# Using Excel for Optimizing Blended Strategies

AAII CIMI 9-2025

# How to optimize blends with Excel

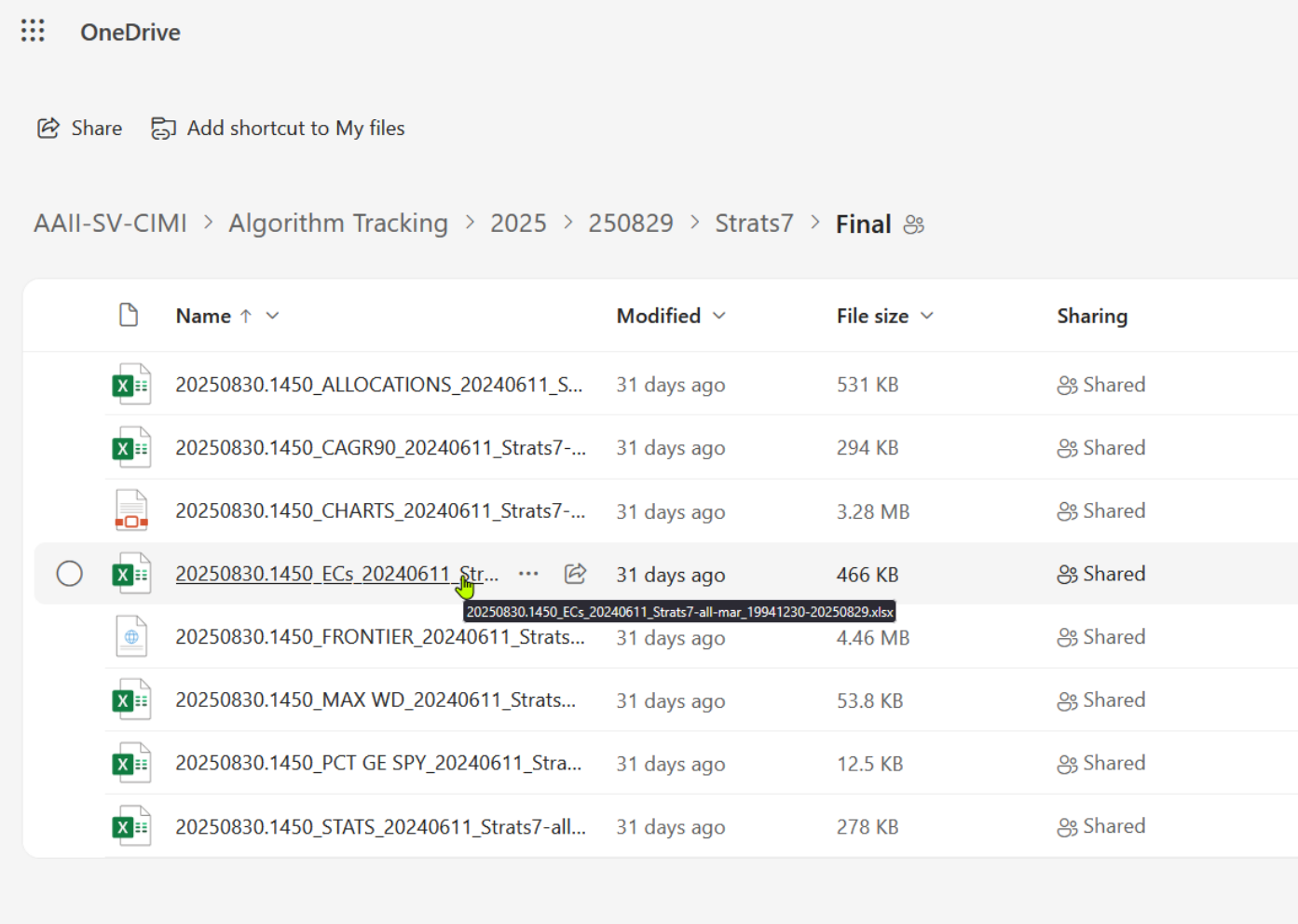
*--The steps in a nutshell --*

1. Navigate to the Algorithm Tracking folder and find the data for the strategies you want to test.
2. Download a copy and trim away the stuff you don't need
3. Add fields to calculate the blended portfolio and summary statistics
4. Open Solver within Excel and enter in the relevant constraints
5. Use Solver to find the blend with the best characteristics for your risk/return preferences.

# A simple example

- Just three strategies
  - SB041 – a high return, high drawdown strategy using Mix3x5 universe
    - 72% CAGR and 44% Max DD since 1994
  - SB029 – a modest return, low drawdown strategy using Fidelity sectors
    - 20% CAGR and 19% Max DD
  - S398 – the strategy of non-equity assets that is usually used when the timer tells us to be “risk-off”
    - 13% CAGR and 23% Max DD
- Just 24 months of data  - a real-world test requires periods of protracted bear market.
- This is way too short a time period for real-world insights; it is solely to demonstrate the mechanics.

# Navigate to the Algorithm Tracking folder and find the strategy you want to work with.

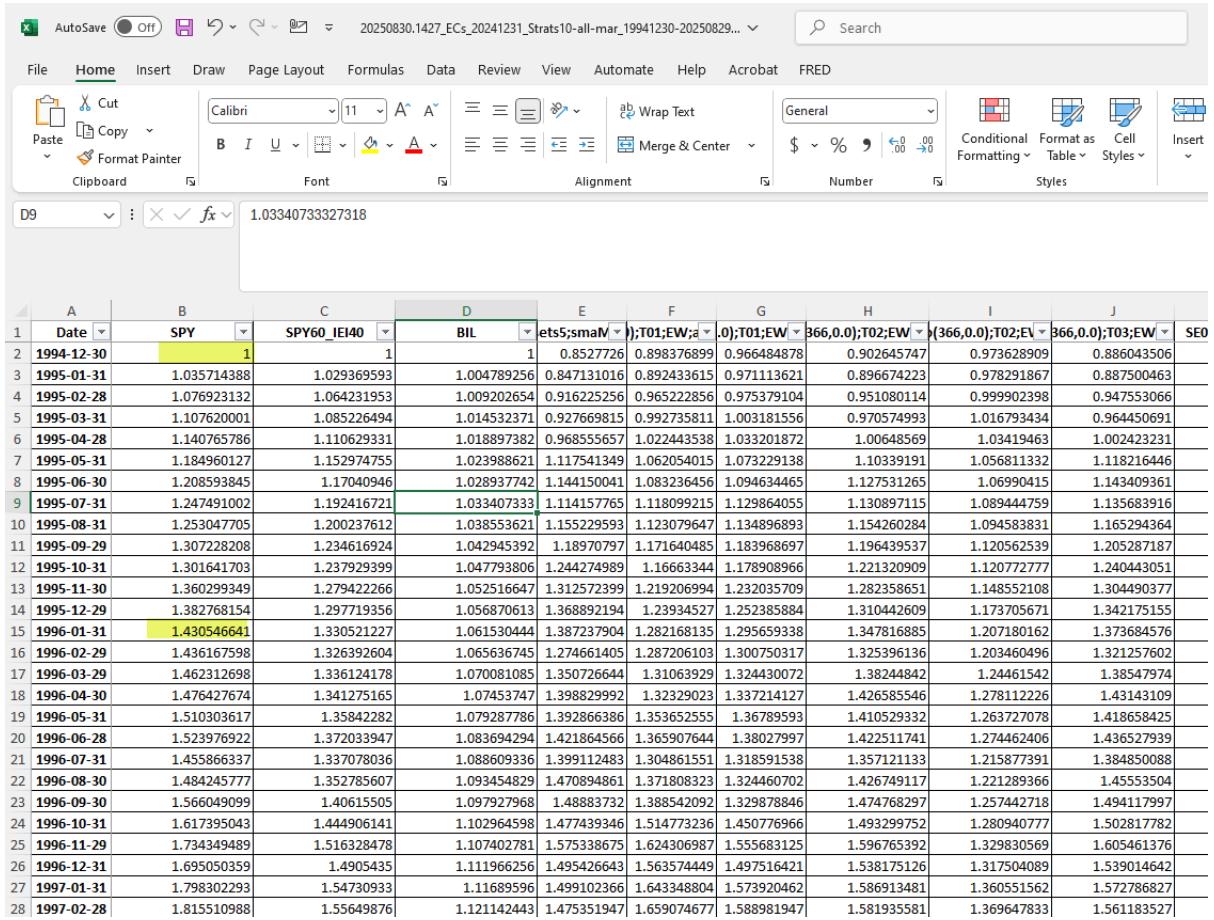



Go into the CIMI folder, into algorithm tracking, the current date, and the set of strategies you are interested in.

Find the excel file with “EC” in the title, which stands for for “Equity Curve”

Open it.

# Download a copy




| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | SPY | SPY60_IEI40 | BIL | ets5;smaM | );T01;EW;a | .0);T01;EW | 366,0.0);T02;EW | (366,0.0);T02;E | 366,0.0);T03;EW |
| 2 | 1994-12-30 | 1 | 1 | 1 | 0.8527726 | 0.898376899 | 0.966484878 | 0.902645747 | 0.973628909 | 0.886043506 |
| 3 | 1995-01-31 | 1.035714388 | 1.029369593 | 1.004789256 | 0.847131016 | 0.892433615 | 0.971113621 | 0.896674223 | 0.978291867 | 0.887500463 |
| 4 | 1995-02-28 | 1.076923132 | 1.064231953 | 1.009202654 | 0.916225256 | 0.965222856 | 0.975379104 | 0.951080114 | 0.999902398 | 0.947553066 |
| 5 | 1995-03-31 | 1.107620001 | 1.085226494 | 1.014532371 | 0.927669815 | 0.992735811 | 1.003181556 | 0.970574993 | 1.016793434 | 0.964450691 |
| 6 | 1995-04-28 | 1.140765786 | 1.110629331 | 1.018897382 | 0.968555657 | 1.022443538 | 1.033201872 | 1.00648569 | 1.03419463 | 1.002423231 |
| 7 | 1995-05-31 | 1.184960127 | 1.152974755 | 1.023988621 | 1.117541349 | 1.062054015 | 1.073229138 | 1.10339191 | 1.056811332 | 1.118216446 |
| 8 | 1995-06-30 | 1.208593845 | 1.17040946 | 1.028937742 | 1.144150041 | 1.083236456 | 1.094634465 | 1.127531265 | 1.06990415 | 1.143409361 |
| 9 | 1995-07-31 | 1.247491002 | 1.192416721 | 1.033407333 | 1.114157765 | 1.118099215 | 1.129864055 | 1.130897115 | 1.089444759 | 1.135683916 |
| 10 | 1995-08-31 | 1.253047705 | 1.200237612 | 1.038553621 | 1.155229593 | 1.123079647 | 1.134896893 | 1.154260284 | 1.094583831 | 1.165294364 |
| 11 | 1995-09-29 | 1.307228208 | 1.234616924 | 1.042945392 | 1.18970797 | 1.171640485 | 1.183968697 | 1.196439537 | 1.120562539 | 1.205287187 |
| 12 | 1995-10-31 | 1.301641703 | 1.237929399 | 1.047793806 | 1.244274989 | 1.16663344 | 1.178908966 | 1.221320909 | 1.120772777 | 1.240443051 |
| 13 | 1995-11-30 | 1.360299349 | 1.279422266 | 1.052516647 | 1.312572399 | 1.219206994 | 1.232035709 | 1.282358651 | 1.148552108 | 1.304490377 |
| 14 | 1995-12-29 | 1.382768154 | 1.297719356 | 1.056870613 | 1.368892194 | 1.23934527 | 1.252385884 | 1.310442609 | 1.173705671 | 1.342175155 |
| 15 | 1996-01-31 | 1.430546641 | 1.330521227 | 1.061530444 | 1.387237904 | 1.282168135 | 1.295659338 | 1.347816885 | 1.207180162 | 1.373684576 |
| 16 | 1996-02-29 | 1.436167598 | 1.326392604 | 1.065636745 | 1.274661405 | 1.287206103 | 1.300750317 | 1.325396136 | 1.203460496 | 1.321257602 |
| 17 | 1996-03-29 | 1.462312698 | 1.336124178 | 1.070081085 | 1.350726644 | 1.31063929 | 1.324430072 | 1.38244842 | 1.24461542 | 1.38547974 |
| 18 | 1996-04-30 | 1.476427674 | 1.341275165 | 1.07453747 | 1.398829992 | 1.32329023 | 1.337214127 | 1.426585546 | 1.278112226 | 1.43143109 |
| 19 | 1996-05-31 | 1.510303617 | 1.35842282 | 1.079287786 | 1.392866386 | 1.353652555 | 1.36789593 | 1.410529332 | 1.263727078 | 1.418658425 |
| 20 | 1996-06-28 | 1.523976922 | 1.372033947 | 1.083694294 | 1.421864566 | 1.365907644 | 1.38027997 | 1.422511741 | 1.274462406 | 1.436527939 |
| 21 | 1996-07-31 | 1.455866337 | 1.337078036 | 1.088609336 | 1.399112483 | 1.304861551 | 1.318591538 | 1.357121133 | 1.215877391 | 1.384850088 |
| 22 | 1996-08-30 | 1.484245777 | 1.352785607 | 1.093454829 | 1.470894861 | 1.371808323 | 1.324460702 | 1.426749117 | 1.221289366 | 1.45553504 |
| 23 | 1996-09-30 | 1.566049099 | 1.40615505 | 1.097927968 | 1.48883732 | 1.388542092 | 1.329878846 | 1.474768297 | 1.257442718 | 1.494117997 |
| 24 | 1996-10-31 | 1.617395043 | 1.444906141 | 1.102964598 | 1.477439346 | 1.514773236 | 1.450776966 | 1.493299752 | 1.280940777 | 1.502817782 |
| 25 | 1996-11-29 | 1.734349489 | 1.516328478 | 1.107402781 | 1.575338675 | 1.624306987 | 1.555683125 | 1.596765392 | 1.329830569 | 1.605461376 |
| 26 | 1996-12-31 | 1.695050359 | 1.4905435 | 1.111966256 | 1.495426643 | 1.563574449 | 1.497516421 | 1.538175126 | 1.317504089 | 1.539014642 |
| 27 | 1997-01-31 | 1.798302293 | 1.54730933 | 1.11689596 | 1.499102366 | 1.643348804 | 1.573920462 | 1.586913481 | 1.360551562 | 1.572786827 |
| 28 | 1997-02-28 | 1.815510988 | 1.55649876 | 1.121142443 | 1.475351947 | 1.659074677 | 1.588981947 | 1.581935581 | 1.369647833 | 1.561183527 |

- This file shows the equity curve for each strategy in the collection, normalized to 1 as a starting point.
- Each row is one month.
- Each column is one strategy.

- For example, on 12/30/1994 your portfolio in SPY is assumed to be $1.
- On 1/31/96, your portfolio in SPY has increased to $1.43.
- These are total return figures adjusted for dividends and splits

# Delete or hide everything but the strategies and models you are interested in.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Date | S398 | SB029 | SB041 | |
| 2 | 2022-12-30 | 25.72892693 | 240.6642546 | 2439911.9 | |
| 3 | 2023-01-31 | 27.21072351 | 255.114668 | 2610873.362 | |
| 4 | 2023-02-28 | 25.75016208 | 246.8843742 | 2792566.428 | |
| 5 | 2023-03-31 | 26.098025 | 244.0104399 | 3447282.913 | |
| 6 | 2023-04-28 | 26.32308082 | 241.2019638 | 3591747.515 | |
| 7 | 2023-05-31 | 25.96982858 | 254.4556774 | 4566278.952 | |
| 8 | 2023-06-30 | 25.39294267 | 267.7003333 | 5327841.47 | |
| 9 | 2023-07-31 | 26.08898519 | 279.3702918 | 5856974.972 | |
| 10 | 2023-08-31 | 25.374145 | 270.2603874 | 5482483.351 | |
| 11 | 2023-09-29 | 24.22440114 | 259.2097681 | 4831002.966 | |
| 12 | 2023-10-31 | 23.78766291 | 250.6222486 | 5268337.83 | |
| 13 | 2023-11-30 | 24.38981751 | 266.1088363 | 5670412.109 | |
| 14 | 2023-12-29 | 26.11031475 | 280.4119928 | 6474359.492 | |
| 15 | 2024-01-31 | 25.56648889 | 276.7678623 | 6906946.684 | |
| 16 | 2024-02-29 | 25.79547342 | 293.7250304 | 9978299.571 | |
| 17 | 2024-03-28 | 26.34034331 | 301.9512035 | 11213124.17 | |
| 18 | 2024-04-30 | 27.12778651 | 286.0859291 | 9962188.625 | |
| 19 | 2024-05-31 | 27.56696414 | 303.0358765 | 13066330.3 | |
| 20 | 2024-06-28 | 27.52983129 | 308.0657621 | 15224293.91 | |
| 21 | 2024-07-31 | 29.00741119 | 309.9800525 | 13816435.93 | |
| 22 | 2024-08-30 | 29.61431996 | 317.5127756 | 12823976.71 | |
| 23 | 2024-09-30 | 31.12134942 | 322.8416414 | 14132533.02 | |
| 24 | 2024-10-31 | 32.45936657 | 324.815136 | 12812142.48 | |
| 25 | 2024-11-29 | 31.4452919 | 356.2811943 | 13315148.08 | |
| 26 | 2024-12-31 | 31.00227454 | 337.6009802 | 15255881.52 | |
| 27 | | | | | |
| 28 | | | | | |
| 29 | | | | | |

- I deleted all columns except the three strategies of interest.
- I deleted all dates except for a two year sample.
- I changed Strategy names to the shorthand form SB029 etc. so they don’t truncate.

# Now, add rows and columns

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | S398 | | | SB029 | | | SB041 | | | Composite | | |
| 2 | | EC | Mo Return | DD % | EC | Mo Return | DD % | EC | Mo Return | DD % | EC | Mo Return | DD % |
| 3 | 2022-12-30 | 25.73 | | | 240.66 | | | 2,439,912 | | | | | |
| 4 | 2023-01-31 | 27.21 | 1.058 | 0.0% | 255.11 | 1.060 | 0.0% | 2,610,873 | 1.070 | 0.0% | | #DIV/0! | #DIV/0! |
| 5 | 2023-02-28 | 25.75 | 0.946 | 5.4% | 246.88 | 0.968 | 3.2% | 2,792,566 | 1.070 | 0.0% | | #DIV/0! | #DIV/0! |
| 6 | 2023-03-31 | 26.10 | 1.014 | 4.1% | 244.01 | 0.988 | 4.4% | 3,447,283 | 1.234 | 0.0% | | #DIV/0! | #DIV/0! |
| 7 | 2023-04-28 | 26.32 | 1.009 | 3.3% | 241.20 | 0.988 | 5.5% | 3,591,748 | 1.042 | 0.0% | | #DIV/0! | #DIV/0! |
| 8 | 2023-05-31 | 25.97 | 0.987 | 4.6% | 254.46 | 1.055 | 0.3% | 4,566,279 | 1.271 | 0.0% | | #DIV/0! | #DIV/0! |
| 9 | 2023-06-30 | 25.39 | 0.978 | 6.7% | 267.70 | 1.052 | 0.0% | 5,327,841 | 1.167 | 0.0% | | #DIV/0! | #DIV/0! |
| 10 | 2023-07-31 | 26.09 | 1.027 | 4.1% | 279.37 | 1.044 | 0.0% | 5,856,975 | 1.099 | 0.0% | | #DIV/0! | #DIV/0! |
| 11 | 2023-08-31 | 25.37 | 0.973 | 6.7% | 270.26 | 0.967 | 3.3% | 5,482,483 | 0.936 | 6.4% | | #DIV/0! | #DIV/0! |
| 12 | 2023-09-29 | 24.22 | 0.955 | 11.0% | 259.21 | 0.959 | 7.2% | 4,831,003 | 0.881 | 17.5% | | #DIV/0! | #DIV/0! |
| 13 | 2023-10-31 | 23.79 | 0.982 | 12.6% | 250.62 | 0.967 | 10.3% | 5,268,338 | 1.091 | 10.1% | | #DIV/0! | #DIV/0! |
| 14 | 2023-11-30 | 24.39 | 1.025 | 10.4% | 266.11 | 1.062 | 4.7% | 5,670,412 | 1.076 | 3.2% | | #DIV/0! | #DIV/0! |
| 15 | 2023-12-29 | 26.11 | 1.071 | 4.0% | 280.41 | 1.054 | 0.0% | 6,474,359 | 1.142 | 0.0% | | #DIV/0! | #DIV/0! |
| 16 | 2024-01-31 | 25.57 | 0.979 | 6.0% | 276.77 | 0.987 | 1.3% | 6,906,947 | 1.067 | 0.0% | | #DIV/0! | #DIV/0! |
| 17 | 2024-02-29 | 25.80 | 1.009 | 5.2% | 293.73 | 1.061 | 0.0% | 9,978,300 | 1.445 | 0.0% | | #DIV/0! | #DIV/0! |
| 18 | 2024-03-28 | 26.34 | 1.021 | 3.2% | 301.95 | 1.028 | 0.0% | 11,213,124 | 1.124 | 0.0% | | #DIV/0! | #DIV/0! |
| 19 | 2024-04-30 | 27.13 | 1.030 | 0.3% | 286.09 | 0.947 | 5.3% | 9,962,189 | 0.888 | 11.2% | | #DIV/0! | #DIV/0! |
| 20 | 2024-05-31 | 27.57 | 1.016 | 0.0% | 303.04 | 1.059 | 0.0% | 13,066,330 | 1.312 | 0.0% | | #DIV/0! | #DIV/0! |
| 21 | 2024-06-28 | 27.53 | 0.999 | 0.1% | 308.07 | 1.017 | 0.0% | 15,224,294 | 1.165 | 0.0% | | #DIV/0! | #DIV/0! |
| 22 | 2024-07-31 | 29.01 | 1.054 | 0.0% | 309.98 | 1.006 | 0.0% | 13,816,436 | 0.908 | 9.2% | | #DIV/0! | #DIV/0! |
| 23 | 2024-08-30 | 29.61 | 1.021 | 0.0% | 317.51 | 1.024 | 0.0% | 12,823,977 | 0.928 | 15.8% | | #DIV/0! | #DIV/0! |
| 24 | 2024-09-30 | 31.12 | 1.051 | 0.0% | 322.84 | 1.017 | 0.0% | 14,132,533 | 1.102 | 7.2% | | #DIV/0! | #DIV/0! |
| 25 | 2024-10-31 | 32.46 | 1.043 | 0.0% | 324.82 | 1.006 | 0.0% | 12,812,142 | 0.907 | 15.8% | | #DIV/0! | #DIV/0! |
| 26 | 2024-11-29 | 31.45 | 0.969 | 3.1% | 356.28 | 1.097 | 0.0% | 13,315,148 | 1.039 | 12.5% | | #DIV/0! | #DIV/0! |
| 27 | 2024-12-31 | 31.00 | 0.986 | 4.5% | 337.60 | 0.948 | 5.2% | 15,255,882 | 1.146 | 0.0% | | #DIV/0! | #DIV/0! |
| 28 | | | | | | | | | | | | | |
| 29 | CAGR | 9.8% | | | 18.4% | | | 150.1% | | | #DIV/0! | | |
| 30 | Mean | | 0.83% | | | 1.51% | | | 8.79% | | | #DIV/0! | |
| 31 | MAX DD | | | 12.6% | | | 10.3% | | | 17.5% | | | #DIV/0! |
| 32 | MAR | | 0.78 | | | 1.79 | | | 8.57 | | | #DIV/0! | |
| 33 | | | | | | | | | | | | | |

- Add columns C, F, I to derive monthly return from the equity curve
- Add columns D, G, J to calculate drawdown and maxDD
- Add columns K, L, M to track a weighted average portfolio
- Add rows at the bottom for summary statistics
  - MAR = CAGR/MAX DD
- You can organize your spreadsheet to focus on Sharpe, UPI or any other measure of risk-adjusted return.
- Color-code headers and create sub heads as shown so it is easier to read

*Keep in mind, the real long term max DD on SB041 is 44% and the MAR is 2.19 much less than the 8.57 shown here.*

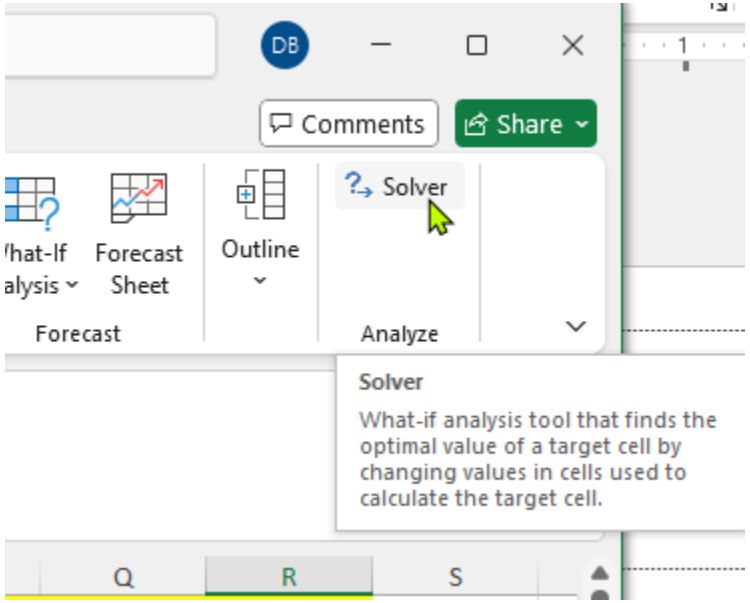
# Create a section on the right to set coefficients for how much exposure to each of the strategies.

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | S398 | | | SB029 | | | SB041 | | | Composite | | |
| 2 | | EC | Mo Return | DD % | EC | Mo Return | DD % | EC | Mo Return | DD % | EC | Mo Return | DD % |
| 3 | 2022-12-30 | 25.73 | | | 240.66 | | | 2,439,912 | | | 1 | | |
| 4 | 2023-01-31 | 27.21 | 1.058 | 0.0% | 255.11 | 1.060 | 0.0% | 2,610,873 | 1.070 | 0.0% | 1.0633 | 1.063 | 0.0% |
| 5 | 2023-02-28 | 25.75 | 0.946 | 5.4% | 246.88 | 0.968 | 3.2% | 2,792,566 | 1.070 | 0.0% | 1.0655 | 1.002 | 0.0% |
| 6 | 2023-03-31 | 26.10 | 1.014 | 4.1% | 244.01 | 0.988 | 4.4% | 3,447,283 | 1.234 | 0.0% | 1.1660 | 1.094 | 0.0% |
| 7 | 2023-04-28 | 26.32 | 1.009 | 3.3% | 241.20 | 0.988 | 5.5% | 3,591,748 | 1.042 | 0.0% | 1.1846 | 1.016 | 0.0% |
| 8 | 2023-05-31 | 25.97 | 0.987 | 4.6% | 254.46 | 1.055 | 0.3% | 4,566,279 | 1.271 | 0.0% | 1.3279 | 1.121 | 0.0% |
| 9 | 2023-06-30 | 25.39 | 0.978 | 6.7% | 267.70 | 1.052 | 0.0% | 5,327,841 | 1.167 | 0.0% | 1.4283 | 1.076 | 0.0% |
| 10 | 2023-07-31 | 26.09 | 1.027 | 4.1% | 279.37 | 1.044 | 0.0% | 5,856,975 | 1.099 | 0.0% | 1.5155 | 1.061 | 0.0% |
| 11 | 2023-08-31 | 25.37 | 0.973 | 6.7% | 270.26 | 0.967 | 3.3% | 5,482,483 | 0.936 | 6.4% | 1.4495 | 0.956 | 4.4% |
| 12 | 2023-09-29 | 24.22 | 0.955 | 11.0% | 259.21 | 0.959 | 7.2% | 4,831,003 | 0.881 | 17.5% | 1.3431 | 0.927 | 11.4% |
| 13 | 2023-10-31 | 23.79 | 0.982 | 12.6% | 250.62 | 0.967 | 10.3% | 5,268,338 | 1.091 | 10.1% | 1.3711 | 1.021 | 9.5% |
| 14 | 2023-11-30 | 24.39 | 1.025 | 10.4% | 266.11 | 1.062 | 4.7% | 5,670,412 | 1.076 | 3.2% | 1.4488 | 1.057 | 4.4% |
| 15 | 2023-12-29 | 26.11 | 1.071 | 4.0% | 280.41 | 1.054 | 0.0% | 6,474,359 | 1.142 | 0.0% | 1.5850 | 1.094 | 0.0% |
| 16 | 2024-01-31 | 25.57 | 0.979 | 6.0% | 276.77 | 0.987 | 1.3% | 6,906,947 | 1.067 | 0.0% | 1.6113 | 1.017 | 0.0% |
| 17 | 2024-02-29 | 25.80 | 1.009 | 5.2% | 293.73 | 1.061 | 0.0% | 9,978,300 | 1.445 | 0.0% | 1.9318 | 1.199 | 0.0% |
| 18 | 2024-03-28 | 26.34 | 1.021 | 3.2% | 301.95 | 1.028 | 0.0% | 11,213,124 | 1.124 | 0.0% | 2.0559 | 1.064 | 0.0% |
| 19 | 2024-04-30 | 27.13 | 1.030 | 0.3% | 286.09 | 0.947 | 5.3% | 9,962,189 | 0.888 | 11.2% | 1.9502 | 0.949 | 5.1% |
| 20 | 2024-05-31 | 27.57 | 1.016 | 0.0% | 303.04 | 1.059 | 0.0% | 13,066,330 | 1.312 | 0.0% | 2.2374 | 1.147 | 0.0% |
| 21 | 2024-06-28 | 27.53 | 0.999 | 0.1% | 308.07 | 1.017 | 0.0% | 15,224,294 | 1.165 | 0.0% | 2.3954 | 1.071 | 0.0% |
| 22 | 2024-07-31 | 29.01 | 1.054 | 0.0% | 309.98 | 1.006 | 0.0% | 13,816,436 | 0.908 | 9.2% | 2.3499 | 0.981 | 1.9% |
| 23 | 2024-08-30 | 29.61 | 1.021 | 0.0% | 317.51 | 1.024 | 0.0% | 12,823,977 | 0.928 | 15.8% | 2.3142 | 0.985 | 3.4% |
| 24 | 2024-09-30 | 31.12 | 1.051 | 0.0% | 322.84 | 1.017 | 0.0% | 14,132,533 | 1.102 | 7.2% | 2.4557 | 1.061 | 0.0% |
| 25 | 2024-10-31 | 32.46 | 1.043 | 0.0% | 324.82 | 1.006 | 0.0% | 12,812,142 | 0.907 | 15.8% | 2.4001 | 0.977 | 2.3% |
| 26 | 2024-11-29 | 31.45 | 0.969 | 3.1% | 356.28 | 1.097 | 0.0% | 13,315,148 | 1.039 | 12.5% | 2.4850 | 1.035 | 0.0% |
| 27 | 2024-12-31 | 31.00 | 0.986 | 4.5% | 337.60 | 0.948 | 5.2% | 15,255,882 | 1.146 | 0.0% | 2.5803 | 1.038 | 0.0% |
| 28 | | | | | | | | | | | | | |
| 29 | CAGR | 9.8% | | | 18.4% | | | 150.1% | | | 60.6% | | |
| 30 | Mean | | 0.83% | | | 1.51% | | | 8.79% | | | 4.22% | |
| 31 | MAX DD | | | 12.6% | | | 10.3% | | | 17.5% | | | 11.4% |
| 32 | MAR | | 0.78 | | | 1.79 | | | 8.57 | | | 5.33 | |

| | O | P | Q | R | S |
|---|---|---|---|---|---|
| 1 | Strategy | S398 | SB029 | SB041 | total |
| 2 | Weight | 0.3 | 0.3 | 0.4 | 1 |

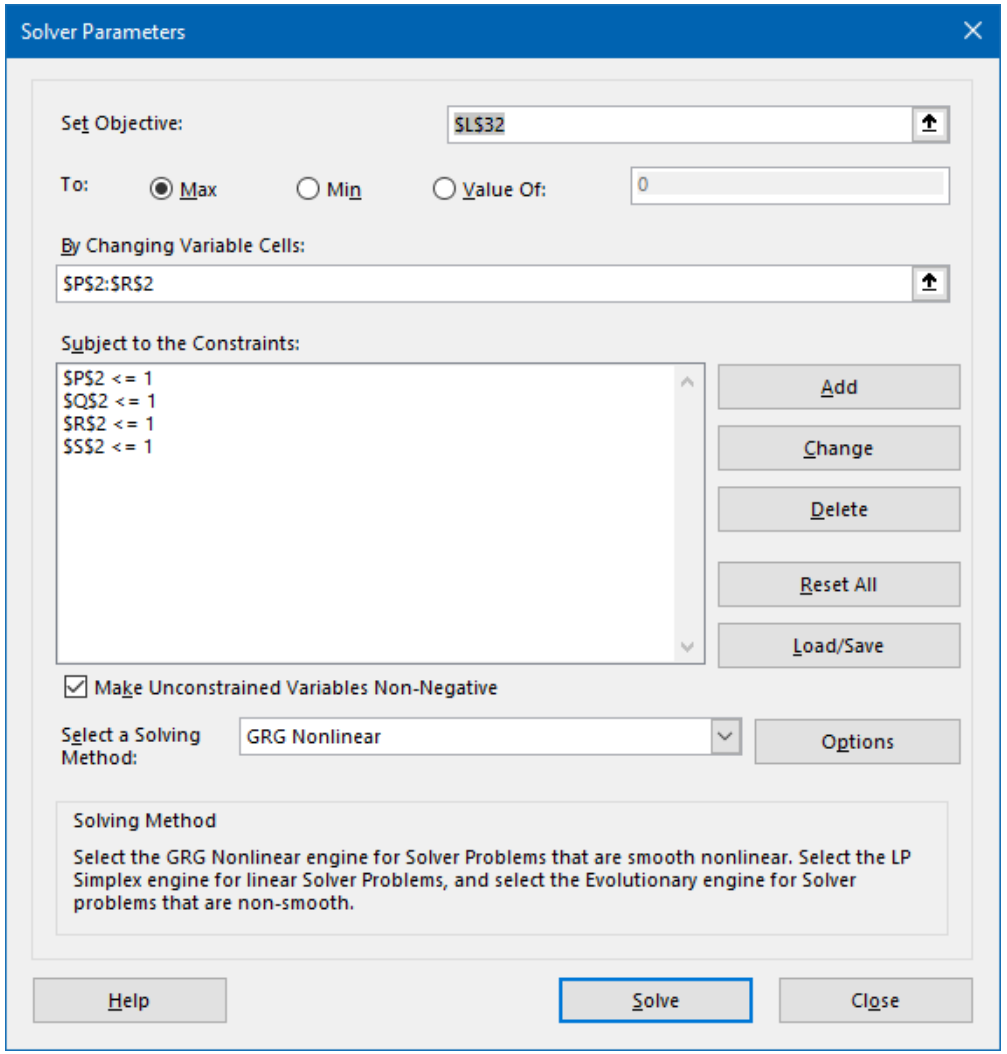
- Enter some sample coefficients (P2:R2) that sum to 100%
- In column L, calculate the weighted monthly return using the coefficients in P2:R2 * the returns for each strategy in columns C,F,I
- In column K, calculate the blended equity curve, based on column L.
- Copy the MaxDD formula to column M.
- Monthly rebalancing is implicit.
- Note the summary statistics for the blend.
- Play with the coefficients if you want.

# Launch “Solver”




- Solver is a free excel add-in
- You might have to load it if it is not pre-installed.
- It shows up under the “Data” tab, in the “analyze” group.

# Set parameters for Solver and run it.




- Under "Set objective" chose the cell you are trying to optimize, for example the MAR of the composite portfolio
- Under "by changing variable cells" enter the cells or range that you want to modify, in this case the coefficients.
- Under "constraints" enter the limits that the optimization needs to respect, e.g. all coefficients must sum to 1.
- Hit "solve" and read off the result.
- **In this short time period, a portfolio of 100% SB041 is optimal with respect to MAR – but the time period is not representative.**

# Can we get MaxDD to10%?

| Date | S398 | | SB029 | | SB041 | | Composite | |
|---|---|---|---|---|---|---|---|---|
| | Mo Return | DD % | Mo Return | DD % | Mo Return | DD % | Mo Return | DD % |
| 2022-12-30 | | | | | | | | |
| 2023-01-31 | 1.058 | 0.0% | 1.060 | 0.0% | 1.070 | 0.0% | 1.063 | 0.0% |
| 2023-02-28 | 0.946 | 5.4% | 0.968 | 3.2% | 1.070 | 0.0% | 0.994 | 0.6% |
| 2023-03-31 | 1.014 | 4.1% | 0.988 | 4.4% | 1.234 | 0.0% | 1.054 | 0.0% |
| 2023-04-28 | 1.009 | 3.3% | 0.988 | 5.5% | 1.042 | 0.0% | 1.003 | 0.0% |
| 2023-05-31 | 0.987 | 4.6% | 1.055 | 0.3% | 1.271 | 0.0% | 1.111 | 0.0% |
| 2023-06-30 | 0.978 | 6.7% | 1.052 | 0.0% | 1.167 | 0.0% | 1.081 | 0.0% |
| 2023-07-31 | 1.027 | 4.1% | 1.044 | 0.0% | 1.099 | 0.0% | 1.058 | 0.0% |
| 2023-08-31 | 0.973 | 6.7% | 0.967 | 3.3% | 0.936 | 6.4% | 0.959 | 4.1% |
| 2023-09-29 | 0.955 | 11.0% | 0.959 | 7.2% | 0.881 | 17.5% | 0.938 | 10.0% |
| 2023-10-31 | 0.982 | 12.6% | 0.967 | 10.3% | 1.091 | 10.1% | 1.000 | 10.0% |
| 2023-11-30 | 1.025 | 10.4% | 1.062 | 4.7% | 1.076 | 3.2% | 1.065 | 4.2% |
| 2023-12-29 | 1.071 | 4.0% | 1.054 | 0.0% | 1.142 | 0.0% | 1.077 | 0.0% |
| 2024-01-31 | 0.979 | 6.0% | 0.987 | 1.3% | 1.067 | 0.0% | 1.008 | 0.0% |
| 2024-02-29 | 1.009 | 5.2% | 1.061 | 0.0% | 1.445 | 0.0% | 1.162 | 0.0% |
| 2024-03-28 | 1.021 | 3.2% | 1.028 | 0.0% | 1.124 | 0.0% | 1.053 | 0.0% |
| 2024-04-30 | 1.030 | 0.3% | 0.947 | 5.3% | 0.888 | 11.2% | 0.933 | 6.7% |
| 2024-05-31 | 1.016 | 0.0% | 1.059 | 0.0% | 1.312 | 0.0% | 1.126 | 0.0% |
| 2024-06-28 | 0.999 | 0.1% | 1.017 | 0.0% | 1.165 | 0.0% | 1.056 | 0.0% |
| 2024-07-31 | 1.054 | 0.0% | 1.006 | 0.0% | 0.908 | 9.2% | 0.981 | 1.9% |
| 2024-08-30 | 1.021 | 0.0% | 1.024 | 0.0% | 0.928 | 15.8% | 0.999 | 2.0% |
| 2024-09-30 | 1.051 | 0.0% | 1.017 | 0.0% | 1.102 | 7.2% | 1.040 | 0.0% |
| 2024-10-31 | 1.043 | 0.0% | 1.006 | 0.0% | 0.907 | 15.8% | 0.980 | 2.0% |
| 2024-11-29 | 0.969 | 3.1% | 1.097 | 0.0% | 1.039 | 12.5% | 1.079 | 0.0% |
| 2024-12-31 | 0.986 | 4.5% | 0.948 | 5.2% | 1.146 | 0.0% | 1.001 | 0.0% |
| | | | | | | | | |
| CAGR | 9.8% | | 18.4% | | 150.1% | | 47.2% | |
| Mean | 0.83% | | 1.51% | | 8.79% | | 3.43% | |
| MAX DD | | 12.6% | | 10.3% | | 17.5% | | 10.0% |
| MAR | 0.78 | | 1.79 | | 8.57 | | 4.72 | |

| Strategy | S398 | SB029 | SB041 | total |
|---|---|---|---|---|
| Weight | 0.02 | 0.72 | 0.27 | 1.00 |

- Set solver to maximize CAGR subject to MaxDD<=10%
- Solver returns 27% SB041, 72% SB029 and 2% S398
- If cash were an option, the result would of course be different.

# What is the lowest possible MaxDD with these 3 strategies?

| | A | C | D | F | G | I | J | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | S398 | | SB029 | | SB041 | | Composite | | | Strategy | S398 | SB029 | SB041 | total |
| 2 | | Mo Return | DD % | Mo Return | DD % | Mo Return | DD % | Mo Return | DD % | | Weight | 0.95 | 0.00 | 0.05 | 1.00 |
| 3 | 2022-12-30 | | | | | | | | | | | | | | |
| 4 | 2023-01-31 | 1.058 | 0.0% | 1.060 | 0.0% | 1.070 | 0.0% | 1.058 | 0.0% | | | | | | |
| 5 | 2023-02-28 | 0.946 | 5.4% | 0.968 | 3.2% | 1.070 | 0.0% | 0.952 | 4.8% | | | | | | |
| 6 | 2023-03-31 | 1.014 | 4.1% | 0.988 | 4.4% | 1.234 | 0.0% | 1.024 | 2.6% | | | | | | |
| 7 | 2023-04-28 | 1.009 | 3.3% | 0.988 | 5.5% | 1.042 | 0.0% | 1.010 | 1.6% | | | | | | |
| 8 | 2023-05-31 | 0.987 | 4.6% | 1.055 | 0.3% | 1.271 | 0.0% | 0.999 | 1.6% | | | | | | |
| 9 | 2023-06-30 | 0.978 | 6.7% | 1.052 | 0.0% | 1.167 | 0.0% | 0.986 | 3.0% | | | | | | |
| 10 | 2023-07-31 | 1.027 | 4.1% | 1.044 | 0.0% | 1.099 | 0.0% | 1.031 | 0.0% | | | | | | |
| 11 | 2023-08-31 | 0.973 | 6.7% | 0.967 | 3.3% | 0.936 | 6.4% | 0.971 | 2.9% | | | | | | |
| 12 | 2023-09-29 | 0.955 | 11.0% | 0.959 | 7.2% | 0.881 | 17.5% | 0.951 | 7.6% | | | | | | |
| 13 | 2023-10-31 | 0.982 | 12.6% | 0.967 | 10.3% | 1.091 | 10.1% | 0.987 | 8.8% | | | | | | |
| 14 | 2023-11-30 | 1.025 | 10.4% | 1.062 | 4.7% | 1.076 | 3.2% | 1.028 | 6.3% | | | | | | |
| 15 | 2023-12-29 | 1.071 | 4.0% | 1.054 | 0.0% | 1.142 | 0.0% | 1.074 | 0.0% | | | | | | |
| 16 | 2024-01-31 | 0.979 | 6.0% | 0.987 | 1.3% | 1.067 | 0.0% | 0.983 | 1.7% | | | | | | |
| 17 | 2024-02-29 | 1.009 | 5.2% | 1.061 | 0.0% | 1.445 | 0.0% | 1.029 | 0.0% | | | | | | |
| 18 | 2024-03-28 | 1.021 | 3.2% | 1.028 | 0.0% | 1.124 | 0.0% | 1.026 | 0.0% | | | | | | |
| 19 | 2024-04-30 | 1.030 | 0.3% | 0.947 | 5.3% | 0.888 | 11.2% | 1.023 | 0.0% | | | | | | |
| 20 | 2024-05-31 | 1.016 | 0.0% | 1.059 | 0.0% | 1.312 | 0.0% | 1.030 | 0.0% | | | | | | |
| 21 | 2024-06-28 | 0.999 | 0.1% | 1.017 | 0.0% | 1.165 | 0.0% | 1.006 | 0.0% | | | | | | |
| 22 | 2024-07-31 | 1.054 | 0.0% | 1.006 | 0.0% | 0.908 | 9.2% | 1.047 | 0.0% | | | | | | |
| 23 | 2024-08-30 | 1.021 | 0.0% | 1.024 | 0.0% | 0.928 | 15.8% | 1.017 | 0.0% | | | | | | |
| 24 | 2024-09-30 | 1.051 | 0.0% | 1.017 | 0.0% | 1.102 | 7.2% | 1.053 | 0.0% | | | | | | |
| 25 | 2024-10-31 | 1.043 | 0.0% | 1.006 | 0.0% | 0.907 | 15.8% | 1.037 | 0.0% | | | | | | |
| 26 | 2024-11-29 | 0.969 | 3.1% | 1.097 | 0.0% | 1.039 | 12.5% | 0.972 | 2.8% | | | | | | |
| 27 | 2024-12-31 | 0.986 | 4.5% | 0.948 | 5.2% | 1.146 | 0.0% | 0.993 | 3.5% | | | | | | |
| 28 | | | | | | | | | | | | | | | |
| 29 | CAGR | 9.8% | | 18.4% | | 150.1% | | 14.6% | | | | | | | |
| 30 | Mean | 0.83% | | 1.51% | | 8.79% | | 1.19% | | | | | | | |
| 31 | MAX DD | | 12.6% | | 10.3% | | 17.5% | | 8.8% | | | | | | |
| 32 | MAR | 0.78 | | 1.79 | | 8.57 | | 1.65 | | | | | | | |
| 33 | | | | | | | | | | | | | | | |

- Set solver to minimize MaxDD.
- The lowest possible MaxDD is achieved with 95% S398 and 5% SB041.
- This is way better than S398 itself.
- But, trimming off the last bit of drawdown costs too much in terms of return.