中南财经政法大学

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Financial Markets

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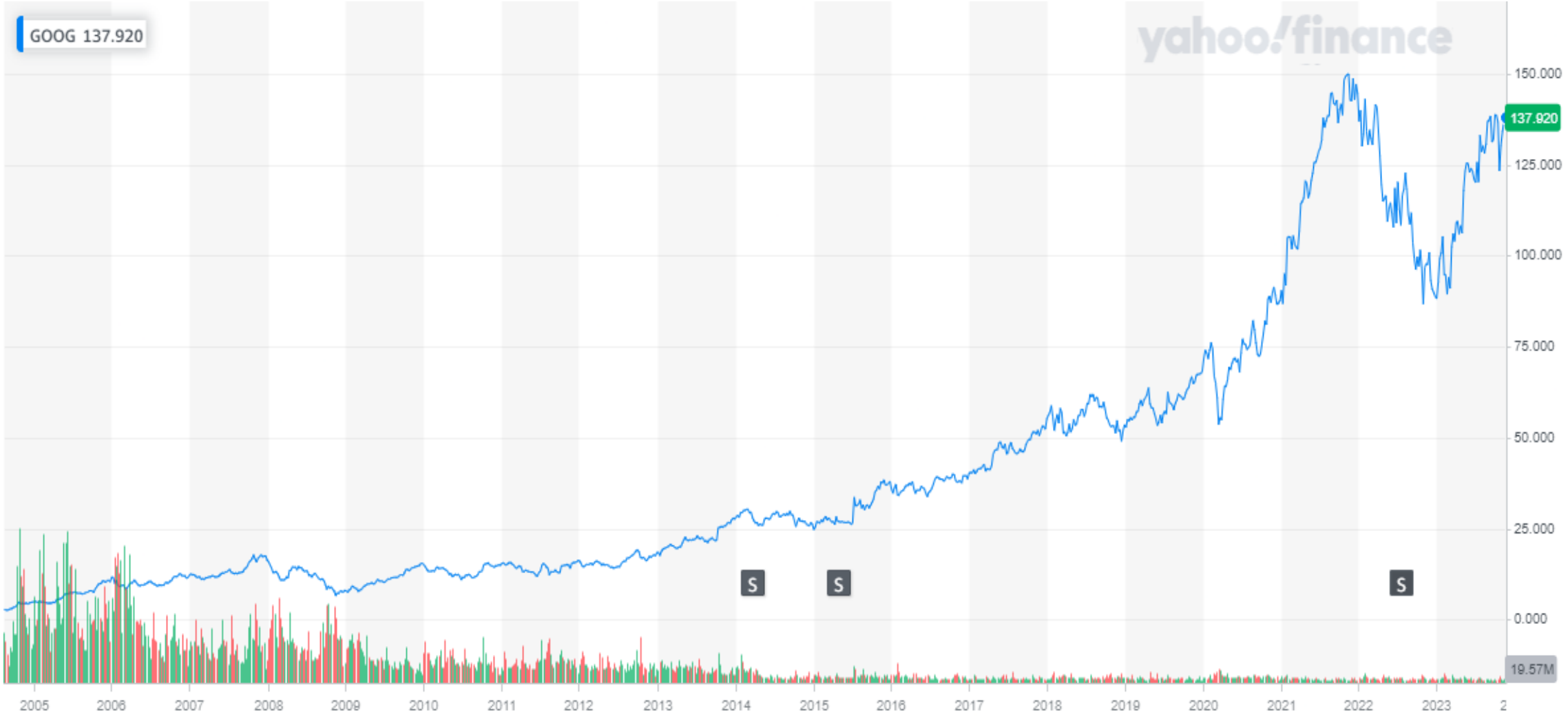
Chapter 13: The Stock Market

Chapter Preview

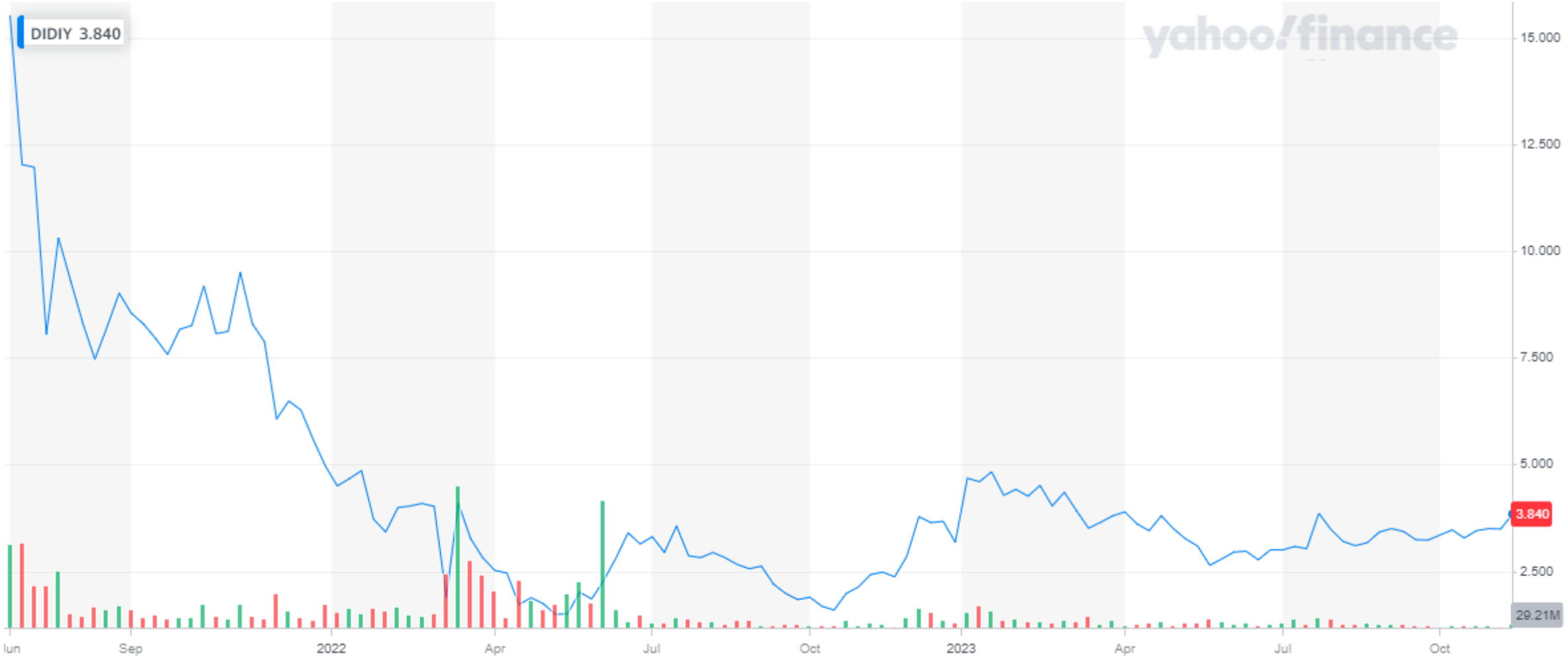
In August of 2004, Google went public, auctioning its shares in an unusual IPO format. The shares originally sold for $85 per share, and closed at over $100 on the first day.

On Jun 30, 2021, DiDi Global (DIDI) made its debut on the NYSE at $14 per share, and closed at $14.14 apiece on the first day.

Chapter Preview



Chapter Preview



Chapter Preview

On Nov. 21, 2023:

Alphabet Inc.(Google) is traded at $137.92 per share. (Two splits, approx. 2:1 (2014), 20:1(2022))

DiDi Global is traded at $3.84 per share.

and...

On May. 8, 2022:

DiDi Global is traded at $1.49 per share

Chapter Preview

The stock market receives considerable attention from investors. As Google illustrates, great fortunes can be made!

But may also incur a great loss if you heavily invested in DiDi....

This is the focus of chapter 13—a look at the equity side of investing

Chapter Preview

We examine the markets where stocks trade, and then review the underlying theories for stock valuation. We learn that stock valuations is quite difficult. Topics include:

- Investing in Stocks
- Computing the Price of Common Stock
- How the Market Sets Security Prices
- Errors in Valuation
- Stock Market Indexes
- Buying Foreign Stocks
- Regulation of the Stock Market

Investing in Stocks

1. Represents ownership in a firm
2. Earn a return in two ways
   - Price of the stock rises over time
   - Dividends are paid to the stockholder
3. Stockholders have a claim on all assets and income left over after all other claimants have been satisfied.
4. Right to vote for directors and on certain issues
5. Two types:
   - Common stock: Right to vote, Receive dividends
   - Preferred stock: Receive a fixed dividend, Do not usually vote

Common Stock VS. Preferred Stock VS. Bonds

Why would an investor prefer preferred stocks to Bonds?

Preferred Stocks have higher payments. (better than bonds)

Preferred Stocks guarantees fixed dividends. (better than common stocks)

Common Stock VS. Preferred Stock VS. Bonds

Why would company issue preferred stocks, but not common stocks or bonds?

- Preferred stock dividend payments can be deferred if the company is facing financial hardship and avoid the risk of defaulting.
- Company may want to achieve a low debt-to-equity ratio, which is an important metric used to analyze the financial stability of a company.
- Preferred stock has the call feature.
- Owners of preferred stock do not have voting rights, which can limit investors' control on the company.
- Preferred stock can act as "poison pills" in the event of hostile takeover.

poison pill....sounds familiar?

TECH

Twitter board adopts 'poison pill' after Musk's $43 billion bid to buy company

PUBLISHED FRI, APR 15 2022·12:31 PM EDT | UPDATED FRI, APR 15 2022·8:11 PM EDT

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KEY POINTS

- Twitter adopted a limited duration shareholder rights plan, often called a "poison pill," a day after billionaire Elon Musk offered to buy the company for $43 billion, the company announced Friday.
- Such a move is a common way to fend off a potential hostile takeover by diluting the stake of the entity eying the takeover.
- The board voted unanimously to adopt the plan.

Elon Musk Twitter Takeover Timeline

January 31: Musk starts buying shares of Twitter in near-daily installments, amassing a 5% stake in the company by mid-March.

March 26: Musk, who has tens of millions of Twitter followers and is active on the site, says he is giving "serious thought" to building an alternative to Twitter, questioning the platform's commitment to "free speech" and whether Twitter is undermining democracy. He also privately reaches out to Twitter board members including his friend and Twitter co-founder Jack Dorsey.

March 27: After privately informing Twitter of his growing stake in the company, Musk starts conversations with its CEO and board members about potentially joining the board. Musk also mentions taking Twitter private or starting a competitor, according to later regulatory filings.

April 4: A regulatory filing reveals that Musk has rapidly become the largest shareholder of Twitter after acquiring a 9% stake, or 73.5 million shares, worth about $3 billion.

April 5: Musk is offered a seat on Twitter's board on the condition he amass no more than 14.9% of the company's stock. CEO Parag Agrawal said in a tweet that "it became clear to us that he would bring great value to our Board."

April 9: After exchanging pleasantries and bonding by text message over their love of engineering, a short-lived relationship between Agrawal and Musk sours after Musk publicly tweets "Is Twitter dying?" and gets a message from Agrawal calling the criticism unhelpful. Musk tersely responds: "This is a waste of time. Will make an offer to take Twitter private."

April 11: Twitter CEO Parag Agrawal announces Musk will not be joining the board after all.

April 14: Twitter reveals in a securities filing that Musk has offered to buy the company outright for about $44 billion.

April 15: Twitter's board unanimously adopts a "poison pill" defense in response to Musk's proposed offer, attempting to thwart a hostile takeover.

Source: The Associated Press

Investing in Stocks: How Stocks are Sold

1. Organized exchanges:

- NYSE is best known, with daily volume around 18.9 billion shares.
- "Organized" is used to imply a specific trading location. But computer systems (ECNs) have replaced this idea.
- Others include the ASE (US), and Nikkei, LSE, DAX (international)
- Listing requirements exclude small firms

Investing in Stocks: How Stocks are Sold

- Over-the-counter markets:
  - Best example is NASDAQ
  - Dealers stand ready to make a market
  - Today, about 3,000 different securities are listed on NASDAQ
  - Important market for thinly-traded securities—securities that don't trade very often. Without a dealer ready to make a market, the equity would be difficult to trade.

Investing in Stocks: Organized vs. OTC

- Organized exchanges (e.g., NYSE)
  - Auction markets with floor specialists
  - 10% of trades are filled directly by specialist
  - Remaining trades are filled through Super Display Book (SDBK)

- Over-the-counter markets (e.g., NASDAQ)
  - Multiple market makers set bid and ask prices
  - Multiple dealers for any given security

Investing in Stocks: Organized vs. OTC

Trading Venue

(1) Organized exchanges:

Organized securities exchanges that provide centralized locations for buying and selling securities. These exchanges have physical or electronic trading floors where buyers and sellers interact.

(2) OTC market:

The OTC market is decentralized, and trades occur directly between buyers and sellers without a centralized exchange. Communication and transactions often take place through electronic communication networks (ECNs) or over the phone.

Investing in Stocks: Organized vs. OTC

Listing Requirements

(1) Organized exchanges:

Companies must meet specific listing requirements to be traded on organized exchanges. These requirements often include financial performance criteria, corporate governance standards, and minimum share prices.

(2) OTC market:

There are typically fewer listing requirements for securities to be traded OTC compared to organized exchanges. Many smaller or newer companies that may not meet the criteria for exchange listing trade on the OTC market.

Investing in Stocks: Organized vs. OTC

Standardization VS Customization

(1) Organized exchanges:

Trading on exchanges is highly standardized, with set procedures and rules governing transactions. The price and quantity of securities are determined by the market through a centralized order book.

(2) OTC market:

OTC trades are often more flexible and can involve customized agreements between parties. This flexibility allows for the trading of securities that may not meet the standardization requirements of organized exchanges.

Investing in Stocks: Organized vs. OTC

Regulation

(1) Organized exchanges:

Organized exchanges are subject to strict regulatory oversight to ensure fair and transparent trading. Regulatory bodies, such as the Securities and Exchange Commission (SEC) in the United States, monitor and enforce compliance.

(2) OTC market:

While OTC transactions are subject to regulatory oversight, the regulatory framework is generally less stringent compared to organized exchanges.

Investing in Stocks: ECNs

- ECNs (electronic communication networks) allow brokers and traders to trade without the need of the middleman. They provide:

  - Transparency: everyone can see unfilled orders
  - Cost reduction: smaller spreads
  - Faster execution
  - After-hours trading

Investing in Stocks: ECNs

However, ECNs are not without their drawbacks:

- Don’t work as well with thinly-traded stocks
- Many ECNs competing for volume, which can be confusing
- Major exchanges are fighting ECNs, with an uncertain outcome

Investing in Stocks: ETFs

Exchange Traded Funds are a recent innovation to help keep transaction costs down while offering diversification.

- Represent a basket of securities
- Traded on a major exchange
- Index to a specific portfolio (eg., the S&P 500), so management fees are low (although commissions still apply)
- Exact content of basket is known, so valuation is certain

Investing in Stocks: ETFs

The primary disadvantage of ETFS:

Since ETFs are still traded like stocks, investors have to pay a broker commission each time they buy or sale shares.

This provides a cost disadvantage compared to mutual funds for those who want to frequently invest small amounts.

Computing the Price of Common Stock

If you require a 15% return to compensate you for the risk of owning stock, you expect company XYZ to pay $.15 in dividends this year, and expect the company to sell for $30 at the end of the year, how much would you be willing to pay for the company today?

Suppose you decide the stock is more risky than you originally thought. How does this affect the price you are willing to pay?

Computing the Price of Common Stock

Valuing common stock is, in theory, no different from valuing debt securities: determine the future cash flows and discount them to the present at an appropriate discount rate.

We will review four different methods for valuing stock, each with its advantages and drawbacks.

Computing the Price of Common Stock:
1. The One-Period Valuation Model

To value the stock today, you need to find the present discounted value of the expected cash flows.

The **One-Period Valuation Model**:

$$P_0 = \frac{D_1}{1 + k_e} + \frac{P_1}{1 + k_e}$$

Where

P_0 = the current price of the stock

D_1 = the dividend paid at the end of year 1

k_e = the required return on investments in equity, it is not the interest rate.

P_1 = the price at the end of the first period; the predicted sales price of the stock

Computing the Price of Common Stock:
1. The One-Period Valuation Model

What is the price for a stock with an expected dividend and price next year of $0.16 and $60, respectively? Use a 12% discount rate.

Computing the Price of Common Stock:
1. The One-Period Valuation Model

Answer:

$$\text{Price} = \frac{0.16}{(1 + 0.12)} + \frac{60}{(1 + 0.12)} = 53.71$$

Computing the Price of Common Stock:
2. Generalized Dividend Valuation Model

Using the present value concept, we can extend the one-period valuation model to the **Generalized Dividend Valuation Model**:

$$P_0 = \frac{D_1}{1+k_e} + \frac{D_2}{(1+k_e)^2} + \ \ldots + \frac{D_n}{(1+k_e)^n} + \frac{P_n}{(1+k_e)^n}$$

In this equation, it looks like that you need to find P_n before you can calculate P_0. However, if P_n is far in the future, $\lim_{n\to\infty} \frac{P_n}{(1+k_e)^n} = 0$, so it will not affect P_0. The model can be simplified as:

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t}$$

The price of the stock is determined only by the present value of the future dividend stream.

Computing the Price of Common Stock:
3. Gordon Growth Model

The generalized dividend valuation model requires that we compute the present value of an infinite stream of dividends, a process that could still be difficult. If we impose an assumption on the stream of dividends, we can further simplify the model.

The Gordon Growth Model Assumptions:

1. Dividends are assumed to continue growing at a constant rate forever (g)
2. The growth rate g is assumed to be less than the required return on equity k_e

$$P_0 = \frac{D_0(1+g)}{k_e - g} = \frac{D_1}{k_e - g}$$

Where

D_0 = the most recent dividend paid

P_0 = the current price of the stock

Case 1: The Global Financial Crisis and the Stock Market

- The financial crisis that started in August 2007 led to one of the worst bear markets in 50 years.

- Downward revision of growth prospects: ↓g

- Increased uncertainty: ↑k_e

$$P_0 = \frac{D_0(1+g)}{k_e - g} = \frac{D_1}{k_e - g}$$

- Gordon model predicts a drop in stock prices.

Case 2: 9/11, Enron and the Market

- Both 9/11 and the Enron scandal were events in 2001.
- Both should lower “g” in the Gordon Growth model—driving down prices.
- Also impacts k_e—higher uncertainty increases this value, again lowering prices.
- We did observe in both cases that prices in the market fell.

How do we calculate dividend growth?

One difficulty in applying these stock valuation models is that we need some estimate of the long term growth of dividends (g).

One simplistic approach is to use the average compound annual growth rate over a reasonably long period of time.

$$g = \sqrt[n]{\frac{D_t}{D_{t-n}}} - 1$$

Quiz: estimate Coca-Cola's stock price

Year	1992	1993	1994	1995	1996
Dividend ($)	0.66	0.70	0.80	0.88	1.00

Coca-Cola's dividends history is shown above. Let us assume that its dividends will grow at a constant rate, and the required return is $k_e = 13\%$. Could you calculate the price of Coca-Cola's stock price in 1996?

Quiz: estimate Coca-Cola's stock price

Year	1992	1993	1994	1995	1996
Dividend ($)	0.66	0.70	0.80	0.88	1.00

$$g = \sqrt[4]{\frac{1.00}{0.66}} - 1 = 1.1095 - 1 = 0.1095 = 10.95\%$$

$$P_t = \frac{D_t(1+g)}{k_e - g} = \frac{1.00 \times 1.1095}{0.13 - 0.1095} = 54.12$$

Required Return on Equity

Another way of using the constant growth model of stock prices is to decompose the required return on equity into its component parts:

$$P_t = \frac{D_t(1+g)}{k_e - g} = \frac{D_{t+1}}{k_e - g}$$

$$P_t(k_e - g) = D_{t+1}$$

$$(k_e - g) = \frac{D_{t+1}}{P_t}$$

$$k_e = \frac{D_{t+1}}{P_t} + g$$

Required Return on Equity

$$k_e = \frac{D_{t+1}}{p_t} + g$$

The required return on equity is equal to the dividend yield plus the capital yield.

- **Dividend yield:** The amount paid to shareholders as a percentage of the firms current stock price.
- **Capital yield:** The yield a stock holder receives due to an increasing stock price, or due to internal investment of retained earnings.
- One way to look at this required return equation is to use it to calculate an expected return based on expected growth in dividends, earnings, or sales.

Computing the Price of Common Stock:
4. Generalized Dividend Valuation Model

The *price earnings ratio (PE)* is a widely watched measure of much the market is willing to pay for $1.00 of earnings from the firms.

$$Price = \frac{P}{E} \times E$$

1. A higher-than-average PE may mean that the market expects earnings to rise in the future.
2. A high PE may alternatively indicate that the market feels the firm's earnings are very low risk and is therefore willing to pay a premium for them.

Quiz

If the PE ratio for the Tech sector is 20, how much should you pay for a firm with earnings for $1.25 / share?

Quiz

Price = 20 x $1.25 = $25

How the Market Sets Security Prices

- The price is set by the buyer willing to pay the highest price. The price is not necessarily the highest price the asset could fetch, but it is greater than what any other buyers are willing to pay.

- The market price will be set by the buyer who can take best advantage of the asset.

- Superior information about an asset can increase its value by reducing its perceived risk. If you have inferior info, to compensate yourself for the uncertainty, you will require a higher return.

- When new information is released about a firm, expectations and prices change. Market participants constantly receive information and revise their expectations, so stock prices change frequently.

How the Market Sets Security Prices

Suppose that you are considering the purchase of stock expected to pay dividends of $2 next year. The firm is expected to grow at 3% infinitively.

1. You are quite uncertain about the constancy of the dividend stream and the accuracy of the estimated growth rate. To compensate yourself for this risk, you require a return of 15%.
2. Jennifer talked with industry insiders and feels more confident about this company, so she requires only a 12% return because her perceived risk is lower than yours.
3. Bud, on the other hand, is dating the CEO of this company. He knows very well about this company, and he requires a 7% return.

What are the values each investor will give to the stock? Who will get the stock?

How the Market Sets Security Prices

Consider the following three valuations for a stock with certain dividends but different perceived risk:

Investor	Discount Rate	Stock Price
You	15%	$16.67
Jennifer	12%	$22.22
Bud	7%	$50.00

Bud, who perceives the lowest risk, is willing to pay the most and will determine the “market” price.

Note: It is also possible that the person willing to pay the highest price is simply the one with an incorrect perception of risk!

Errors in Valuation

Although the pricing models are useful, market participants frequently encounter problems in using them. Any of these can have a significant impact on asset valuation models.

- Problems with Estimating Growth
- Problems with Estimating Risk
- Problems with Forecasting Dividends

Errors in Valuation

To illustrate this point, the following two tables show how dramatically a stock's price can change by simple changes in the expected dividend growth rate (Table 13.1) and required return (Table 13.2).

TABLE 13.1 Stock Prices for a Security with $D_0 = \$2.00$, $k_e = 15\%$, and Constant Growth Rates as Listed

Growth (%)	Price
1	$ 14.43
3	17.17
5	21.00
10	44.00
11	55.50
12	74.67
13	113.00
14	228.00

TABLE 13.2 Stock Prices for a Security with $D_0 = \$2.00$, $g = 5\%$, and Required Returns as Listed

Required Return (%)	Price
10	$42.00
11	35.00
12	30.00
13	26.25
14	23.33
15	21.00

Errors in Valuation

These two tables also point out that security valuation is not an exact science.

Considering different growth rates, required rates, etc., is important in determining if a stock is a good value as an investment.

Stock Market Indexes

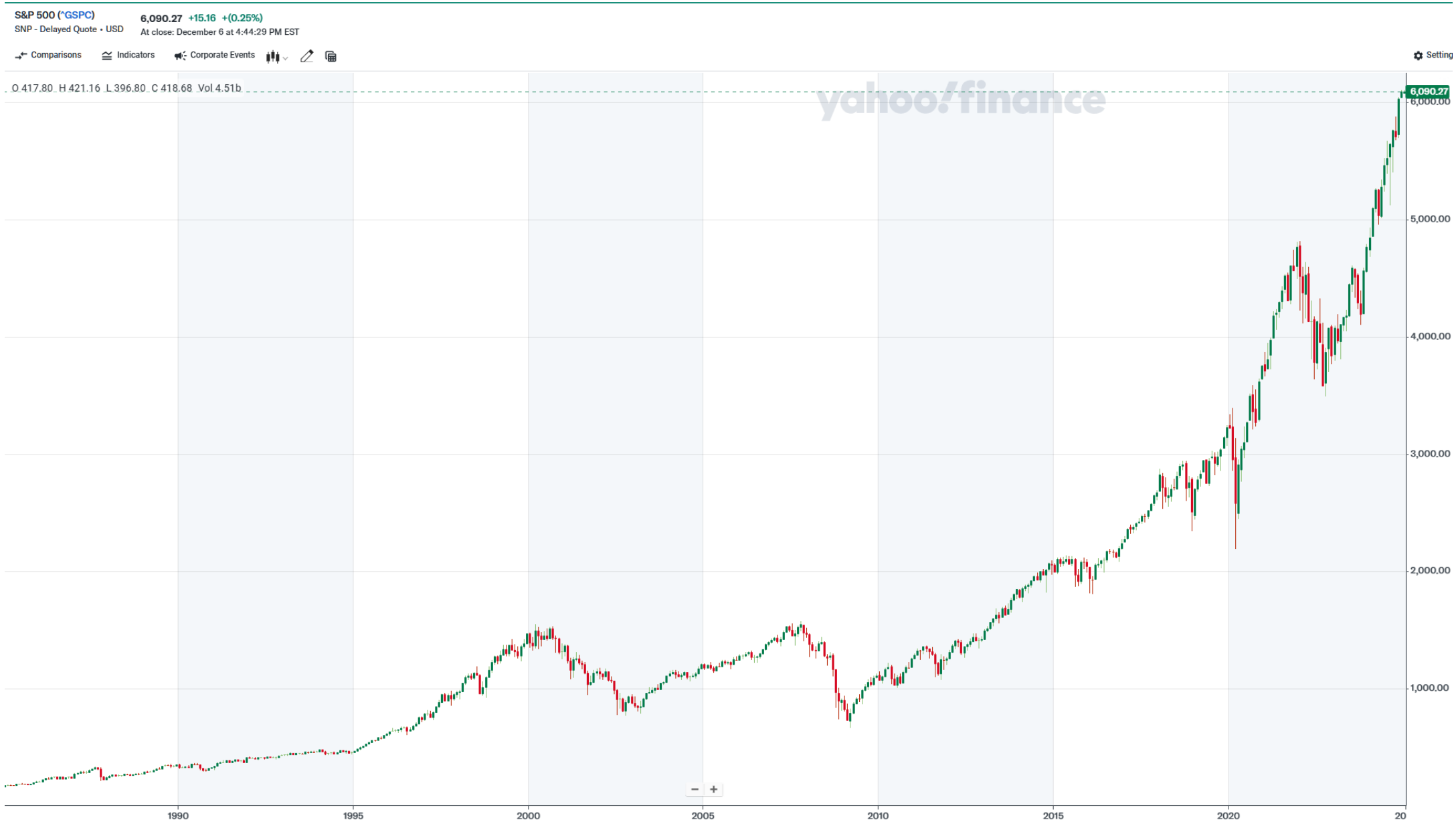
- Stock market indexes are frequently used to monitor the behavior of a groups of stocks.

- Major indexes include the Dow Jones Industrial Average, the S&P 500, and the NASDAQ composite

- The securities that make up the (current) DJIA are listed here:

https://www.slickcharts.com/dowjones

Stock Market Indexes



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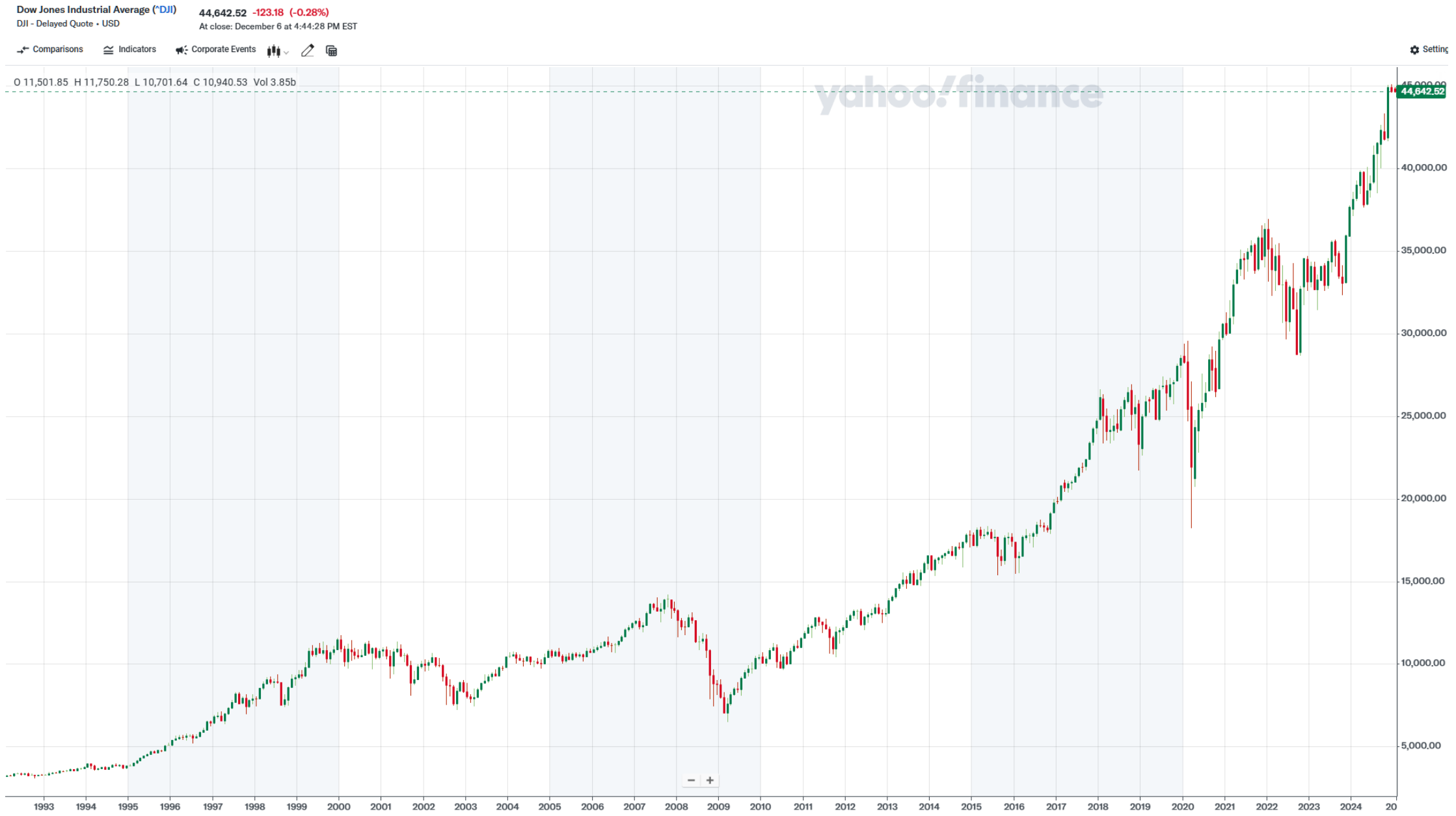
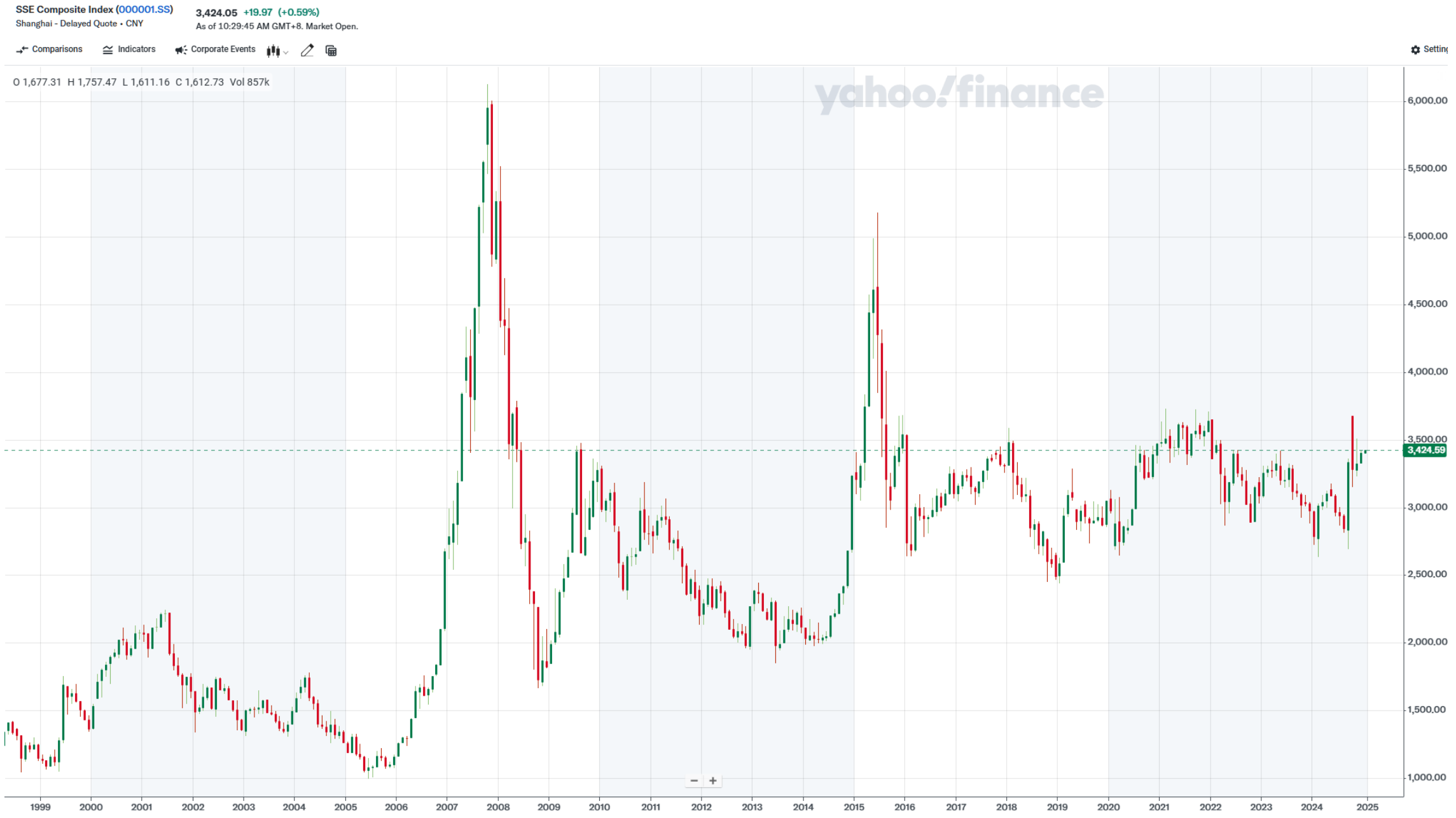


Stock Market Indexes



Buying Foreign Stocks

Buying foreign stocks has potential benefits for diversifications.

American Depository Receipts (ADRs): A U.S. bank buys the shares of a foreign company and places them in its vault. The bank then issues receipts against these shares, and these receipts can be traded domestically.

ADRs allows foreign firms to trade in the U.S. without the firms having to meet the disclosure rules required by the SEC.

Regulation of the Stock Market

- The primary mission of the SEC is, "…to protect investors and maintain the integrity of the securities markets."

- The SEC brings around 500 actions against individuals and firms each year toward this effort. This is accomplished through the joint efforts of four divisions.
  - Division of **Corporate Finance**: responsible for collecting, reviewing, and making available all of the documents corporations and individuals are required to file
  - Division of **Market Regulation**: establishes and maintains rules for orderly and efficient markets.
  - Division of **Investment Management**: oversees and regulates the investment management industry
  - Division of **Enforcement**: investigates violations of the rules and regulations established by the other divisions.

Chapter Summary

- Investing in Stocks: we developed an understanding the structure of the various trading systems, including exchanges and OTC markets
- Computing the Price of Common Stock: various techniques for valuing dividends and earnings were presented
- How the Market Sets Security Prices: the basic idea that prices are set by the “highest bidder” was reviewed
- Errors in Valuation: difficulties in determining dividends, growth rates, and/or required returns can have a significant impact in the pricing models
- Stock Market Indexes: a way to track changes in valuation for a broad group of stocks
- Buying Foreign Stocks: potential benefits for diversifications, simplified by the use of ADRs.
- Regulation of the Stock Market: the primary function of the Securities and Exchange Commission

Acknowledgment

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