**Business Finance Summary**

**Business Finance, Investors, Firms and Markets**

* Investments in assets are important because assets generate the cash flows that are needed to meet operating expenses and provide a return to owners of the business.
* Financing decisions involved generating funds internally or form external sources to the business. Such as by issuing debt or equity securities.
* Financing charges amount to non-operating cash flows
* The required rate of return caters for the costs to both shareholders and debt holders for funds committed to the project. Therefore, using the required rate of return involves the financing charges being incorporated into the discount rate NOT the Net Cash Flows.
* Fishers Separation Theorem states:
  + - Two time points: present and future
    - No uncertainty, outcome of all decisions is known now
    - No imperfections in the capital market
    - All decision makers are rational
    - Companies managers use resources according to shareholders
  + The theorem assumes that there is certainty and a frictionless capital market in which the interest rates for borrowers equals interest rate for lenders.
  + Shows a company can make a dividend/investment decision that is in the best interest of all shareholders.
  + Using ROR it is possible to show that the viability of project will depend on the ROR in respect to interest rate introduced through the capital market
  + If the interest rate is lower than both projects, then the combination of both projects is best accepted and if no combination is possible (i.e. an upgrade and another project) then both projects are accepted.
  + NPV calculates the projects REQUIRED RATE OF RETURN to convert future cash flows to their equivalent values today.

Capital rationing describes the situation where firms have limited resources and independent projects

Therefore,

IF A CAPITAL MARKET EXSISTS MANAGERS CAN MAKE A SINGLE DECISION THAT IS OPTIMAL AND MEETS SHAREHOLDERS NEEDS.

IF A CAPITAL MARKET DOESN’T EXIST SHAREHOLDERS CANNOT AGREE ON A INVESTMENT DECISION

**Accounting rate of return** - is the ratio of average annual earnings to initial outlay. Another is the ratio of average annual earnings to average investment in the project.

**Payback Period** – Time it takes an entity to recover the projects initial cash outlay. Time value of the money is not considered in the payback period.

**Capital Expenditure Process**

* Each proposal involves making current outlays in the expectation of future cash inflows, and each can be analysed as a capital-expenditure proposal
* Capital expenditures are important for a company because the amounts of money involved are large and their effects extend well into the future
* Capital expenditure involves:
  + - Generation of investment proposals
      * What is being fixed?
    - Evaluation and selection of those proposals
      * Nature of project and cash inflows/outflows
    - Approval and control of capital expenditures
      * Procedures for project development
    - Post-completion audit of investment projects
      * Provides info to enable implementation of improvements in the projects operating performance
      * Improve quality of investment decisions
      * Lead to re-evaluation and possible abandonment of unsuccessful projects
* **Independent projects** – One that may be accepted or rejected without affecting the acceptability of another project
* **NPV –** Difference between the present value of its net cash flows and its initial cash outlay.
  + -  where k = Required Rate of Return
    - Amount of positive net presents values represents the immediate increase in the companies wealth that will result from accepting the project which will increase shareholders wealth
    - **Cash Inflows** comprise of:
      * Receipts from sale of physical assets
      * Receipts from sale of goods and services
    - Cash Outflows comprise of:
      * Expenditures on materials
      * Labour
      * Indirect expenses for manufacturing, selling, administration, inventory and taxes
* **Internal rate of return (IRR)** – Rate of return that equates the present value of its net cash flows with its initial cash outlay.
  + - where r is internal rate of return

**Application of project evaluation methods**

ROR is the return that is sufficient to compensate shareholders and debt holders for the resources committed to the project. It includes both interest paid to debt holders and returns to shareholders.

INTEREST IS NOT A CASH FLOW

*Estimation of cash flows in project evaluation*

* Financing charges – Interest and dividends should not be included in the calculation of a projects net cash flow because they have already been included.

*Incremental cash flows*

* Cash flows that only occur once the project is undertaken
  + - Change once the project has been undertaken
    - Must be a cashed item
    - Two questions:
      * Is it a cashed item?
      * Will the item change if the project is undertaken

*Sunk Costs*

Costs that have already been incurred and are irrelevant for future decision making

*Allocated Costs*

Include rent, power, water, R&D etc. Allocated costs are also important, provided they represent incremental costs for accepting the project.

*Residual Value*

Disposal value of a projects assets less any dismantling and removal costs associated with the projects termination (project termination can still recover some initial capital outlay)

*Timing of Cash Flows*

Timing of cash flows can rarely be estimated precisely and the simplifying assumption that net cash flows are received at the end of the period is usually adopted.

*Inflation and Project Evaluation*

Adjust inflation to respective cash flows

*Opportunity Cost*

Highest price or rate of return that would be provided by an alternative course of action. The opportunity cost of capital is the ROR that could be earned on another investment with the same risk

**NPV Calculations for Same Life Projects**

1. **List Operating Costs**
2. **Apply tax rate** by ****
3. **This gives After-Tax Income**
4. **Establish Depreciation** as by:
   * 1. **Straight-Line**
        1. Formula is ; n= no. of years OTHERWISE the percentage as indicated.
        2. 
     2. **Reducing Balance**
        1. Formula is ; n= no. of years OTHERWISE the percentage as indicated.
        2. 
5. **List Proceeds from any sales of Items**
6. **Loss on Sale**: [ Initial Cost – Depreciation] – Sale Price
7. **Tax gain** on **Loss on Sale: Loss on sale x **
8. Figure out Cash Flow for Year:
   * 1. After Tax-Income
     2. Add-Savings on Depreciation
   1. Gives Total After-Tax Cash Flow
9. Use to establish final NPV

**Mutually Exclusive Projects with Different Lives**

Projects that have different economic lives.

Projects that involve equipment that is of different quality and therefore of different cost.

Alternative projects are not directly comparable because the difference in lives means that they involved different future cash flows.

Cash inflows and cash outflows must be equal for Constant chain of replacement

**Constant Chain of Replacement Assumption**

In order for two mutually exclusive projects to be measurable, each project is assumed to be replaced at the end of its economic life by an identical project. Otherwise it is impossible to measure two mutually exclusive projects with different lives.



; is the Equivalent Annual Value Method which involves calculating the annual cash flow of an annuity that has the same life as the project and whose present value equals the net present value of the project.

HIGHER EAV THE BETTER BECAUSE:

* + - Each project carries same risk
    - Each project therefore has same ROR

If there is inflation – future costs and cash flows will not be expected to remain the same in nominal terms, but may remain same in real terms.

Cash inflows and cash outflows must be equal for Constant chain of replacement

*Problems with Chain of Replacement & Assumption*

Machines and services provided are identical in every way.

Replacements can be many years into future and since cash flows are discounted to PV, reduces impact of above assumptions

**Mutually Exclusive Projects**

Figure out NPV by using 

Then 

Then 

HIGHER EAV THE BETTER BECAUSE:

* + - Each project carries same risk
    - Each project therefore has same ROR

THEN TOTAL NPV (i.e. add in any extra costs of sales)

**Retiring a Project**

Periodic review of a project must take place to ensure it is still viable.

**Retirement Decisions**

A project should be retired if the net present value of all its future cash flows is less than zero.

i.e.

|  |  |  |
| --- | --- | --- |
| **End of Year** | **Net Cash Flow** | **Residual Value** |
| 6 | $ - | $ 12,000.00 |
| 7 | $ 8,000.00 | $ 6,000.00 |
| 8 | $ 5,000.00 | $ - |

End of Year 7 yields:

 - NPV still positive so don’t retire yet

End Year Eight Yields:

 - NPV now negative

Therefore retire machine at end of year 7

**Replacement Decisions**

The retirement decision was where an existing project was replaced with an identical project.

Now we are replacing an existing project with a completely new one that has different cash flows.

The following steps are required for **simulation** analysis:

~ specification of probability distribution of variables

~ calculation of correlation between the variables

~ computer analysis

~ only done to LARGE projects because of costs involved of setting up above 3

**Examples**

Project investment worth $1000. Cash flows for 3 years of $500. Prices are expected to rise by 10% with an ROR of 15%. What is NPV?



**Overview of methods other than NPV and their weakness’**

**Internal Rate of Return**

Equates the present value of projected cash flows with the initial cash outlay.



Internal rate of return is the discount rate that results in a zero net present value.

It is the maximum interest an investor could afford to pay before losing money.

If the equation shows that the present value of net cash flows is greater than the initial cash outlay, then some higher discount rate should make them equal, and vice versa.

If the IRR > RRR PROCEED

If the IRR < RRR DON’T PROCEED.

**This method is consistent with maximising shareholders wealth. If the RRR is the minium return that investors demand then (all things equal) accepting a project with an IRR greater than the RRR should result in an increase in the price of a companies shares.**

A problem with IRR is that there may be more than one solution if future cash flows are negative.

**Independent Investments**

If a project has a IRR > RRR, the project will have a positive net present value when its cash flows are discounted at the RRR. Such that:

* + - * NPV > 0 when r > k
      * NPV < 0 when r < k
      * NPV = 0 when r = k

**Mutually Exclusive Projects**

Acceptance of one project, implies rejection of the other project and vice-versa.

The difference in rankings caused by NPV and IRR methods is due to the magnitude of net cash flows and the lives of the projects. This can be overcome by:

* Incremental cash flow rate
  + - Project A (lower IRR) rather than Project B (higher IRR)
      * CASH FLOW A – CASH FLOW B and get new IRR on this (A – B) cash flow
        + If IRR > RRR for (A-B) then accept project

**However, the NPV method is superior to the IRR method because the NPV method always gives a WEALTH-MAXIMISING DECISION because it is expressed in ADSOLUTE DOLLAR TERMS RATHER THAN PERCENTAGES. (differences between the projects is usually because of timing of CF’s)**

**Benefits Cost Ratio (BCR)**

Dividing the present value of the future net cash flows by the initial cash outlay



If the:

* BCR > 1 – Project will have a positive NPV
* BCR < 1 – Project will have a negative NPV

**This method adds no new information to that already provided by the NPV – it is rejected because it can RANK PROJECTS WITH A LOWER NPV HIGHER:**

**AND THIS IS NOT A WEALTH-MAXIMISING DECISION.**

**Accounting Rate of Return**

Earnings from a project – after deducting depreciation and income tax – as a percentage of investment outlay. If the:

* ARR > RRR = Accept Project
* ARR < RRR = Reject Project

There are three variants of ARR shown in the example below:

**Initial Investment = $10 000**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **1** | **2** | **3** | **Average** |
| Earnings (After dep and tax) | 2000 | 3000 | 4000 | 3000 |
| **Book Value $$** |  |  |  |  |
| 1-Jan | 10000 | 70000 | 4900 |  |
| 31-Dec | 7000 | 49000 | 3430 |  |
| **Average** | 8500 | 5950 | 4165 | 6205 |

*ARR based on Initial Investment:*

****

*ARR based on average book value:*

****

*ARR based on initial & final capital value*

****

**Two main problems with ARR:**

* **Arbitrary –** Based on accounting earnings and depreciation and valuing inventories will have substantial impact on ARR
* **Ignores timing of cash flows –** Time value of money is not taken into account(two projects may average out even if earnings over time are different)

**Payback Period**

Time taken for the initial cash outlay on a project to be recovered from the projects net cash flows. Calculated by summing the net cash flows from a project in successive years until the total is equal to the initial cash outlay.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Project A** | | **Project B** | |
| **Year** | **Initial Cash Outlay** | **Net CashFlow** | **Initial Cash Outlay** | **Net CashFlow** |
| 0 | 10000 |  | 10000 |  |
| 1 |  | 2000 |  | 2000 |
| 2 |  | 3000 |  | 4000 |
| 3 |  | 3000 |  | 4000 |
| 4 |  | 2000 |  | 1000 |
| 5 |  | 7000 |  | 1000 |
| **Total** |  | **17000** |  | **12000** |
| Payback Period |  | 4 yrs |  | 3 yrs |

Projects are accepted if the payback period is less than some given period.

**Three main problems with payback period are:**

* Timing of cash flows is not incorporated
* Biased against projects with large cash flows rate later in there lives (i.e. faster a project gets money the quicker the payback period)
* Does not measure profitability or shareholder wealth.

**Risk, Valuation and Investment: Portfolio Theory and Asset Pricing**

**Return and Risk**

Risk is present whenever an investor is uncertain about the future outcome of an investment. If a probability is assigned to each dollar return from an investment, a list of returns from each investment is available. Such that:



**Expected Rate of Return**

The size of the dollar returns is measured by the expected value of the distribution.

|  |  |
| --- | --- |
| **Dollar Return, Ri** | **Profitability, Pi** |
| 9 | 0.1 |
| 10 | 0.2 |
| 11 | 0.4 |
| 12 | 0.2 |
| 13 | 0.1 |



E(R) = (9 x 0.1) + (10 x 0.2) + (11 x 0.3) + (12 x 0.2) + (13 x 0.1) = $11

*RISK* **–** It is related to dispersion of the distribution because if the investor had perfect foresight then there would be no need for a distribution as 1 outcome would only be considered.

**Variance**

Variance is the weighted average of the square of each dollar returns deviation from the expected dollars return.



And using the above values equates to:



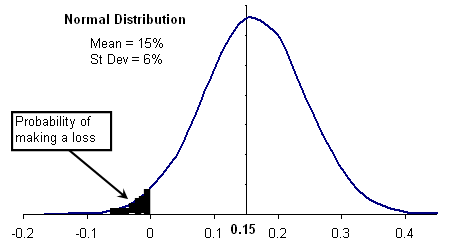
Whereby the *Standard Deviation* is the average distance from the overall mean.

**Normal Distribution**

Assuming that returns follow a normal probability distribution, the area under the standard normal cure can be used to calculate the probability that the investment will generate a return greater than or less than any specified return.

**For example:**

Assume an analyst estimates that an investment has an annual expected return of 15% and standard deviation (risk) of 6%. What is the probability of making a loss?

****

The **Z-score** (standardised value) is:



From a table of Standard Normal probabilities it can be concluded that:



**Investors Utility**

It is possible to have two investments with the same expected return but different risk.

Investment B

Investment A

Investment B is more risky, the dispersion about the mean is greater, than for investment A. An investor who prefers to invest in A is *risk averse*. That investor achieves greater *utility* (satisfaction, happiness) by choosing a lower-risk investment.

If an investor is indifferent between investments A and B, then that investor is said to be *risk neutral*. If an investor prefers investment B, then that investor is said to be *risk seeking*.

**Investors Utility**

Utility

Risk Seeking

Risk Neutral

Risk Averse

*Wealth*

A risk-adverse investor attaches decreasing utility to each increment in wealth

A risk-neutral investor attaches equal utility to each increment in wealth

A risk-seeking investor attaches increasing utility to each increment in wealth

**Covariance & Correlation**

The strength of the relationship between two random variables namely:

 and 

If **COV(X,Y) > 0** then there is **Positive Correlation**

If **COV(X,Y) = 0** then there is **Neutral Correlation**

If **COV(X,Y) < 0** then there is **Negative Correlation**

**Covariance** between two random variables is given by:



Where:  is the *i th* return on an investment X

 is the *i th* return on an investment Y

 is the joint probabilities of the two returns

**Correlation co-efficient** between two random varies is given by:

*How the X variable affects Y – the stronger the correlation, the better x predicts y*

****

An important property of  is : 

**Note:**

=1, if X increases, Y always increases

= -1, if X increases, Y always decreases

= 0, there is no relationship between X and Y

0 < < 1, if X increases, Y usually increases

-1 < < 0, if X increases, Y usually decreases

**Portfolio Theory**

Assumptions are that:

* Asset returns are normally distributed
* Investors are risk averse *(highest expected return for a given standard deviation and the lowest standard deviation for a given expected return)*

Expected return from a portfolio is the weighted average of the expected return from each of the individual assets. Such that:



Where:  is the expected portfolio return

 is the expected return from the *i th* asset

 is the weight of asset *i* in the portfolio



*n* is the number of assets in the portfolio

**Portfolio Risk**

It can be shown that the **PORTFOLIO RISK** of a **2 ASSET** portfolio involving security X and security Y is given by:



*Whereby Portfolio Risk depends on:*

* The asset weightings within the portfolio
* The individual assets risk level
* The correlation between asset returns within the portfolio

A portfolio is at higher risk when the correlations are higher

Want low correlations between portfolios

Therefore maintaining expected returns whilst minimising risk

(Higher Correlation Higher Risk – Lower Correlation Lower Risk)

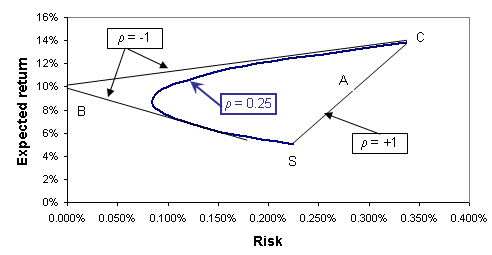
Correlation coefficients are ultimately determined by the market.

Get around this by controlling the weightings of each security held within the portfolio.

Changing the weightings also changes the expected return and therefore we refer to the **EFFICIENT FRONTIER**.

*(Degree of risk reduction increase as the correlation co-efficient between returns on two securities decreases)*

**Efficient Frontier**



Risk return combinations for different values of the correlation coefficient.

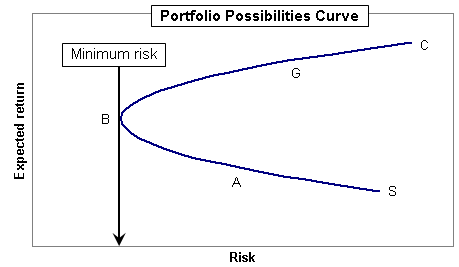
The curve segment SBC represents ρ = -1.

The curve segment SAC represents ρ = +1.

The interior curve represents ρ = +0.25

As ρ decreases the interior curve is pulled in the direction of zero risk, when ρ increases, risk increases.

The smaller ρ is, the greater is the benefit from combining assets in a portfolio.



That portion of the Portfolio Possibilities Curve that lies above the minimum risk portfolio is concave while that which lies below this point is convex. This is a general characteristic of all portfolios.

A rational investor would not choose a point in the segment BAS since a higher return may be achieved for the same risk. The segment BAS may be ignored, or deleted, since it will never be used. BGC is the efficient frontier

This assume that all investors are utility maximisers and wish to gain HIGHER RETURNS FOR LOWER RISK.

**Diversification and Multiple Assets**

Diversification provides the following benefits:

* Two securities that are perfectly positively correlated (p=1) results only in risk averaging, and does not provide any risk reduction.
* Real advantages of diversification are from combining two securities whose returns are less than perfectly positively correlated.
* Risk reduction increases as the correlation coefficient between the returns on the two securities decreases, up to where both securities are perfectively negatively correlated (p= -1).

**Multiple Assets**

A set of:



**Example**:

**Asset Weight E[Ri] σi**

R1 0.2 0.10 0.100

R2 0.5 0.15 0.095

R3 0.3 0.06 0.152

That is:

ρ12 = ρ21 = 0

ρ23 = ρ32 = -0.04

ρ13 = ρ31 = 0.2

**Correlation matrix:**

****

****

****

****

**= 0.113**

**Portfolio Risk on Multiple Assets is as follows**





The risk of the portfolio with multiple assets is given by:

 (0.2)2(0.10)2 + (0.5)2(0.095)2 + (0.3)2(0.152)2

+ 2(0.2)(0.5)(***0***)(0.10)(0.095) (2W1W2ρ12σ1σ2)

+ 2(0.2)(0.3)(***0.2***)(0.10)(0.152) (2W1W3ρ13σ1σ3)

+ 2(0.5)(0.3)(***-0.04***)(0.095)(0.152) (2W2W3ρ23σ2σ3)

 0.00057 + 0 + 0.004 – 0.0002 = 0.000762



**How much Diversification?**

If a portfolio has n assets, the same correlation and same variance  then *portfolio risk* can be given by:



As *n* increases the portfolio decreases in risk.

Setting *n* = ∞ then the portfolio risk is given by In other words, it doesn’t matter how many assets are included in the portfolio, risk can never be completely be eliminated.

**Systematic and Unsystematic Risk**



**Total risk**

**Unsystematic or diversifiable risk**

**Systematic or non-diversifiable risk**

N

(number of securities)

**Unsystematic Risk** – Component of total risk which is unique to the firm and **may be**

eliminated by diversification

**Systematic Risk** – Component of total risk which is due to economy wide factors and

**cannot** be eliminated by diversification (such as interest rates, tax

laws etc)

*Most unsystematic risk is removed by holding a portfolio of 25 to 30 securities.*

Portfolio risk can be reduced by diversification, but not all risk can be diversified away because some of it is driven by systematic risk.

The market portfolio is approximated by the weighted average of the companies *(i.e. All Ords and S&P 500)*

**Risk & Return**

Investors should be compensated for bearing systematic risk and therefore there must be a relationship between returns and systematic risk.

Risk free assets include *Bank Accepted Bills* and *Government Bonds*, as they have a predetermined return and therefore no risk.

A risk free asset combined with a risky asset is determined by:



= weight of the risk-free asset in the portfolio

σi = risk associated with the risky asset

σp = risk of portfolio

**Example**

A risky portfolio has a risk of . A government bond returns 6% pa. What weighting of the risky and risk-free asset will create a new portfolio with a risk of 5%.



Hence 37.5% of the portfolio consists of the risk-free asset and the balance, 62.5%, consists of the risky asset.

**risk**

**σP**

**E[RP]**

**Rf**

**A**

•

All funds are invested in the risk-free asset, that is = 100%, the return achieved is R**f** with zero risk. Combining the risk-free asset with a risky asset provides the investor with the opportunity for higher returns to compensate for the risk exposure. If borrowing does not occur, the efficient frontier is represented by the line segment R**f**A on the diagram. Over this frontier some proportion of the investor’s funds are invested in the riskless security, that is > 0. The most risky portfolio (with no borrowing) is portfolio A, consisting only of risky securities, = 0.

Investors maximise expected returns by holding a portfolio with of the risk free asset and 1 - of portfolio M.

**The Capital Market Line**

Any combination of the risk-free and risky assets where 0 < ≤ 1 will result in funds being placed in the riskless asset, that is, the investor is lending money at the rate Rf.

The investor may either borrow or lend at the riskless rate. Borrowing means that < 0.The expected return on a portfolio consisting of the **riskless asset** and **portfolio A** is,



Note that this is the equation of a straight line. All combinations of riskless lending and borrowing with portfolio ***A*** lie on a straight line in expected return standard deviation space.

Intercept:  Slope: 

The line passes through the point ()

Borrowing

**E[RP]**

Lending

**E[RA]**

**Rf**

**risk**

**σP**

**σA**

To the left of point A we have combinations of lending and portfolio A.

**Capital Market Line (CML)** describes all efficient portfolios and the return on an efficient portfolio is given by:

* The market price of time, plus
* The market price of risk X the amount of risk on an efficient portfolio.

CML explains relationship between risk and return for efficient portfolios.

**The Capital Asset Pricing Model (CAPM)**

Security Market Line shows that return is an increasing linearly function of risk. It is only market risk that affects returns for bearing diversifiable risk. It models the relationship between risk and return for efficient and inefficient portfolios as well as individual assets.



*Risk-Free Rate* *Risk Premium*

Where  ;  is the risk of the ***i***th asset;

 is the covariance of returns between asset ***i*** and the market

portfolio and .

The *Security Market Line* show the relationship between expected returns for a security and its beta.

The SML describes the expected return for all assets and portfolios of assets in the economy.

The expected return for any asset, or portfolio, whether it is efficient or not, may be determined from this relationship.

The relationship between expected return on any two assets can be related simply to the differences in their betas.

**M**

risk

β

E[RP]

R**f**

β = 1

E[RM]

**Beta** (β) is the ratio between portfolio risk to market risk.

 the portfolio has the same risk as the market portfolio

 the portfolio has less risk than the market portfolio

 portfolio risk is greater than the market portfolio

= 0 portfolio has zero systematic risk, and is riskless

KEY ASSUMPTION OF CAPM is that investors make decisions based upon the expected return and risk of a security only.

A number of studies have found returns to ‘fat tails’ relative to the normal distribution.

Normal

Fat tailed

E[R]

Portfolios with  tended to earn higher returns than predicted by CAPM Portfolios with  tended to earn lower returns than predicted by CAPM.

Theoretical SML

E[R]

E[RM]

R**f**

β

β = 1

Empirical SML

**Arbitrage Pricing Theory**

APT replaces the market portfolio with a number of micro and macro economic factors.

Difficult to implement because of lack of data and does not explain market anomalies

* ***INVESTORS ARE RISK AVERSE***
* ***INVESTORS REQURIE A RISK PREMIUM TO INVEST IN RISKY ASSETS***
* ***INVESTORS CAN DIVERSIFY UNSYSTEMATIC RISK OUT OF A PORTFOLIO***

**Efficient Markets**

Efficient Market Hypothesis (EMH) is that the value of a share does in fact equal its market price. If market is not efficient, investor will exploit the under/over pricing of a share to make an abnormal profit.

*EMH STATES THAT PRICES WILL REACT TO NEW INFORMATION RAPIDLY AND UNBIASED.*

Two Strategies:

* **Technical Analysis:**
  + - * + Prices have behave in certain patterns in the past and will do so again in the future.
        + Volume of trade indicates the strength of investor belief as to what is a fair price. Higher volume, implies higher belief that the current price is not fair.
* **Fundamental Analysis:**
  + - * + Assessing the underlying or intrinsic value of a firm and then comparing this value with market value.
        + If intrinsic value > market value then trader should buy this security.

The market price of a security reverts back towards its intrinsic value and traders can exploit this difference.

A capital market is *informationally efficient* if:

* Prices are unbiased (price = value)
* Prices react immediately to new information
  + Therefore, no abnormal profits can be made in this market.

Information efficiency in a capital market is in three forms:

* *Weak form efficiency* – Information contained in the past series of prices of a security are reflected in the current market price.
* *Semi-strong form efficiency* – Public information is immediately incorporated into prices and there is no way to earn abnormal profits by trading on this information.
* *Strong Form Efficiency –* All information, private and public, is reflected in the current market share price.

Empirical Testing of:

* *Weak form efficiency* – No evidence to suggest against the hypothesis that financial markets are weakly efficient as profits are offset by transaction costs.
* *Semi-strong form efficiency* – Security changes around events such as:
  + - * Profit Announcements
      * Dividend Announcements
      * Takeovers
      * Audit qualifications

**Market model of expected returns**:



**Abnormal Returns:**



Abnormal returns is used to calculate abnormal returns generated from dividend announcements etc.

* *Strong Form Efficiency –* Financial markets may not be efficient with respect to private information and therefore there is inconsistency with abnormal profits.

**Capital Market Anomalies**

*Firm Size Affect* – Small firms consistently outperform large firms in share market.

*Monthly Seasonality* – Larger returns in January, low returns in June/July

*Monthly Size Effect* – Firm size affect is larger in January

*Day of Week Effect* – Monday is lower than Friday

*Price/Earnings Effect* – Firms with low P/E rations consistently outperform firms with

high P/E ratios.

*Holiday Effect* – Average returns higher on trading day following a holiday.

***Market Inefficiency*** – Abnormal returns can be earned because of firm size, month,

day of week etc appears to be evidence that market is

inefficient.

***Economic Explanations*** –

* + - * *Tax Loss* – traders sell securities at end of year which

have lost value for taxation purposes

(Dec31st in US)

* + - * *Firm Size* – Liquidity, total risk, transaction costs
      * *Settlement Periods*
      * *Portfolio rebalancing*

***Systematic Experimental Error*** –

* + - * Thin trading
      * Bid-ask spread

**Company Cost of Capital**

**Problems:**

*Assumption of dividend growth in perpetuity* –

If don’t grow at constant rate, cost of equity capital is discounted incorrectly on estimated future dividends meaning they equate to current share prices. This will over/understate cost of capital.

*Assumption of ex-dividend* – If not the case, cost of equity capital is based on discounting future expected dividends to current share price which is incorrect as it still incorporates the dividend.

**Company cost of *Equity* Capital**

*Dividend Growth Model (DGM)*



**FULLY FRANKED SHARES carry a tax credit:**



**Problems:**

Based wholly on systematic Risk

Derived from CML and therefore may said to be correct when it isn’t

Very hard to establish an accurate market portfolio

*The CAPM*



**Company cost of *Debt* Capital**

Crude methods used:

* + - Debt is risk-free
    - Dividing firms *net interest* by *average net debt*
      * *Net interest* = Interest paid – Interest Received
      * *Average Net Debt* = Debt – Cash

**EQUATION = AVERAGE COST OF FIRMS DEBT**

**Weighted Average Cost of Capital (WACC)**

Weighted average cost of equity and debt capital:

**Problems:**

WACC inappropriate for a measure of risk for diversified companies because it measures the expected return for the overall company, giving the average systematic risk across all divisions. CAPM will measure risk-matched discount rate for each division.



**Overall Capital Costs**



**Cost of Capital**

Cost of EQUITY Capital is estimated using FUTURE expected dividend growth

Cost of DEBT Capital is estimated using THE MARKET VALUE (not BALANCE SHEET) of debt.

WACC should be estimated by CORRESPONDING (not balance sheet) MARKET VALUE WEIGHTS to the costs of equity and debt capital.

Assumptions made on CAPM:

* quoted share price is ex div
* share price represents an equilibrium value in an efficient market
* dividend growth rate is expected to remain constant in perpetuity

Generally speaking we would not expect the equity/dividend valuation model and the CAPM to give very similar estimates for the Company’s overall cost of capital (WACC) because:

* the simplified version of the equity valuation model (used in this question) unrealistically assumes constant dividend growth in perpetuity
* the equity valuation model produces a multi-time period return whilst the CAPM produces a single-time period return

**Dividend**

The dividend valuation model indicates:

* The market value of a company’s shares
* The discounted sum of the future dividend stream that will accrue.

If management pays:

* High level of dividends, low proportion of distributable cash flow

Return will be in dividends

* High proportion of distributable cash flow, low level of dividends

Return will be capital gains.

**Imperfect Market Thoery**

* Unlikely to be perfectively informed of company about circumstances in the companies decision to REDUCE DIVIDENDS
* **Signalling theory** – Shareholders will consider pessimistic information about company if there is incomplete information about dividends
* Shareholders will consider there is more systematic risk about company and shall price will fall

**Tax-based Clientele Theory**

* Shareholders group according to different tax classes for dividends
* Composition of shareholder base is partially determined by personal tax of shareholders and levels of dividends paid instead of capital gain
* Personal tax less < Corporate rate will recieve MOST VALUE from using imputation credits and therefore they will want maximum franked dividends
* Personal tax > corporate tax rate: it will depend on the tax structure of the shareholder at the time of dividend payment
* Consistent dividend policy will ensure a unique group of equity holders and satisfied with respective dividend returns

**Modigliani and Miller dividend irrelevancy argument**

* Shareholders not care how dividends and capital gains are distributed in a perfect capital market world of no taxes and transaction costs.
* Dividend policy would be irrelevant because it would not affect shareholder wealth.

**Factors that INFLUENCE DIVIDEND POLICY:**

Prudence –

* Dividends must be budgeted for as an integral part of the cash flow forecast, and (if necessary) further funds obtained for the purpose of dividend payments

Company funding requirements –

* Dividends can only be paid regularly where the company is inherently profitable
* Good dividend policy is stability and consistency
* Variable dividends are uncertain dividends, increasing shareholder scepticism
* A company with ready access to capital markets may in practice prefer a high pay out policy coupled with regular share issues, rather than keep dividends deliberately low to provide a large pool of retained cash

Regard for individual shareholder requirements -

* The objective of company management is to follow a policy of maximising the wealth of shareholders.
* A high retentions policy is commensurate with high capital growth in share value, whereas as a high pay out will benefit shareholders requiring a high income.
* Small companies tax considerations may well play an extremely important part in setting dividend policy.