
| **食品加工** |  |
| **饮料制造** |  |
| **医疗服务** |  |
| **其他建材** |  |
| **白色家电** |  |
| **旅游综合** |  |
| **医疗器械** |  |
| **化学制药** |  |
| **机场** |  |
| **其他休闲服务** |  |
| **电子制造** |  |