

# Stock\_Active\_Risk\_Chart

September 29, 2021

## 1 Stock Active Risk Chart

```
[1]: # Library
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

import warnings
warnings.filterwarnings("ignore")

from pandas_datareader import data as pdr
import yfinance as yf
yf.pdr_override()

[2]: start = '2019-01-01' #input
end = '2020-07-01' #input
symbol1 = '^GSPC' #input
symbol2 = 'AMD' #input

[3]: market = yf.download(symbol1, start=start, end=end)['Adj Close']
stocks = yf.download(symbol2, start=start, end=end)['Adj Close']

[*****100%*****] 1 of 1 completed
[*****100%*****] 1 of 1 completed

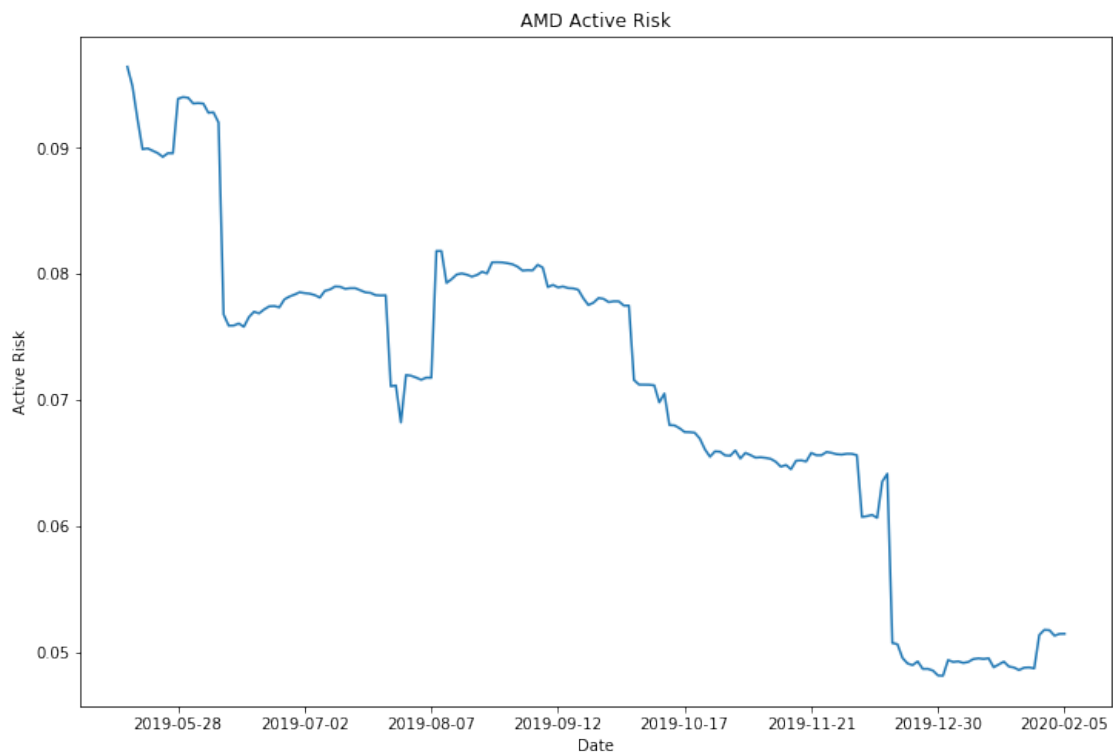
[4]: market_returns = market.pct_change().dropna()
stocks_returns = stocks.pct_change().dropna()

[5]: def active_risk(stock_returns, market_returns):
    N = 14
    ar = np.sqrt((sum((stock_returns - market_returns)**2)/(N-1)))
    return ar

[6]: # Compute the running Active Risk
running = [active_risk(stocks_returns[i-90:i], market_returns[i-90:i]) for i in
↳ range(90, len(stocks_returns))]
```

```
# Plot running Active Risk up to 100 days before the end of the data set
_, ax1 = plt.subplots(figsize=(12,8))
ax1.plot(range(90, len(stocks_returns)-100), running[: -100])
ticks = ax1.get_xticks()
ax1.set_xticklabels([stocks.index[int(i)].date() for i in ticks[: -1]]) # Label
    ↪ x-axis with dates
plt.title(symbol2 + ' Active Risk')
plt.xlabel('Date')
plt.ylabel('Active Risk')
```

```
[6]: Text(0, 0.5, 'Active Risk')
```



```
[7]: stock_ar = active_risk(stocks_returns, market_returns)
      stock_ar
```

```
[7]: 0.15587056702303861
```

```
[8]: running = [active_risk(stocks_returns[i-90:i], market_returns[i-90:i]) for i in
    ↪range(90, len(stocks_returns))]
running
```

[8]: [0.09642247417732748,  
0.09490680937231001,  
0.09228011026935604,  
0.08988425103269004,  
0.08994932651331626,  
0.08976348795102822,  
0.08957369147112465,  
0.08927107920170496,  
0.08956606417455906,  
0.08956258185010964,  
0.09388341032237593,  
0.09401887757123836,  
0.09396231747461573,  
0.09350744077037139,  
0.09354049753947141,  
0.09350120329515185,  
0.0927723819849101,  
0.09280567144782974,  
0.0920035803678545,  
0.0767793518845296,  
0.07588889416888145,  
0.07589668123489188,  
0.0760608136340825,  
0.07579565261740219,  
0.07656906325827612,  
0.07698921772377147,  
0.07686074319116411,  
0.07717579872448933,  
0.07741672039501714,  
0.07744123589395226,  
0.07733947997271841,  
0.07797085960549403,  
0.07819650184431166,  
0.07835052931737871,  
0.07853745307058492,  
0.07846842270331603,  
0.07842598084623874,  
0.07830812556948757,  
0.07811455153902297,  
0.07865015050356947,  
0.07875699501638109,  
0.07899391179152823,  
0.07897209346383226,  
0.07880695900333069,  
0.07885950166314427,  
0.07885933151268988,  
0.0786872734420647,

0.07852579229310648,  
0.07848801868789214,  
0.07830491223004918,  
0.07827908105787822,  
0.0782932851369264,  
0.07107741479427188,  
0.07114740247598089,  
0.06820679951572275,  
0.07196800209992,  
0.07191579340403904,  
0.07176765251076826,  
0.07159446108037255,  
0.07176394619433862,  
0.07175254805996087,  
0.08180787542620305,  
0.08180509951649598,  
0.07927035594078137,  
0.07957295072635548,  
0.0799427859832169,  
0.08002910924316926,  
0.07993161964672625,  
0.07977537510156102,  
0.07990118615828183,  
0.08016056699515443,  
0.08002655514355937,  
0.08090959743511025,  
0.08091729579173398,  
0.08090392825088491,  
0.08084187219042675,  
0.08075474894446302,  
0.0805696982364073,  
0.08025525445994763,  
0.08029090114710423,  
0.08027196277646978,  
0.0807191708624282,  
0.08048618189922029,  
0.07894111035685382,  
0.07912218672338626,  
0.07891762178936325,  
0.0789909066121326,  
0.07886651843563637,  
0.07884275673255697,  
0.07873659948581722,  
0.07805994124663053,  
0.07752138385392576,  
0.07770760060623629,  
0.07807638772110811,

0.0780157793883349,  
0.07775298071893494,  
0.07781688291127634,  
0.07781380423687029,  
0.07747801527398578,  
0.07747913947651482,  
0.07157406353046966,  
0.07121005725582032,  
0.07120197131648878,  
0.07119923696928823,  
0.07115627983891354,  
0.06979876862071212,  
0.07050220236092751,  
0.06800558768387015,  
0.06797686378342316,  
0.06774917411822548,  
0.06744841000238128,  
0.0674351666236358,  
0.06739389376401325,  
0.06692825026403357,  
0.0660757261849656,  
0.06548892736721114,  
0.06591898038706576,  
0.06588522069359003,  
0.06559687821459241,  
0.06556625029376995,  
0.0659877169237496,  
0.0653469205797465,  
0.06579879498280203,  
0.06561764384112706,  
0.06541785739091185,  
0.06544515829018191,  
0.06539767624887938,  
0.06532021872756097,  
0.06508798025054942,  
0.06469673676960327,  
0.06483577004493195,  
0.06449927409335282,  
0.06517413651198625,  
0.06519908679129847,  
0.06511811431194572,  
0.06579869257062404,  
0.0656075492408111,  
0.0656092767265271,  
0.06586619975785477,  
0.06579835907836336,  
0.06569046006704034,

0.06565887776305503,  
0.06572478079868449,  
0.0657202839032021,  
0.06560796095258899,  
0.060713825001327014,  
0.060778773485564055,  
0.06087713182729551,  
0.06063996285959449,  
0.06351476052650394,  
0.06413801363674446,  
0.050713007380353614,  
0.05062141554899762,  
0.049529187338482605,  
0.04909253505242104,  
0.048960512981815384,  
0.049254597308916154,  
0.0486605853940524,  
0.04866377211581127,  
0.04852958569542285,  
0.04814200298175277,  
0.04812123684764043,  
0.04936038811885749,  
0.04921356614692402,  
0.0492615093742228,  
0.049136222850046846,  
0.04921654945108022,  
0.04944632147799784,  
0.04950044646400354,  
0.049454247078267684,  
0.04950770572825885,  
0.04878866929077581,  
0.04900692450196343,  
0.04923706839887382,  
0.0488498795981697,  
0.04877212885762257,  
0.04856865539792555,  
0.048757238954776135,  
0.048779493427431056,  
0.04869769349232799,  
0.051350814613815174,  
0.0517593723250281,  
0.05173228012691393,  
0.05129702941080244,  
0.05143851596221228,  
0.05144697346811332,  
0.05128521149174921,  
0.05141188581575852,

0.05279795908567704,  
0.05335348909390358,  
0.053351294265683046,  
0.05347736060971643,  
0.053586788305388516,  
0.05424082814011603,  
0.05490123125593789,  
0.05523932920717875,  
0.05668609247290855,  
0.05751052713491767,  
0.05750229810600519,  
0.05748898567188421,  
0.05801148559233374,  
0.05914833340259363,  
0.058663839900565944,  
0.0586719948345264,  
0.059208639251949004,  
0.05917257909966645,  
0.05916881485302847,  
0.05951176182131333,  
0.05928418266232957,  
0.06127929869552565,  
0.062454957702721636,  
0.06288940010863442,  
0.06207442496736569,  
0.06236746025867501,  
0.06246108811904235,  
0.06253783508947776,  
0.06342048801883308,  
0.06723609290551379,  
0.06733435500018323,  
0.06827265691765716,  
0.06801898911097108,  
0.06813204601045968,  
0.06750752857163321,  
0.06741884241482096,  
0.06742051902841498,  
0.0667644582435953,  
0.06712465804993809,  
0.06825264674498077,  
0.06797519180880127,  
0.06798855555998624,  
0.06828056799681065,  
0.07047971291981411,  
0.07164817497349238,  
0.07182996969229134,  
0.07229907139638875,

0.07283232293630325,  
0.07303586893318402,  
0.07378603611252778,  
0.07437534419978091,  
0.07176119946816352,  
0.07118610559655639,  
0.07096963811803948,  
0.07099929548758534,  
0.07285898329103617,  
0.07293486483276287,  
0.07278946609348888,  
0.07363967224709247,  
0.0734748835488798,  
0.07349101246842597,  
0.07356812108737165,  
0.07355584831267449,  
0.0747308981636387,  
0.07282707436894886,  
0.07289701707808571,  
0.07344148240808938,  
0.07348986104034642,  
0.0737018353545519,  
0.07391688068641428,  
0.07382225221427197,  
0.07408601810008311,  
0.07406516875403923,  
0.07524714525906737,  
0.07538060470059084,  
0.07533258408773731,  
0.07594281281196573,  
0.07594107765300888,  
0.07598121659780274,  
0.07624918840175872,  
0.07623261532861189,  
0.07625848223509035,  
0.07459656505724219,  
0.07697159898128655,  
0.07708142602699368,  
0.07720384478765006,  
0.0770947343703056,  
0.07718327496537838,  
0.07735203717918288,  
0.07727220174612494,  
0.07637223012525536,  
0.07602511050895162,  
0.07601894010155327,  
0.07609731377258036,



0.07602602686129009,  
0.07572100412195501,  
0.07530505781411997,  
0.07507682986426527]