Equal & Weighted average?

Equal-weighted portfolio is more tough.

You should calculate the weight every new trading date.

Equal-weight indices are easy to understand, amply diversified, and superior to cap-weight indices in long-term performance; Equal-weight indices have higher turnover and less liquid stocks than fundamentally weighted indices; they are also prone to select stocks that are more likely to be overpriced. The net-of-cost performance of an equal-weight strategy falls off with asset size much faster than a fundamentally weighted strategy.

Risk free rate & asset (less than risk free)?

Short the asset (expected rate of return lower than the risk-free rate) and get money

Buy the risk-free rate asset

~~After, sell risk-free rate~~

Hedge fund maximizes a Sharpe ratio

By writing out-of-money options, hedge fund can make returns very similar, thus the std will be very similar, sharp ratio will be large.

1/3 A, 2/3 B expected return and std

Expected return:

1/3\*1%+2/3\*2%

Standard deviation:

vp = ((x1^2)\*(s1^2)) + (2\*x1\*x2\*r12\*s1\*s2) + ((x2^2)\*(s2^2))

=1/9\*0.01+2\*1/3\*2/3\*0.5\*10%\*20%+4/9\*0.04

Sd=sqrt(vp)

Public-goods problem (tragedy of commons)

The tragedy of the commons is an economic problem in which every individual tries to reap the greatest benefit from a given resource. As the demand for the resource overwhelms the supply, every individual who consumes an additional unit directly harms others who can no longer enjoy the benefits.

Tax

Tax rate: ordinary income=interest payment>dividends (0.5\*income)>capital gains. Appropriate fedral income tax rates for highest-bracket ordinary retail= 37%.

When calculating tax, r(corporate)(1-tax rate)=r(muni)

liquidity premium and a transaction premia

A liquidity premium is an upfront(预付) lower price to compensate you for transaction costs later on. This can allow you to earn a higher expected rate of return on the investment. 投资者对该资产要求较高的预期收益 Liquidity premium- an extra expected rate of return to compensate you for your willingness to hold an asset that you may find difficult to convert into cash if a need were to arise. transaction premia Transaction costs here are defined in a very broad sense, and they include indirect costs, such as your time and money to search for the best deal

Common remedies for investor disagreements.

first mechanism: covenants

second mechanism: collateral

third mechanism: credit rating

How many year of returns to access trading performance to be reasonable.

In theory, everyday: the mean of return is around 1bps, and std around 1%. Suppose x days, t=2 to be significant, x/(100\*sqrt(x))=2, x=160 years.

In actual industry, there is no disagreement that most of the 3-year performance of funds is noise.

Evidence about superior trading performance Only about 54% of mutual funds that have outperformed their benchmarks over the last 1-3 years tend to outperform their benchmarks over the following 1-3 years. *past performance is no predictor of future performance.*

Short squeeze

A short squeeze is a situation in which a heavily shorted stock or commodity moves sharply higher, forcing more short sellers to close out their short positions and adding to the upward pressure on the stock.

Is no uncertainty a perfect market assumption? No, recall that this assumption does not mean that there is no un- certainty, but that investors do not disagree about the uncertainty.

codes in Rhtml

Value A B

My Grade 0 1

<table style="font-size:80%">

<caption> (for title) </caption> (\*delete) (这行table标题可以不写)

<thead>

<tr>

<th>Value</th>

<th>A</th>

<th>B</th>

</tr>

</thead>

<tbody>

<tr>

<td>My Grade</td>

<td>0</td>

<td>1</td>

</tr>

</tbody>

</table>

The cost of capital for rockets is about 5%; for communication satellites, it is 20%. 1-in-20 rockets tend to blow up. The rocket costs $60 million. The comm satellite costs $300 million, and is expected to fail with a 1-in-10 probability every year. If it functions, it is expected to earn a net of $100 million in a year. Is this a positive NPV investment?

Coc=(1/6)\*5%+(5/6)\*20%=17.5%

If functions, PV=-360+0.1\*0 + 0.9\*(100)/(1+r) + 0.9\*0.9\*(100)/(1+r)^2 + 0.9^3\*(100)/(1+r)^3 + 0.9^4\*(100)/(1+r)^4

-360+90+81+72.9+65.61<0

ETF is unlikely to appreciate as S&P 500

Low transaction costs High liquidity High transparency

Track S&P 500 return accurately

CAPM

ER-rf=beta\*(ERM-rf)

Why perfect market important?

Rate of return: unique, appropriate, equals to expected value

If no perfect market assumptions, the project value will depend on the owner of the project, then there is no “true” value for this proj.

all dividend day announcement and dividend ex-days

#download and read the csv

data<-fread()

#select useful variables

data\_new<-data[,c("announce\_date","ex\_days", …)]

#extract info

data\_new<-subset(data\_new, announce\_date!=”NA”& announce\_date!=” ”& ex\_days!=”NA”& ex\_days!=” ”)

#save in a csv. file

write.csv(data\_new, file="/Users/sinnie/Desktop/hw4\_annual\_data\_updated.csv")

Which perfect-market assumptions does the CAPM need? And not need?

1: No transaction cost& No taxation cost & No different in opinions (all info are available)

No big sellers or buyers

2: a large market with many competitive sellers and buyers (CAPM doesn’t need)

Inflation

Real Yield = Nominal Yield – Inflation

(1+return)/(1+inflation)-1

List some strategic options. Bull Call Spread Bear Put Spread Butterfly Spread Long Straddle Long Strangle

Classical Finance from Rational Economics v.s. Behavioral Finance

All believe in basic market efficiency for large market and liquid stoc

**Weak market efficiency** says that all information in past prices is reflected in today’s stock prices so that technical analysis (trading based solely on historical price patterns) cannot be used to beat the market.

**Semistrong market efficiency** says that all public information is reflected in today’s stock prices, so that neither fundamental trading (based on underlying firm fundamentals, such as cash flows or discount rates) nor technical analysis can be used to beat the market.

**Strong market efficiency says** that all information, both public and private, is reflected in today’s stock prices, so that nothing—not even private insider information—can be used to beat the market.

3 human bias

Moral hazard; adverse selection

Perfect market & efficient

A market is said to be efficient if it uses all available information in the price setting.

All perfect markets are efficient (in equilibrium), but not all efficient markets are perfect.

calculates geometric and arithmetic rates of return

library(readxl)

library(xts)

library(data.table)

SP500\_dr <- read\_excel("~/Desktop/S&P500\_Daily.xlsx")

RF\_mr<-read\_excel("~/Desktop/treasury.xlsx")

RF\_dr<-read\_excel("~/Desktop/FederalFunds.xlsx")

SP500\_dr$Date <- as.Date(as.character(SP500\_dr$Date), "%Y%m%d")

RF\_mr$Date <- as.Date(as.character(RF\_mr$Date), "%Y%m%d")

RF\_dr$Date <- as.Date(as.character(RF\_dr$Date), "%Y%m%d")

D\_index <- endpoints(SP500\_dr$Date, on = "days", k = 1)

M\_index <- endpoints(SP500\_dr$Date, on = "months", k = 1)

Y\_index <- endpoints(SP500\_dr$Date, on = "years", k = 1)

Y5\_index <- endpoints(SP500\_dr$Date, on = "years", k = 5)

#Y5\_index <- 0

#for(n in 1:(as.integer(length(Y\_index)/5))){

#Y5\_index <- append(Y5\_index, Y\_index[5\*n+1])}

#####get the return vector for Daily, Monthly, Yearly and 5-Yearly#####

CalMean <- function (index, return){

list <- vector()

for (i in 2:(length(index))){

sum <- 1

for (j in (index[i-1]+1):(index[i])){

sum <- sum \* (return[j] + 1)

}

list <- append(list, sum - 1)

}

list

}

D\_return <- SP500\_dr$vwretd

M\_return<-CalMean(M\_index, SP500\_dr$vwretd)

Y\_return <- CalMean(Y\_index, SP500\_dr$vwretd)

Y5\_return<- CalMean(Y5\_index, SP500\_dr$vwretd)

# annualized average arithmetic mean

AM\_annumean <- c(mean(D\_return)\*252,mean(M\_return)\*12,mean(Y\_return),mean(Y5\_return)/5)

AM\_annumean

#calculate geometric mean for Daily, Monthly, Yearly and 5-Yearly

GM<-function(return){

GM=prod(return+1)^(1/length(return))-1

return(GM)

}

# annualized average geometric mean

GM\_annumean <- c((1+GM(D\_return))^252-1,(1+GM(M\_return))^12-1,GM(Y\_return),(1+GM(Y5\_return))^(1/5)-1)

GM\_annumean

Credit spreads reflect a default premium = difference between the promised rate of return and the expected rate of return. This is not a market imperfection.

Credit spreads reflect difference in opinion between borrower and lender, which is a difference about the 2 assessed expected rates of return, is market imperfection.

Long-term: hard to disprove market efficiency since no one knows the correct pricing model.

Short-term: if the day-to-day rate of return is NOT small (5bp), then the market is likely to be inefficient no matter what model used.

In efficient market, prices should move only when there is news about future cashflow and discount rate, where news is defined as the unanticipated component of new information that is arriving.

Higher transaction cost → less information → market less efficient

Investor competition pushes markets toward efficient.

Small-firm stock has high transaction cost:

1.high bid-ask spread 2.high commissions 3.high cost of shorting

**A Ture Believer**: financial prices always reflect the best net present value estimate of all future cash flows. This means that stock prices should change correctly if and only if news about fundamentals (cash flows or discount rates) appears.

**A Firm Believer**: financial prices may sometimes deviate from the appropriate best estimate of future cash flows. However, transaction costs make it practically impossible for investors to find unusually good bets.

**A Mild Believer**: financial prices may sometimes deviate from the appropriate best estimate of future cash flows. However, they would argue that there are occasions when it is possible to exploit this misvaluation.

**A Nonbeliever**: financial prices regularly deviate from the appropriate value, which allows investors to obtain great bets routinely.

Signal-to-noise ratio in financial returns is low:

signal = appropriate expected price change (5-10 bp daily)

Noise = day-to-day price volatility (100-300 bp daily)

Market efficiency ⇒ random walk

random walk ≠⇒ market efficiency

All stocks tend to move together on a given day → not independent

Can regard returns from different days as independent observations

law of one price states that two identical items at the same time and location should have the same price.

Risky arbitrage ≈ a great bet (may not be risk-free)

Investment manager performance evaluation:

1.random luck 2.have better model 3.market is inefficient

As a CEO:

If the firm is undervalued, assume high COC and consider repurchasing firm’s own shares.

If the firm is overvalued, assume low COC and consider issuing more of firm’s own shares.

**If the market is perfect**, you can focus exclusively on your projects’ net present values. You can forget about most financial choices, such as what your capital structure should be, how you should report earnings, and so on. **If the market is imperfect**, you can create value, often by reducing the market imperfections themselves.

An **event study** is an empirical analysis of the effect of a set of events on the price of assets. They often tell us whether corporate actions are good news.

One of your first lessons about NPVs was that you can add them if projects are independent, but it is barely impossible to have independent projects.

Hedging is a form of risk management.

In **perfect market**, if 2 firms are independent, combining them usually reduce overall firm risks, but does not create value for investors. **Investors can diversify risk themselves.**