Treat each transaction as separate, with its own principal, its own gain, and its own number of days. Then the total annualized return is just a weighted average of each annualized return, with the weighting related to the number of shares in that transaction.

Compound annual growth rate (CAGR) of a single investment of one or more shares bought at price *Po* and sold at price *Pn* after *t* years:

purchase price

value after *n* years time held (years)

Growth of a portfolio comprised of *n* purchases, with the *i*th purchase being for *m* shares:

shares bought in purchase

return on purchase

number of purchases

Problem: calculated portfolio growth can be positive, despite losing money

Ex: 2 purchases, one for $100 and one for $10, both sold for $50, one after 1 year and one after 0.5 years. Spent $110, received $100. Calculated return: +1175%.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Shares bought | Purchase price ($) | Sale price ($) | Time held (y) | Return (%) | CAGR (%) |
| 1 | 100 | 50 | 1 | -50 | -50 |
| 1 | 10 | 50 | 0.5 | 400 | 2400 |

Previously, I was calculating portfolio compound annual growth rate (CAGR) of a portfolio as

investment of one or more shares bought at price *Po* and sold at price *Pn* after *t* years:

purchase price

value at time *t* time held (years)

Calculate annual rate of return

Calculate annual rate of return



