Lecture 3: Assets continued

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3-asset-cont

QTM 385 Quantitative Finance

Lecture 3: Bonds and Equities

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Suggested reading: Investments Ch 2

TA

- Hao Wang (hao.wang@emory.edu) is the TA

- He will grade homework and he could office hour on demand

Financial markets

- **Financial markets** are segmented into money markets and capital markets
- **Money market**: short-term, marketable, liquid, low-risk debt securities
  - Money market instruments are also called cash equivalents
- **Capital market**: longer term, riskier securities
  - Longer term bond markets
  - Equity markets
  - Derivative markets for options and futures

Municipal bonds

- **Municipal bonds**: issued by state and local governments
  - Their interest income is exempt from federal income taxation
  - Also exempt from state and local taxation in the issuing state
- Choose between taxable and tax-exempt (municipal) bonds: Compare after-tax returns on each bond

Equivalent taxable yield of tax-exempt bond

$$r_{taxable}(1-t) = r_{muni} \quad \text{or} \quad r_{taxable} = r_{muni}/(1-t)$$

So the taxable return needs to be pretty high

where t is combined federal plus local marginal tax bracket

	Tax-Exempt Yield				
Marginal Tax Rate	1%	2%	3%	4%	5%
20%	1.25%	2.50%	3.75%	5.00%	6.25%
30	1.43	2.86	4.29	5.71	7.14
40	1.67	3.33	5.00	6.67	8.33
50	2.00	4.00	6.00	8.00	10.00

Table 2.1 Equivalent taxable yields corresponding to various tax-exempt yields

e.g. infrastructure
Also if you live in the state where the bond is issued, you are exempt from the state and local tax

"
A municipal bond, also known as a "muni bond," is a debt security issued by a state, city, or local government to finance public projects such as building schools, highways, or water treatment plants. The interest paid on municipal bonds is generally tax -free at the federal level and may also be tax-free at the state and local level, making them a popular investment for individuals in higher tax brackets."

From <https://chat.openai.com/chat>

"When a government entity, such as a city or state, issues a municipal bond, it is essentially borrowing money from investors. The government entity promises to repay the principal amount borrowed (the face value of the bond) to the bondholders at a specified date in the future (the maturity date). In return for lending their money, bondholders receive periodic payments of interest, known as "coupon payments", usually every six months, until the maturity date.

The interest rate, also known as the coupon rate, is the amount of interest paid as a percentage of the face value of the bond. For example, if a bond has a face value of $1000 and a coupon rate of 3%, the bondholder would receive $30 in interest each year ($1000 x 3%). On maturity date, the bond holder will receive the face value of the bond from the issuer."

e.g. if the marginal tax rate is 20%, then rtaxable is 6.25% for municipal bonds?

e.g. avg tax rate 30% risk is same for investment (taxable) then 5% / (1-30%) = 0.0714 = 7.14%
While municipal bonds return are 5% and again risk is the same

Tax-exempt of municipal bonds

- Cutoff tax bracket

$$1 - \frac{r_{muni}}{r_{taxable}}$$

- If an investor's tax bracket is higher than the cutoff bracket, municipal bond is more appealing
- Municipal bonds is attractive to high-tax-bracket investors

If investor tax bracket is higher than cutoff bracket, then municipal bond is more appealing
Otherwise, taxable is more appealing

So let's say cutoff bracket = 1 - 5%/7.14% = 0.2997 =30%
So if your marginal tax rate is higher than 30% then you should go for municipal bonds
Otherwise if your marginal tax bracket is lower then you should go for taxable opportunity

Exercise

- Suppose your combined federal plus state tax bracket is 30%.
- Would you prefer to earn a 6% taxable return or a 4% tax-free return?
- What is the equivalent taxable yield of the 4% tax-free yield?

Rtaxable = rmuni/(1-t)

Rtaxable = 4% / (1 - 30%) = 0.0571 which is 5.71% which is lower than 6%
So you'd want to go for the 6% taxable return

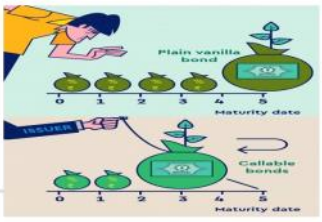
So the equivalent taxable yield is 5.71%

Corporate bonds

- **Corporate bonds**: Private firms borrow money from the public
  - Semiannual coupons over their lives and return the face value at maturity
  - Riskier than Treasury bonds
- **Secured bonds**: Secured by a specific asset owned by the issuer
- **Unsecured bonds**, called *debentures:* Backed by general credit rather than by specified assets

Callable corporate bonds

- **Callable bonds**: The firm has the option to repurchase the bond from the holder at a defined call price before maturity
  - Call price is usually higher than the par value
  - Usually called when interest rate is low as the firm can refinance at a lower rate
- Example: A 20-year maturity 9% coupon bond with par value $1,000 paying coupons semiannually is callable in five years at a call price of $1,050



Par value, also known as face value or principal amount, is the value at which a bond is issued and is the amount that the bond issuer promises to pay to the bondholder at the maturity date. It is the value of the bond that is used to calculate the bond's coupon payments, which are the periodic interest payments made to bondholders.

For example, if a bond has a face value of $1000 and a coupon rate of 3%, the bondholder would receive $30 in interest each year ($1000 x 3%).

Par value is also used to determine the bond's market value, which can fluctuate based on factors such as changes in interest rates and the issuer's creditworthiness. If a bond is trading at a discount to its par value, it means that it is trading for less than its face value. If it is trading at a premium, it means that it is trading for more than its face value.

Par value is not always the same as the price at which the bond is sold, especially when the bond is traded in the secondary market. Bond prices in the secondary market can be affected by a variety of factors such as interest rate, credit rating of the issuer, and the bond's maturity date.

Refinancing is the process of replacing an existing debt obligation with a new debt obligation that typically has better terms. In the context of a bond, refinancing refers to the process of issuing new bonds to pay off existing bonds.

There are several reasons why a bond issuer might choose to refinance their debt:

Interest rate risk: if interest rates have dropped since the original bond was issued, the issuer may refinance the bond at a lower interest rate to reduce their interest expense.
Credit risk: if the issuer's creditworthiness has improved since the original bond was issued, they may be able to refinance the bond at a lower interest rate or with more favorable terms.
Maturity: if the original bond is due to mature soon and the issuer would like to extend the maturity date to take advantage of longer-term financing.
Refinancing can also have tax implications, in most cases, refinancing allows the issuer to extend the bond's maturity date, which may affect the bond's yield to maturity, and may also affect the tax-free status of the bond.

Equity securities

- *Common stocks*, also known as *equity securities* or **equities**, represent ownership shares in a corporation
- Owner of common stock
  - Vote on any matters of corporate governance (can vote by proxy)
  - Share of the financial benefits of ownership
- Shareholders elect a board of directors
- The board selects managers
  - The board meets a few times a year
  - Managers run the firm on a day-to-day basis

Common stock and callable corporate bonds are both types of securities that can be bought and sold on the stock market, but they have some key differences.

Common stock represents ownership in a corporation. When you buy a share of common stock, you become a shareholder and have a claim to a small piece of the company's assets and earnings. Shareholders also have voting rights that allow them to participate in certain corporate decisions, such as the election of the board of directors. The value of common stock can increase or decrease depending on the performance of the company, and dividends may or may not be paid to the shareholders.

On the other hand, a corporate bond is a debt security issued by a corporation to raise capital. When you buy a bond, you are lending money to the corporation, and in return, the corporation promises to pay you interest, known as coupon payments, and return the principal amount at the bond's maturity date. The value of a bond can fluctuate based on changes in interest rates and the issuer's creditworthiness.

A callable bond is a type of bond that allows the issuer to redeem (or "call") the bond prior to its maturity date. This means that the issuer has the option to pay off the bond's principal early and stop making interest payments to the bondholders. This can be done if the issuer wants to refinance their debt or if interest rates have dropped and the issuer can borrow money at a lower rate.

In summary, common stock represents ownership in a company, while a callable bond represents a loan to a company, with the added feature that the issuer has the option to pay off the loan early.

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Characteristics of common stock

- Two characteristics of common stock: residual claims and limited liability
- **Residual claim**: Stockholders are the last to claim assets and income
  - In a *liquidation* of the firm's assets, claim what is left after tax authorities, employees, suppliers, bondholders, and other creditors have been paid
  - Not in *liquidation*, claim to the part of *operating income* left over after interest and taxes have been paid (as cash dividends or reinvest to increase the value of shares)
- **Limited liability**: Not personally liable for the firm's obligations
  - Unlike owners of unincorporated businesses (lay claim to personal assets, e.g., house, car)

When common stock has a residual claim, it means that the shareholders have a claim on the company's assets and earnings after all other claims have been satisfied. The residual claim refers to the fact that the shareholders are last in line to receive assets and earnings, after all other claims such as debt and preferred stock have been paid.

For example, if a company has debt and preferred stock outstanding, the creditors and holders of preferred stock will have to be paid first before the company distributes any earnings or assets to the common shareholders. This means that the common shareholders have a residual claim on the company's assets and earnings, and will only receive a distribution if there is something left over after all other claims ha ve been paid.

<- bad

The residual claim feature of common stock makes it a higher risk investment, as the shareholders have a claim on the company 's assets and earnings only after all other claims have been satisfied. It also means that the shareholders have more control over the company, as t hey have the right to vote on certain corporate decisions, and they may have more incentive to monitor the company's management, as they have a direct interest in the company's performance.

<- good

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When common stock has limited liability, it means that the shareholders' potential financial loss is limited to the amount they have invested in the company. Shareholders are not personally liable for the company's debts or liabilities. This is in contrast to other forms of ownership, such as a partnership or sole proprietorship, where the owners are personally liable for the company's debts.

For example, if a company goes bankrupt or is sued and is unable to pay its debts, the creditors cannot go after the personal assets of the shareholders to satisfy the debt. The shareholders will only lose the money they invested in the company.

This limited liability feature of common stock makes it a relatively low-risk investment, as the potential for loss is capped at the amount invested. However, it also means that the shareholders have less control over the company, as they are not personally liable for the company's actions, and they may have less incentive to monitor the company's management.

Stock market listings

- A small sample of stocks traded on the New York Stock Exchange
- 0.8 in NET CHG column: HSY's change in close price from the previous trading day
- 2.89 in dividend column: the last quarterly dividend payment was $.7225 per share
- 2.72 in annual dividend yield column: $2.89/$106.24 = .0272

NAME	SYMBOL	CLOSE	NET CHG	VOLUME	52 WK HIGH	52 WK LOW	DIV	YIELD	P/E	YTD %CHG
Herbalife Nutrition	HLF	57.94	−1.39	1,149,773	60.41	34.16	1.20	2.07	47.75	−1.71
Herc Holdings	HRI	26.86	−0.71	399,826	72.99	24.16	...	...	3.10	3.35
Heritage Insurance Holdings	HRTG	14.57	−0.38	81,929	15.15	12.85	0.24	1.65	22.01	−1.02
Hersha Hospitality Trust Cl A	HT	16.59	−0.16	732,879	24.16	16.50	1.12	6.75	.dd	−5.42
Hershey	HSY	106.24	0.80	1,145,889	114.63	89.10	2.89	2.72	22.00	−0.88
Hertz Global Holdings	HTZ	13.27	−0.77	2,965,201	25.14	13.01	...	...	2.24	−2.78
Hess Corp.	HES	42.39	0.15	5,969,511	74.81	35.59	1.00	2.36	.dd	4.67
Hess Midstream Partners	HESM	17.87	0.25	47,899	24.51	16.17	1.43	8.00	14.60	5.24
Hewlett Packard Enterprise	HPE	13.18	−0.28	11,756,695	19.48	12.09	0.45	3.41	11.46	−0.23

Volume: # of shares of the stock
Market capital (market cap) = # shares of the stock * stock price
A measure of the company's total value
If a stock is split into 2 shares, # shares goes up while stock price goes down. If a stock is worth $2000, it's not good for liquidity because it's very expensive to purchase a share. In many cases, you could only buy an integer number of shares. But on some platforms you can buy a fraction of a share but pay a higher trading cost. So the firm may have some incentives to split the stock. Then the stock price usually goes up in the following days.

52 wk high = highest price
52 wk low = lowest price
Get a sense of volatility

Dividend paid to the stockholder. 2.89 is the annual dividend calculated by the dividend paid in the last quarter (in the last quarter, the firm paid 2.89/4 = 0.7225 per share.)

Yield gives a sense of rate of return from dividend.
So it's annual dividend/closing price of stock today.

Dividend yield

- The dividend yield is only part of the return on a stock investment
- Another part is prospective capital gains (i.e., price increases) or losses
- Low-dividend firms presumably offer greater prospects for capital gains, or investors would not be willing to hold these stocks in their portfolios

A dividend is a distribution of a portion of a company's earnings to its shareholders. Dividends are typically paid out in cash, but can also be paid in the form of stock or other assets. They are usually paid out on a regular basis, such as quarterly or annually.

When a company earns a profit, it has several options on how to use that profit. It can reinvest the money back into the company to fund growth and expansion, pay off debt, or hold onto the cash as a reserve. Alternatively, the company can also choose to distribute a portion of the profit to its shareholders in the form of dividends.

Dividends are an important consideration for investors, as they provide a steady stream of income and can help generate returns in addition to the potential for capital appreciation. However, it is important to note that not all companies pay dividends, and the amount of dividends can vary greatly among companies. Some companies may choose to reinvest all of their profits back into the business, while others may pay out a high percentage of their earnings as dividends.

It is also important to note that dividends are not guaranteed and can be changed or suspended at any time at the discretion of the company's board of directors.

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P/E ratio

- The P/E ratio or **price-earnings ratio**: the ratio of stock price to last year's earnings per share
  - Indicates how much stock purchasers must pay per dollar of earnings that the firm generates
- When dividend yield and P/E ratio are not reported, the firms have zero dividends, or zero or negative earnings

The price-to-earnings ratio (P/E ratio) is a valuation ratio that compares a company's current stock price to its earnings per share (EPS). It is calculated by dividing the current stock price by the EPS. The P/E ratio is used to measure how expensive a stock is, relative to its earnings.

For example, if a company's stock is trading at $50 per share and its EPS is $5, the P/E ratio would be 10 (50/5). This means that investors are willing to pay $10 for every $1 of earnings that the company generates.

A high P/E ratio suggests that investors have high expectations for the company's future earnings, while a low P/E ratio suggests that investors have lower expectations. A higher P/E ratio means that investors are paying more for each dollar of earnings, and therefore it is more expensive (rate of return is lower for dividends, Holder is counting on increase in stock price for profit).

IBM vs Uber

It is important to note that P/E ratio can vary greatly among companies and industries, and that a high or low P/E ratio does not necessarily indicate whether a stock is overvalued or undervalued. It is also important to consider the company's growth prospects and the overall market conditions when interpreting P/E ratios. Additionally, the P/E ratio doesn't take into account the company's debt, cash balance and other liabilities, so it's not a comprehensive measure of a company's valuation.

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Preferred stock

- **Preferred stock** promises to pay a fixed amount of income each year
- Compare to common stock
  - No voting power
  - **Preferred dividends** are usually *cumulative:* unpaid dividends cumulate and need to be paid in full before being paid to holders of common stock
- Compare to bond
  - Similar to an infinite-maturity bond
  - No contractual obligation to pay preferred dividends, but contractual obligation to make the interest payments on the debt

AS compared to common stocks.

Preferred stock is a type of stock that has some characteristics of both common stock and bonds. Like common stock, preferred shares represent an ownership stake in a company and give the holder voting rights in certain corporate matters. Like bonds, preferred shares typically have a fixed dividend and a priority claim on the company's assets and earnings before common shareholders.

Preferred shareholders have priority over common shareholders in the event of a bankruptcy or liquidation. This means that in case of a company goes bankrupt, the preferred shareholders will be paid before common shareholders. They also have priority over common shareholders when it comes to dividends. Preferred stock typically has a fixed dividend, which means that the company is obligated to pay a specific dividend to the preferred shareholders, regardless of whether the company is profitable or not.

Preferred stock is considered less risky than common stock, but more risky than bonds. The dividends are usually higher than bonds, but lower than common stock. Additionally, the price of preferred stock is less affected by interest rate changes and is more affected by the company's credit rating. Preferred stock can be a good investment for those seeking a steady income stream, however, it is not suitable for those seeking for high growth opportunities.

The firm can pay whenever they want.
There's no term, unlike bonds. It's like an infinite maturity bond.

Stock market indexes

- Well known stock market indexes include
  - Dow Jones Industrial Average: 30 large, "blue-chip" corporations
  - Standard & Poor's Composite 500 (S&P 500): about 500 firms
  - NASDAQ: more than 3,000 firms traded on the NASDAQ market
  - NASDAQ 100 is a subset of the larger firms in NASDAQ
  - …
- Stock weights in the index
  - Price-weighted average
  - Market-value-weighted average
  - Equally weighted average

Market share and market capitalization are related but they are not the same thing.

Market share is a measure of a company's sales or market presence compared to its competitors in a specific market or industry. It is typically expressed as a percentage of the total market. For example, if a company has a market share of 20%, it means that the company holds 20% of the total market in terms of sales or market presence.

Market capitalization, on the other hand, is a measure of a company's total value. It is calculated by multiplying the number of shares outstanding by the current market price of a single share. Market capitalization gives an idea of how big a company is and how much liquidity it has.

In summary, market share is a measure of a company's sales or market presence in a specific market or industry, while market capitalization is a measure of a company's total value. They are related in that a company with a large market share in an industry is likely to have a large market capitalization, but it's not always the case.

Price weighted average = weighted average of the stock prices of the firms
Dow Jones
Market value weighted average = based on market value of the firm in the index
SP500, NASDAQ, NASDAQ 100

Price-weighted average

- Example: Dow Jones Industrial Average
- Originally, back in 1896, the Dow was the average price of stocks in the index
- Consider the two-stock version of the Dow
  - Stock ABC starts at $25 a share and increases to $30
  - Stock XYZ starts at $100, but falls to $90
  - Initial index value $= (25 + 100)/2 = 62.5$
  - Final index value $= (30 + 90)/2 = 60$
  - Percentage change in index $= -2.5/62.5 = -.04 = -4\%$

Stock	Initial Price	Final Price	Shares (million)	Initial Value of Outstanding Stock ($ million)	Final Value of Outstanding Stock ($ million)
ABC	$ 25	$30	20	$500	$600
XYZ	100	90	1	100	90
Total				$600	$690

Price-weighted average and market value-weighted average are two different ways to calculate an index of a group of stocks or other securities.

A price-weighted index is calculated by taking the average price of the securities in the index, with each security's price given equ al weight. For example, if an index contains three stocks: A, B, and C, with prices of $50, $100, and $150 respectively, the price-weighted index would be calculated as follows: (50+100+150)/3 = $100. This means that a $1 move in stock B will have the same effect on the index as a $1 move in stock A, regardless of their market capitalization.

On the other hand, a market value-weighted index is calculated by taking into account not only the price of each security, but also the number of shares outsta nding and the market capitalization of each security. This means that securities with higher market capitalization will have a greater impa ct on the index. For example, using the same stocks and prices as above, the market value-weighted index would be calculated as follows: (5010+1005+150*2)/(10+5+2) = $88. This means that a $1 move in stock B, will h ave a greater impact on the index than a $1 move in stock A, because stock B has a greater market capitalization than stock A.

In summary, price-weighted average gives equal weight to each security regardless of their market capitalization, while market value -weighted average gives weight based on market capitalization. Market value-weighted average is a more accurate reflection of the performance of the market as it takes into account the size of the comp anies.

The Dow now

- The Dow no longer equals the average price of the 30 stocks because the averaging procedure is adjusted for two events
  - a stock splits or pays a stock dividend of more than 10%
  - one company in the group of 30 industrial firms is replaced by another
- To leave the indexed unaffected by two events, the **divisor** to compute the "average price" is adjusted
  - By 2019, the divisor for the Dow had fallen to a value of about .1475.

Divisor adjustment in stock splits

- Suppose XYZ splits two for one so that its share price falls to $50
- The index value before the stock split: $(25 + 100)/2 = 62.5$
- We find a new divisor, d, that leaves the index unchanged. We solve d in the following equation

$$\frac{Price\ of\ ABC + Price\ of\ XYZ}{d} = \frac{25+50}{d} = 62.5$$

- $d = \frac{25+50}{62.5} = 1.2$

Stock	Initial Price	Final Price	Shares (million)	Initial Value of Outstanding Stock ($ million)	Final Value of Outstanding Stock ($ million)
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XYZ	100	90	1	100	90
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XYZ	50	45	2	100	90
Total				$600	$690

Rate of return after the splits

- The split changes the price of XYZ and the relative weights of the two stocks in the price-weighted average. Therefore, the return of the index is also affected

- Initial index value before the split = $(25 + 100)/2 = 62.5$
- Final index value after the split and price change = $(30 + 45)/1.2 = 62.5$
- Percentage change in index = 0

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Companies included in the Dow: 1928 and 2019

Dow Industrials in 1928	Current Dow Companies	Ticker Symbol	Industry	Year Added to Index
Wright Aeronautical	3M	MMM	Diversified industrials	1976
Allied Chemical	American Express	AXP	Consumer finance	1982
North American	Apple	AAPL	Electronic equipment	2015
Victor Talking Machine	Boeing	BA	Aerospace and defense	1987
International Nickel	Caterpillar	CAT	Construction	1991
International Harvester	Chevron	CVX	Oil and gas	2008
Westinghouse	Cisco Systems	CSCO	Computer equipment	2009
Texas Gulf Sulphur	Coca-Cola	KO	Beverages	1987
Texas Corp	Disney	DIS	Broadcasting and entertainment	1991
Standard Oil (NJ)	DowDuPont	DWDP	Chemicals	1935
General Electric	ExxonMobil	XOM	Oil and gas	1928
American Tobacco	Goldman Sachs	GS	Investment banking	2013
Sears Roebuck	Home Depot	HD	Home improvement retailers	1999
General Motors	Intel	INTC	Semiconductors	1999
Chrysler	IBM	IBM	Computer services	1979
Atlantic Refining	Johnson & Johnson	JNJ	Pharmaceuticals	1997
Paramount Public	JPMorgan Chase	JPM	Banking	1991
Bethlehem Steel	McDonald's	MCD	Restaurants	1985
General Railway Signal	Merck	MRK	Pharmaceuticals	1979
Mack Trucks	Microsoft	MSFT	Software	1999
Union Carbide	Nike	NKE	Apparel	2013
American Smelting	Pfizer	PFE	Pharmaceuticals	2004
American Can	Procter & Gamble	PG	Household products	1932
Postum Inc	Travelers	TRV	Insurance	2009
Nash Motors	UnitedHealth Group	UNH	Health insurance	2012
American Sugar	United Technologies	UTX	Aerospace	1939
Goodrich	Verizon	VZ	Telecommunications	2004
Radio Corp	Visa	V	Electronic payments	2013
Woolworth	Walgreens Boots	WBA	Pharmaceuticals	2018
U.S. Steel	Walmart	WMT	Retailers	1997

Table 2.4

Companies included in the Dow Jones Industrial Average: 1928 and 2019

Market-value-weighted average

- Example: S&P 500, NASDAQ, NASDAQ100
- The initial value was $\$600M$, and the final value is $\$690M$
- Suppose the initial index value is set as 100 (can also set as other value)
- Final index value = $100 \times (690/600) = 115$
- Percentage change in index = $115/100 - 1 = 0.15 = 15\%$
- Percentage change not affected by stock splits

Stock	Initial Price	Final Price	Shares (million)	Initial Value of Outstanding Stock ($ million)	Final Value of Outstanding Stock ($ million)
ABC	$ 25	$30	20	$500	$600
XYZ	100	90	1	100	90
Total				$600	$690

Stock	Initial Price	Final Price	Shares (million)	Initial Value of Outstanding Stock ($ million)	Final Value of Outstanding Stock ($ million)
ABC	$25	$30	20	$500	$600
XYZ	50	45	2	100	90
Total				$600	$690

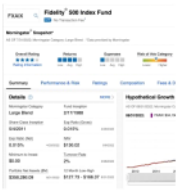
Equally weighted average

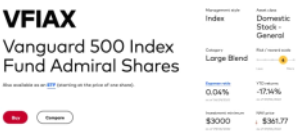
- Equally weighted average of the returns of each stock in an index
- Equivalent to a portfolio strategy that invests equal dollar values in each stock
- Initial index value $= 2$ ($\$1$ in ABC and $\$1$ in XYZ)
- Final index value $= \frac{30}{25} \times 1 + \frac{45}{50} \times 1 = 1.2 + 0.9 = 2.1$
- Percentage change in index $= \frac{2.1}{2} - 1 = 5\%$
  - Average of 20% of ABC and -10% of XYZ

Stock	Initial Price	Final Price	Shares (million)	Initial Value of Outstanding Stock ($ million)	Final Value of Outstanding Stock ($ million)
ABC	$25	$30	20	$500	$600
XYZ	50	45	2	100	90
Total				$600	$690

Invest in market indexes

- One way is to purchase *index funds* (shares in mutual funds that hold shares in proportion to their representation in the S&P 500 or another index)
  - Purchase directly from the fund or through brokers or financial advisers





Invest in market indexes

- Another approach is to purchase an *exchange-traded fund*, or ETF, which is a portfolio of shares that can be bought or sold as a unit, just as one can buy or sell a single share of stock
  - Trade index portfolios as stocks
  - Lower management cost