Valuation, Style Investing, and Global Markets

SILC Business School

Shanghai University

Week 3

April, 2023

Valuation and Style Investing

Style Investing

★ Style Investing

An investment strategy that involves selecting stocks or securities based on their adherence to certain investment styles or characteristics. Investment styles can include factors:

- growth
- value
- momentum
- low volatility

The goal of style investing:

- Achieving higher returns by investing in stocks that have specific styles that are expected to perform well in a particular market environment.

By identifying stocks with certain investment styles, investors hope to achieve higher returns and lower risk than the overall market or a specific benchmark.

Valuing Common Stock

★ Discounted Cash Flow Models

The investor who owns shares of common stock has the right to receive a certain portion of any cash dividends. But there is no guarantee that dividends will be paid in the future.

Q. How can we relate that return to what a share of common stock is worth?

A. The value of a share of stock should be equal to the present value of all the future cash flows an investor expects to receive from that share. To value stock, an investor must project future cash flows, which, in turn, means projecting future dividends.

Valuing Common Stock

★ Dividend Discount Models (DDM)

Most DDM use current dividends, some measure of historical or projected dividend growth, and an estimate of the required rate of return.

- Dividend Measures

Dividends are measured using three different metrics:

1. dividends per share
2. dividend yield
3. dividend payout ratio

The value of a share of stock today is the investors' assessment of today's worth of future cash flows for each share. Because future cash flows to shareholders are dividends, we need a measure of dividends for each share of stock to estimate future cash flows per share.

Valuing Common Stock

- Dividends per share

The dividends per share is the dollar amount of dividends paid out during the period per share of common stock:

$$\text{Dividends per share} = \frac{\text{Dividends paid to common shareholders}}{\text{Number of shares of common stock outstanding}}.$$

If a company has paid \$600,000 in dividends to common shareholders during the period and there are 1.5 million shares of common stock outstanding, then

$$\text{Dividends per share} = \frac{\$600{,}000}{1{,}500{,}000} = \$0.4 \text{ per share}.$$

The company paid out 40 cents in dividends per common share during this period.

Valuing Common Stock

- Dividend yield

The dividend yield is the ratio of dividends to the common stock's current price:

$$\text{Dividend yield} = \frac{\text{Annual cash dividends per common share}}{\text{Market price per common share}}.$$

We also refer to the dividend yield as the dividend-price ratio. If the current price per share of a company is \$20 and the company has paid \$2 in annual cash dividends per common share, then

$$\text{Dividend yield} = \frac{\$2}{\$20} = 0.1\ (10\%).$$

Valuing Common Stock

- Dividend payout ratio

Dividends paid out during a period is the dividends as a portion of earnings for the period:

$$\text{Dividend payout ratio} = \frac{\text{Dividends paid to common shareholders}}{\text{Earnings available to common shareholders}}.$$

If a company pays \$360,000 in dividends to common shareholders and has earnings available to common shareholders of \$1.2 million, the dividend payout ratio is 30%:

$$\text{Dividend payout ratio} = \frac{\$360{,}000}{\$1{,}200{,}000} = 0.3\ (30\%).$$

This means that the company paid out 30% of its earnings to common shareholders.

Valuing Common Stock

★ Basic Dividend Discount Models

The basis for the dividend discount model is simply the application of present value analysis, which asserts that the fair price of an asset is the present value of the expected cash flows. The cash flows are the expected dividends per share. We can express the basic DDM mathematically as:

$$\begin{aligned} P_0 &= \frac{D_1}{(1+r_1)^1} + \frac{D_2}{(1+r_2)^2} + \frac{D_3}{(1+r_3)^3} + \cdots \\ &= \sum_{t=1}^{\infty} \frac{D_t}{(1+r_t)^t}, \end{aligned} \tag{1}$$

P_0: Current price of the stock

D_t: Dividend per share in period t

r_t: Discount rate appropriate for the cash flow in period t

In this model, we expect to receive dividends. If investors never expected a dividend to be paid, this model implies that the stock would have no value.

Valuing Common Stock

- The Finite-Life General Dividend Discount Model

We can modify the DDM given by equation (1) by assuming a finite life for the expected cash flows. This model is the finite-life general DDM and which we can express mathematically as:

$$\begin{aligned} P_0 &= \frac{D_1}{(1+r_1)^1} + \frac{D_2}{(1+r_2)^2} + \frac{D_3}{(1+r_3)^3} + \cdots + \frac{P_N}{(1+r_N)^N} \\ &= \sum_{t=1}^{N} \frac{D_t}{(1+r_t)^t} + \frac{P_N}{(1+r_N)^N}, \end{aligned}$$

P_N: Expected value of the stock at the end of period N

Valuing Common Stock

- Assuming a Constant Discount Rate

A special case of the finite-life general DDM that is more commonly used in practice assumes that the discount rate is constant. That is, we assume each r_t is the same for all t. Denoting this constant discount rate by r, the value of a share of stock today becomes:

$$\begin{aligned} P_0 &= \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \cdots + \frac{P_N}{(1+r)^N} \\ &= \sum_{t=1}^{N} \frac{D_t}{(1+r)^t} + \frac{P_N}{(1+r)^N}, \end{aligned} \tag{2}$$

Valuing Common Stock

EXAMPLE 1. The finite life general DDM based on a constant discount rate Suppose that an investor makes the following estimates and assumptions for stock A:

- Required rate of return of 10%.
- Current dividend of \$2 per share.
- Growth in dividends of 4% per year.
- Expected price of the stock at the end of four years is \$29.835.

$$\begin{aligned} P_0 &= \frac{\$2.08}{(1+0.10)^1} + \frac{\$2.16}{(1+0.10)^2} + \frac{\$2.25}{(1+0.10)^3} + \frac{\$2.34}{(1+0.10)^4} + \frac{\$29.835}{(1+0.10)^4} \\ &= \$27.34. \end{aligned}$$

The expected price today, \$27.34, is our estimate of the value of a share of the stock based on our estimates and assumptions.

Valuing Common Stock

- Required Inputs

The finite-life general DDM requires three sets of forecasts as inputs to calculate the fair value of a stock:

- Expected terminal price, P_N
- Dividends up to the assumed horizon, D_1 to D_N
- Discount rates, r_1 to r_N, or r.

- The relevant issue is how accurately these inputs can be forecasted.

According to theory, P_N is the present value of all future dividends after N; $D_{N+1}, D_{N+2}, \cdots D_{N+\infty}$. Also, we must estimate the discount rate, r. In practice, we make forecasts of

1. either dividends (D_N) or earnings (E_N),
2. price P_N based on an "appropriate" requirement for yield, price earnings ratio, or capitalization rate.

Note that the present value of the expected terminal price $P_N/(1+r)^N$ becomes very small if N is very large.

Valuing Common Stock

EXAMPLE 2. Estimating the discount rate

Usually, information on past dividends is readily available and we can estimate cash flows for a given scenario. In practice for a given company, we assume that r (required rate of return) is constant for all periods, and typically estimate this rate from the capital asset pricing model (CAPM). Consider three companies, A, B, and C. Suppose that

- The market risk premium is 5%
- The risk-free rate is 4.63%

The discount rate, r, by the beta estimate for each company based on the CAPM is:

Company	Beta	Calculation	Discount Rate
A	0.9	$0.0463 + (0.9 \times 0.05)$	9.13%
B	1.0	$0.0463 + (1.0 \times 0.05)$	9.63%
C	1.2	$0.0463 + (1.2 \times 0.05)$	10.63%

Valuing Common Stock

- Constant Growth Dividend Discount Model

If we assume that future dividends grow at a constant rate, g, and we use a single discount rate, r, the finite-life general DDM assuming a constant growth rate given by equation (2) becomes:

$$P_0 = \frac{D_0(1+g)^1}{(1+r)^1} + \frac{D_0(1+g)^2}{(1+r)^2} + \cdots + \frac{D_0(1+g)^N}{(1+r)^N} + \frac{P_N}{(1+r)^N}$$

It can be shown that if N is assumed to approach infinity, above equation is equal to:

$$P_0 = \frac{D_0(1+g)}{(r-g)} \tag{3}$$

Equation (3) is the constant growth dividend discount model. Therefore, the greater the expected growth rate of dividends, the greater the estimated value of a share of stock.

Valuing Common Stock

How do we estimate g?

If we believe that dividends will grow in the future at a similar rate as they grew in the past, we can estimate the dividend growth rate by using the compounded rate of growth of historical dividends. The compound growth rate, g, is found using the following formula:

$$g = \sqrt[\text{N of years}]{\frac{\text{Last year's dividend}}{\text{First year's dividend}}} - 1 \tag{4}$$

Valuing Common Stock

EXAMPLE 3. Estimate the value of a stock, using the past growth as our best estimate of the future growth of dividends

Suppose a company paid \$1.50 in dividends in 2021 and paid \$2.00 in dividends in 2025. Using the time value of money mathematics, the 2025 dividend is the future value, the starting dividend is the present value, and the number of years is the number of periods; solving for the interest rate produces the growth rate.

$$g = \sqrt[4]{\frac{\$2.00}{\$1.50}} - 1 = 7.457\%.$$

If the discount rate, r, for this company's dividends is 15%, the value of a share of stock in 2025 is:

$$P_0 = \frac{\$2.00(1 + 0.07457)}{0.15 - 0.07457} = \frac{\$2.14914}{0.07543} = \$28.49.$$

Keep in mind that we are valuing this stock as of 2025, which means that the numerator in this valuation equation is the expected dividend in 2026, which is the 2025 dividend multiplied by $1 + g$.

Valuing Common Stock

What if you estimate a stock's value and the estimated value is considerably off the mark when compared to the stock's actual price? The reasons for this discrepancy may include:

- The market's expectations of the company's dividend growth pattern may not be for constant growth
- The growth rate of dividends in the past may not be representative of what investors expect in the future.

Another problem that arises in using the constant growth rate model is that the estimated growth rate of dividends may exceed the discount rate, r. Therefore, there are some cases in which it is inappropriate to use the constant rate DDM.

Valuing Common Stock

★ Expected Returns and Dividend Discount Models

We compare the model-derived price to the actual price and the appropriate action is taken.

We can recast the model in terms of expected return. This is found by calculating the interest rate that will make the present value of the expected cash flows equal to the market price. Mathematically, we can express this as:

$$r = \frac{D_0(1+g)}{P_0} + g = \frac{D_1}{P_0} + g. \tag{5}$$

In other words, the expected return is the discount rate that equates the present value of the expected future cash flows with the present value of the stock. The higher the expected return–for a given set of future cash flows–the lower the current value. Therefore, this is the expected capital gain or loss (or, simply, capital yield) on the stock.

Valuing Common Stock

EXAMPLE 4. Discount Rate

Consider a company that currently pays a dividend of \$1 per share, has a current share price of \$20, and dividends are expected to grow at a rate of 5% per year. Using this information, we estimate the discount rate as 10.25%:

$$r = \frac{\$1(1+0.05)}{\$20} + 0.05 = \frac{\$1.05}{\$20} + 0.05 = 10.25\%.$$

Given the expected return and the required return (that is, the value for r), any mispricing can be identified. If the expected return exceeds the required return, then the stock is undervalued; if it is less than the required return then the stock is overvalued. A stock is fairly valued if the expected return is equal to the required return.

Valuing Common Stock

★ Relative Valuation Methods

Although stock and company valuation is very strongly tilted toward the use of discounted cash lofw methods, it is impossible to ignore the fact that many investors use other methods to value equity and entire companies.

- The primary alternative valuation method:
  - Price/ X ratios
  - “X” is the measure of performance that is highly correlated with cash flow.

For example, The price/earning (P/E) ratio is a popular multiple used for relative valuation, where an earnings estimate is the cash flow generating performance measure. However, there is no theory to guide the investor on how best to scale observed market prices by one of the following

- Net earning
- Earnings before interest and taxes (EBIT)
- Sales
- Book Value of Assets

Valuing Common Stock

EXAMPLE 5. Relative Valuation

Consider Company ABC that has projected earnings per share of $2.5 and a projected book value per share of $4. Determine the estimated value of this Company ABC, based on a relative value using:

- The price-earning ratio
- The market value to book value ratio
- The average of the respective multiples of the comparables:

	Value per Share	Earning per Share	Book Value per Share
Apple	$165	$5.88	$3.58
Nike	$122	$3.5	$9.41
Alphabet Inc	$104	$4.65	$19.93

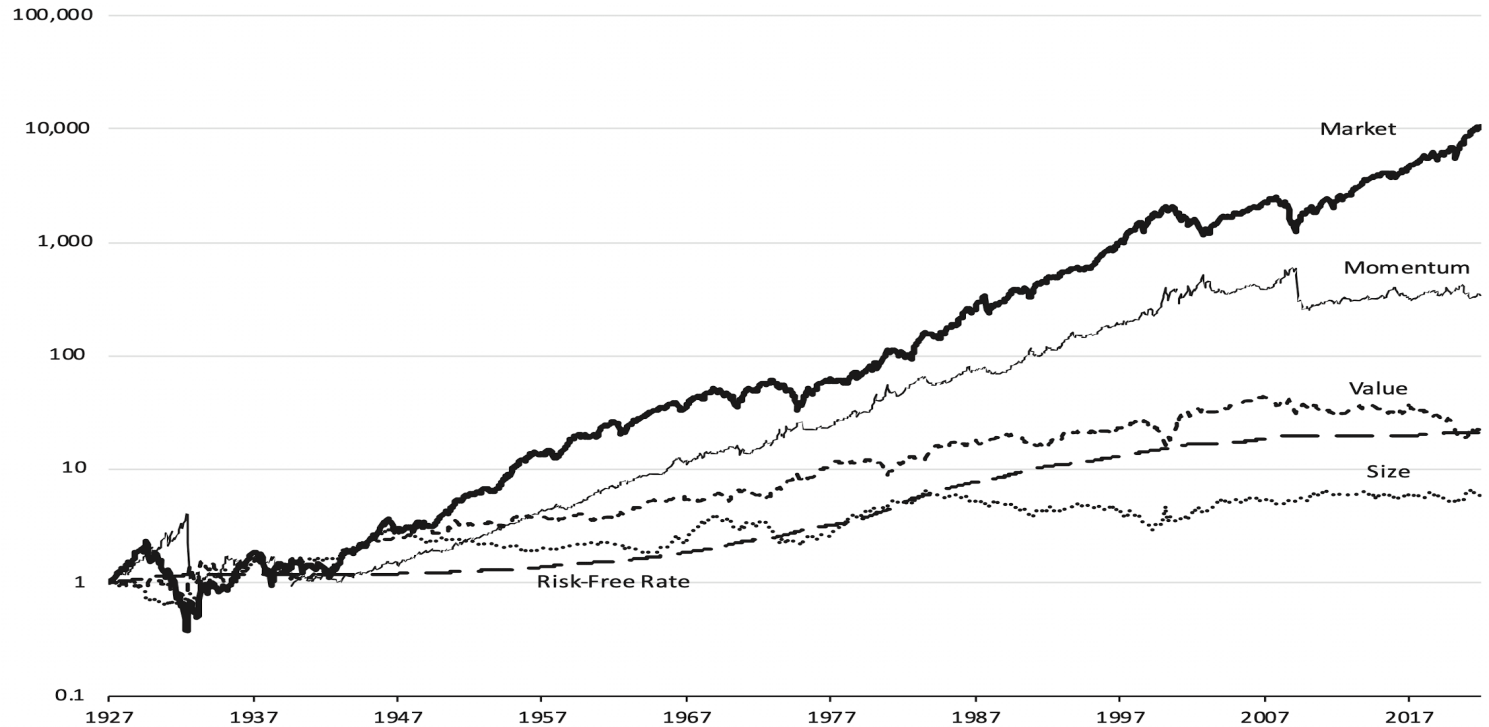
Valuing Common Stock

EXAMPLE 5. Relative Valuation

Comparable	P/E	P/BV
Apple	28.06	46.09
Nike	34.86	12.96
Alphabet Inc	22.37	5.22
Average	28.43	21.42
ABC's base	$\times$\$2.5	$\times$\$4
Eatimated value per share	\$71.07	\$85.70

Valuing Common Stock

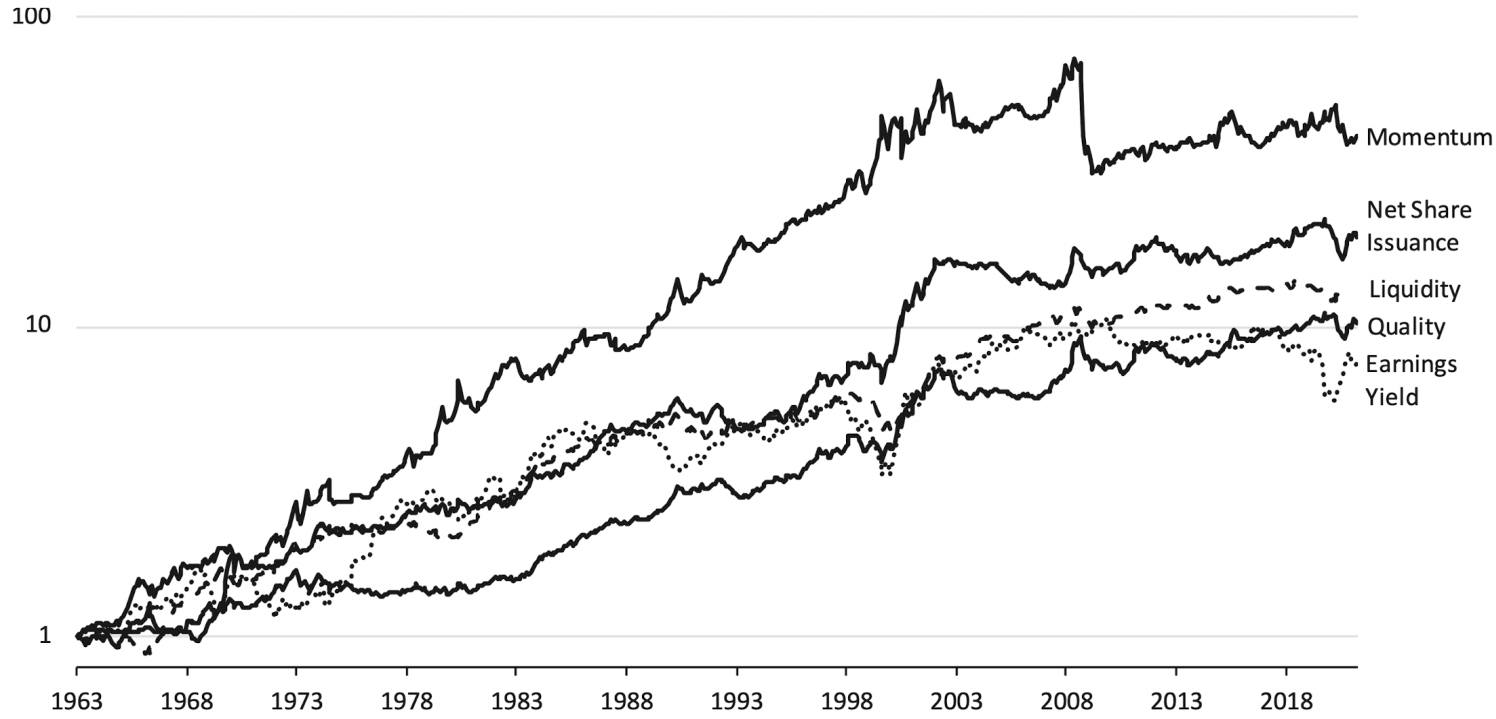
Fig 1 Major market factors: size, value, and momentum, the whole market, and the risk-free rate



This figure displays the cumulative returns from forming portfolios that take advantage of the factors valuation, size, and momentum, the latter being the tendency for stocks that have gone up or down in the previous 12 months to continue in the same direction in the following year.

Valuing Common Stock

Fig 2 Primary factors, 1963–2021



This figure shows some of the most important factor returns over the last half-century. Momentum is by far the strongest factor over the entire period, yet most have faded or disappeared completely over the period from 2006 to 2021. Many of these factors have been ineffective over much longer periods.