

If **market interest rate** increases, the price of **long-term bonds** should fall (because of lower PV of cash flows associated with the bond). The effect on general stock prices however, is uncertain.

Coupon bonds sell at a discount, if coupon rate is below market interest rate. They sell at a premium, if it is above and at face value if equal to.

Incremental Cash Flows when computing **NPV of an investment**;

- + Reduction in sales of other products (lost sales)
- + Expenditure on plant & equipment (direct costs)
- R&D costs of past years (sunk costs)
- + Annual depreciation expenses
- Dividends are not included. Whether to pay or not is a decision by itself.
- + Resale \$ of P&E at the end of project (cash inflow, taxable if > bookvalue)
- + Salaries & medical costs of all personnel connected to project.

Compute incremental net income (only inflows, not necessarily cash):
Revenue - Op. cost - Depreciation = Income before tax * (1-tax) = Net income

Compute incremental cash flows (in-/outflows, only CASH):
Revenue - Op. cost - tax - (+)Change in cash + (-)Change in cash

Calculate NPV of Cash in/outflows/(1+r)^T

Dividend rate = Dividends/Earnings

Retention rate = 1-Dividend rate

Growth rate = Retention rate * ROI

PVGO (Pres. value of growth opp.) = real share-price - NPV (Earning per share/r)

Price of treasury bill:

Maturity	Mat.	Bid	Ask	Chg	AskYld
Mar 02'00	92days	5.14	5.13	-0.03	5.27

$100\% - 5.13 \cdot (92/360) = 98.689\%$

You pay today \$9'868.90 to get \$10'000.- on Mar 02'00

AskYld = 5.27% in 360 Days (1.33% in 92 Days)

P/E Ratio (Price per share/Earnings) is related to the perceived net present value of growth opportunities. It is negatively related to the firm's discount rate and the stock's risk or variability. Firms with more conservative principles (LIFO in inflationary environment) have higher P/E ratios.

Capital gain is the change in price of the stock divided by the initial price.

Total dollar return = dividends + total capital gain (include cap. gain no matter if you sell the stock or not. Since u could realize the gain if you choose, it should be included).

The more negatively stocks are correlated, the more the SD of the portfolio decreases.

A treasury bill is a pure discount bond that matures in a year or less. It's free of any default risk (but it has some interest risk), and a very small SD, we therefore call it risk-free return over a short period. The difference between its return and a risky return is called **risk premium**.

Beta is used to measure a certain stock's contribution to the risk of a given portfolio (p.229).

It measures the responsiveness of a security to movements in the market portfolio (ie. a stock with a beta = 1.5 is expected to do 1.5 times better than the market, if the market does well and 1.5 times worse, if the market does poorly, p.256) The discount rate of a project should be the expected return on a financial asset of comparable risk (beta). Betas can change over time, for example by changes in product line, technology, market, deregulation and operating and financial **leverage** (the higher the leverage, the higher the beta, p.298). High cyclical stocks have high beta. Stocks with high variability and SD however, do not necessarily have high betas (p.301). **Operating leverage** (difference b/w variable and fixed costs, p.301) increase the effect of cyclicity on beta.

Expected Return is the average return per period a security has earned in the past.

Variance and SD is a way to measure the deviation of a security's return from its expected return and therefore a measure of the **volatility** of a security's return.

Covariance and Correlation measure the interrelationship between two securities.

As long as two securities are not perfectly correlated (corr. = 1), the SD of a *portfolio* of those two securities is less than the weighted average of the SD of the *individual securities* (**hedging/diversification, p.239**).

If the firm is **unlevered** (no debt), use **CAPM**. Otherwise use **WACC** (p.309)

Market Efficiencies (p.339): In efficient markets, prices reflect available information, there should be no way to make excess profits using available information. Financial managers should not be able to time issues of bonds and stocks, issuance of additional stock should not depress the stock's market-price, and prices should not be affected by the choice of accounting method (p.316). There exist no valuable financial opportunities at all! *There is conflicting empirical evidence on all these points!*

Weak: Prices reflect all information contained in historical data (ie. stock-selection based on patterns of past price-movements is not better than random stock-selection).

Semi-strong: In addition to historical data, prices reflect all publicly available information (investors cannot outperform the market by using publicly available information, bcs the market adjusts immediately). **Strong:** Prices reflect all information, public or private.

Difference between **expected** and **actual** return on a stock is called **abnormal return**.

Modigliani-Miller: The value of a firm cannot be changed by repackaging the firm's securities, even though debt appears to be cheaper than equity (**MM I**, assumptions: no transaction costs and individuals can borrow at the same rate as corporations). The reason is, that the equity becomes more risky (ie. more expensive), the more debt is substituted for equity (p.378).

Levered firms are riskier, bcs you only can receive returns after bondholders are paid. Therefore the expected return of a levered firm should be higher (**MM II**, p.378).

MM with taxes proposes, that each company should be 99.99% debt-financed, because the value of the firm can be increased due to tax-savings. Due to **personal taxes** (which offset the corporate tax-savings, p.411) and the costs (*not* the risk, p.397) of **bankruptcy** (and other indirect costs of financial distress (p.399)) however, firms choose to be more moderately leveraged (p.395). There are several techniques to reduce costs of financial distress: **Protective covenants, Repurchase debt prior to bankruptcy, consolidation of debt** (p.402).

The **optimal capital structure** involves a trade-off between taxes and costs of debt. If corporate taxes are higher than personal, more debt should be used. Companies with high tangible assets (land, buildings etc.; Banks/Utility) have smaller costs of financial distress than those with high intangible assets (R&D; Pharma), should therefore use more debt. Companies with uncertain operating income (Pharma, IT) may face financial distress even without debt. They should therefore choose low debt (by contrast to Utility, p.419).

NOPLAT=Net Operating Profit Less Allowance for Taxes

Growth in NOPLAT = sales growth

Accountants value items using *historical cost* (purchase price less depreciation. Finance people use *market value*.

Dividends: According to MM (assumptions on p.465), stock prices should fall on the ex-dividend date by the rate of the dividend (p.462). Due to personal-taxes however, the rate is lower than the dividend rate. Therefore, it might be better to pay any excess cash as dividends, if personal tax rates are lower than corporate (p.470). **Dividends** are relevant, ie. higher dividends are preferred if, and only if, the dividend level is held constant at every other date (of course, this only can be achieved by improving productivity, lower taxes or strengthen product marketing). **Dividend policy** however (a tradeoff between dividends at one date and dividends at another), is irrelevant (p.466), ie. a *change* in the policy does not affect the value of the stock. Firms never should give up positive NPV projects or issue new shares to increase dividend (p.467/483), because new issues of stocks increases tax payments and puts downward pressure on market price (p.468). Because stockholders prefer stability however, managers might be forced to issue stock to achieve this stability (**smoothing effect**, p.481).

Alternatives to dividend payments: Invest in negative NPV projects, acquire other companies, purchase financial assets (p.469), or **repurchasing** own shares (many of the same benefits can be conveyed without tax disadvantage, p. 472/476).

Firms with many positive NPV projects have low dividends and vice versa (p.483).

Arguments for high dividends: "Near dividends have higher value than distant dividends" (because it resolves uncertainty, is easier predictable and especially holds in a world with high broker fees and transaction costs, p.477) . "Between two companies with the same earning power and general position in an industry, the one paying higher dividends will sell at higher price" (p.476). "Dividends can be used for **Tax Arbitrage** (p.477)". "Dividend can serve as a way to reduce **Agency Costs** (p.478)". "A dividend increase is a signal that the firm is expected to do well (p.479, contrary statement on p.480)".

Three different positions on dividend (p.478):

1. MM states that dividend policy is *irrelevant* (with constant future earnings)
2. Because of tax-effects, dividends should be *as low as possible* (with constant future earnings)
3. Because of the desire for current income, tax arbitrage and agency costs, dividends should be *high*.

Stockholders in high tax brackets buy securities with low dividends and vice-versa (p.481)