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You've Got to Speculate to Accumulate: Financial Markets and Portfolio Investments

Key Stage 5 Business
Resource 4

2019

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Resource Four Overview

Topic Portfolios

A-Level Modules Decision making, strategies

Objectives After completing this resource you should be able to:

- ✓ Calculate portfolio return.
- ✓ Distinguish between different weighting schemes.

Instructions

1. Read the data source
2. Complete the activities
3. Explore the further reading

Context

A portfolio investment is a hands-off or passive investment of securities in a portfolio, and it is made with the expectation of earning a return. This expected return is directly correlated with the investment's expected risk. Portfolio investment is distinct from direct investment, which involves taking a sizable stake in a target company and possibly being involved with its day-to-day management.

For a young investor with limited funds, mutual funds or exchange-traded funds may be appropriate portfolio investments. For a high net worth individual, portfolio investments may include stocks, bonds, commodities, and rental properties

Resource Four
Data Source

Section A

Introduction

Vanguard (https://personal.vanguard.com/us/FundsByName) offers various mutual funds for the investing public. All these funds are portfolios: they are combinations of various securities (stocks, bonds, etc.). To measure performance of a portfolio, recall:

$$1 + R_t = \frac{P_{t+1} + D_{t+1}}{P_t} = \frac{Payoff\ tomorrow}{Price\ today}$$

Assume you buy α_1 shares of stock 1 and α_2 shares of stock 2. The price (more precisely value) at time t is:

$$\alpha_1 P_{1t} + \alpha_2 P_{2t}$$

Next period, your portfolio is worth:

$$\alpha_1(P_{1,t+1} + D_{1,t+1}) + \alpha_2(P_{2,t+1} + D_{2,t+1})$$

Section B

Portfolio Return

The portfolio return is a weighted average of the individual stock returns, where the weights are the shares of wealth invested in each stock.

The portfolio return is:

$$1 + R_{p,t+1} = \frac{\alpha_1(P_{1,t+1} + D_{1,t+1}) + \alpha_2(P_{2,t+1} + D_{2,t+1})}{\alpha_1 P_{1t} + \alpha_2 P_{2t}}$$

Let ω_{it} be the fraction of wealth invested in stock i (for i = 1, 2), then

$$1 + R_{p,t+1} = \omega_{1t}(1 + R_{1,t+1}) + \omega_{2t}(1 + R_{2,t+1})$$

Example: Invest 40% of wealth in MFT, 60% in GE

If R_{MSFT} = 12.5% and R_{GE} = 25%, then

$R_{portfolio} = 0.4 * 12.5\% + 0.6 * 25\% = 5\% + 15\% = 20\%$

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Section C

Stock Indexes

Indexes are portfolios thought to represent the general stock market. Indexes are described by the number and identity of stock included, and the portfolio weight placed on them.

E.g. Dow Jones Industrial Average: a portfolio of 30 major stocks in America, including Boeing, Intel, Microsoft, Wal-Mart.

Alternative weighting scheme

1. Equal weighted: $\omega_i = 1/n$ (invest equal amount of dollars in all assets)
2. Price weighted: $\omega_i = P_i/(P_1 + \ldots + P_n)$
    - E.g.: Dow Jones Industrial Average: a portfolio of 30 major stocks in America, including Boeing, Intel, Microsoft, and Wal-Mart
3. Value weighted: $\omega_i = V_i/(V_1 + \ldots + V_n)$
    - Where V_i is the total market value of company i, $V_i = P_i * M_i$, where M_i is the number of shares outstanding
    - You invest more in companies with bigger market value
    - E.g.: Standard and Poor's 500: Index of 500 leading companies in the U.S.
4. Free float weighted: Same as value weighted, except shares held privately or by the government are excluded from the calculation
    - E.g.: Morgan Stanley Capital International indexes of foreign stocks.

Resource Four Activities

Activities

1. Portfolio weights in practice.

Suppose you have $100, and consider the following stock market data:

Name	2012 Price	2013 Price	# of shares
ABC Co.	$40	$45	100
XYZ Ltd.	$20	$33	50

How do the equal-weighted, price-weighted, and value-weighted portfolios look like in 2012?

2. Consider an investor who forms a portfolio, consisting of only two stocks, by investing $4,000 in one stock and $6,000 in a second stock. Suppose that the results after 1 year are:

Stock	Investment	Value after 1 yr	Rate of return
A	$4000	$5000	R_A = 25%
B	$6000	$5400	R_B = -10%
Total	?	?	?

Find value-weighted portfolio return and fill in the table.

3. Consider a portfolio of Microsoft and Starbucks stock in which you purchase ten shares of each stock at the end of month t at the following prices $P_{msft,t}$ = $85 and $P_{sbux,t}$ = $30, respectively.

The initial value of the portfolio is V_{t-1} = 10 × $85 + 10 × 30 = $1,150. Therefore, the proportion of each stock in the portfolio is x_{msft} = 850/1150 = 0.7391% and x_{sbux} = 30/1150 = 0.2609%.

Then suppose at the end of month t+1 the prices of the shares have changed to, $P_{msft,t+1}$ = $90 and $P_{sbux,t+1}$ = $28.

Assuming that Microsoft and Starbucks do not pay a dividend between periods t and t+1, calculate the following:

a) the returns on the two stocks

b) the one-month rate of return on the portfolio

c) the portfolio value at the end of month t.

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Further Reading

Explore

1. Investopedia: https://www.investopedia.com/terms/p/portfolio-return.asp
2. Online source on understanding of portfolio returns: https://faculty.washington.edu/ezivot/econ424/returnCalculations.pdf

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