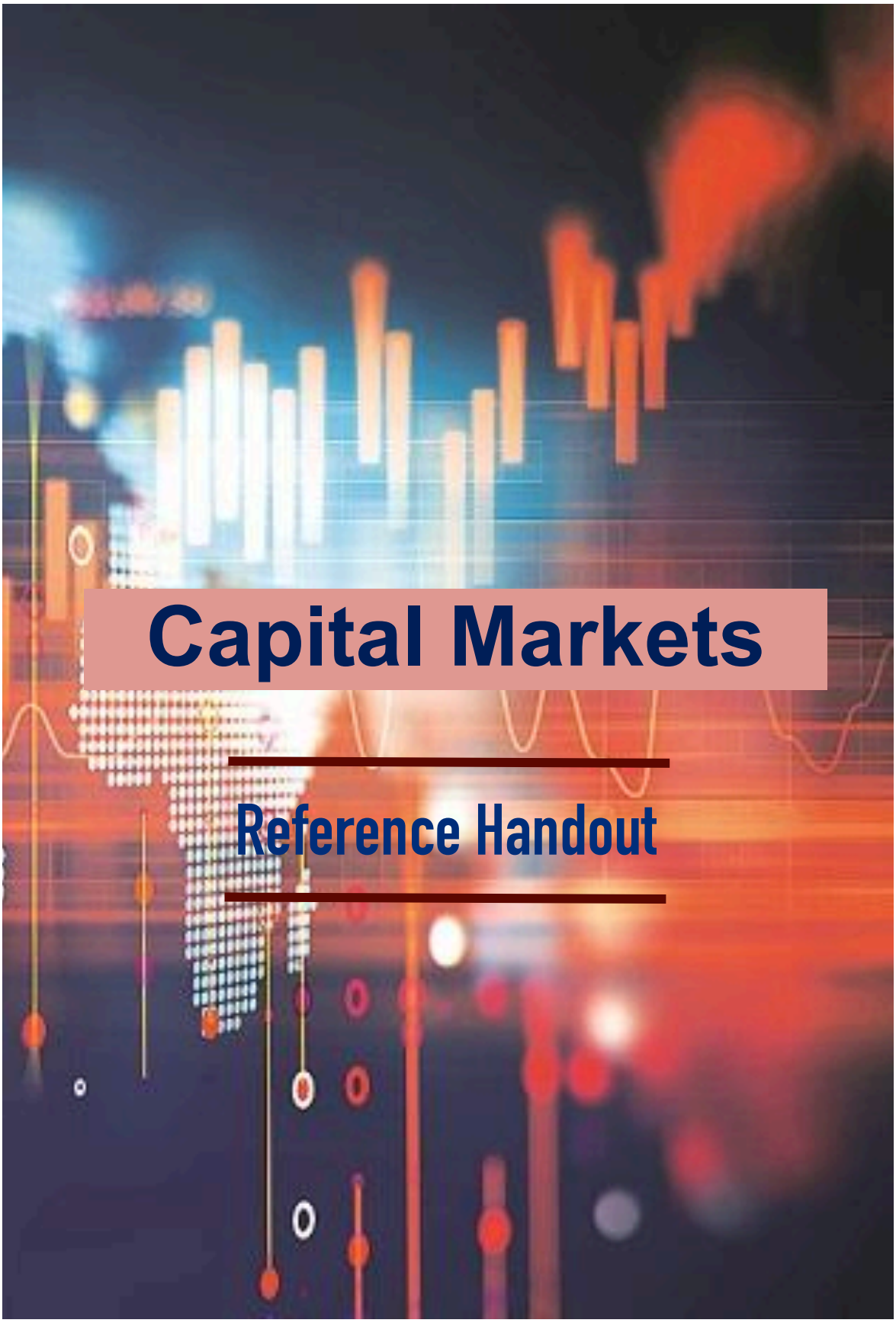

Capital Markets

Reference Handout

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Main ToC

A Deeper Understanding of Markets
Reference Material

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An illustration of Jonathan's Coffee House in London: where the modern concept of the Stock Exchange was developed over time. The first one is of course, The London Stock Exchange.

The Origin of Markets

A group of adventurous traders in the city of London decided to set forth in a ship for the far-off land known as India. It was then a land of milk and honey and Indians are all too familiar from schoolbooks of this glorious past of which no trace of evidence remains. Exotic silks, spices, gems and treasure troves were all too alluring.

Cardamom, cinnamon, cloves, tea and pepper were luxury goods when first discovered. At first, the price per unit was worth a prince's ransom. Later the sheer volume of trade made the business hugely profitable. Kingdoms and Empires came to be built on these products. A fascinating account of the evolution of world trade is to be found in the book titled "How Trade Shaped the World" by William Bernstein.

With such dreams in their sights, this group of traders needed to fund their adventure. You need to buy a ship, hire men, carry cash (in gold), run the risk of perils of the sea, pirates and acts of god to go all the way to India, come back running those same risks. If you did this successfully, the rewards were awesome!

But where to get the money? That too, for such a risky venture? The adventurers (we can imagine) sat at the local coffee shop talking about such grandiose plans. One of the friends around the table told them of a rich man he knew who might be interested in this proposition.

So off they went to see the rich man. They told him of the great opportunity and how any one investing in this venture (adventure) would reap huge rewards. The rich man heard them out and asked how he would benefit from the venture.

"Well, sir, when we get back, we will report to you on how much profits we made. Since you fund the venture you own a large part of it.

We own the other part of it for actually travelling and doing all the hard work!". And the rich man said: "Sounds good. How do I know you will stick to this promise?"

"Well, sir, we have a common friend here who will vouch for the fact that we will not sail away with your money. As for the promise, we will write it on a parchment that you own this enterprise to extent of the money you give us."

The rich man wanted to know when he would get his original amount back. The traders told him that all he would get was profits from the venture. His original money got him ownership of the enterprise itself. The friend interjected. He told his rich friend, “Look, if the venture does well there will be others who will be interested in buying-in into buy into this enterprise. You can always sell that certificate of ownership which we give you to the buying person in exchange for money. In fact, we expect our venture to do so well that you can sell the certificate for more than what you paid!”

“All of this sounds perfect,” said the rich man. “In fact, too good to be true! When I, the richest man in London find it so difficult to buy into this, how can I be certain of finding someone else to buy from me?”

To this the friend said, “Sir. If there is no one else willing to buy, I will buy from you. You can always find me at Jonathan’s Coffee House on Exchange Alley.” And the friend added that if no one else were willing to sell on a given day then he would sell.

And thus, was sown, from private funding the seeds of the enterprise that eventually became the Crown in the Jewel of the British Empire. Of course, the story narrated above is not to be found in any history book and liberally fictionalized; but it is not far from how things started out. Let us see where each part of the story fits what we know of capital markets today.

The money required for the venture is of course the term we previously defined as capital.

The adventurers are promoters. The entity of which they promised ownership is now known as the ‘company’.

The friend who took them to see the ‘rich man’ is the investment banker.

Promising to buy and sell when no one else would was a much-needed way of instilling confidence in the new proposition of tradable ownership of an enterprise. This is the origin of the term market making. The market maker is often the original friend who brought the deal to the investor: after all, if the person who brought the deal is himself not willing to back the deal, then who will?

We, thus, quite often find the term market maker used interchangeably with investment banker; Or in the same breath; Or in the same context. This evolutionary context also helps us understand why some brokers/ intermediaries/investment bankers also buy and sell for their own account (using their own money) and do not just execute client orders with client money.

Paternoster Square, where LSE is now located.

The paper on which the traders wrote out the promise of ownership is the share certificate. It is now referred as equity, common stock or simply shares. While each of these terms has a history to them, in the modern context they are interchangeable terms, and all mean the same thing: they represent ownership of an enterprise.

In the modern world the investor, the rich man, need not be all that rich. It just takes a small amount to be the owner of one of several shares in a company. It is quite hard to visualise that the stock market, which today is electronic, and a high-speed operation has its origins in a shaky, none-too-certain fashion.

That leads us to examine what the Capital Market is!

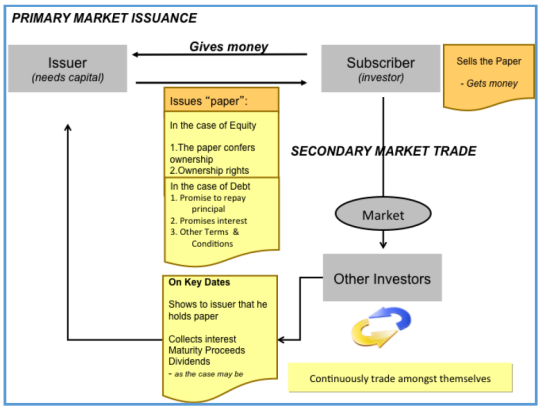
The Capital Market

As the term suggests this is the market for Capital.

Capital – in the context - refers to long-term money which is available for deploying into a project or enterprise. The project is expected to turn profitable and generate enough cash to justify the project. But this

is going to take a long period: at a minimum three years. By not specifying how long that period can be one conveys the idea that long term funding can be 'permanent' in nature. If a person funds a venture for such a long period of time that it borders on the permanent, he is in essence the owner of the enterprise.

Primary Markets are the markets of first issuance. Secondary Markets are the markets for trading that provide liquidity to investors. The accompanying chart below neatly captures the entire flow of the markets:



Global Markets / Investment Banking

Investment Banking is a Capital Market activity. It has nothing to do with Commercial Banking by nature. At the commercial bank, depositors seek low risk and hold the bank answerable for their moneys; an Investment Bank plays an intermediary role; and both sides to the deal or transaction must assess the risks for themselves.

The intermediary role of an Investment Bank arises from the need of businesses for long term capital as seen in the preceding short narrative. While Commercial Banks provide businesses with certain forms of longer-term capital such as term loans, the really long-term needs cannot be met by banks. Nor can Commercial Banks provide 'risk capital'.

The ultimate need for long-term capital is the need for equity, where the current owner of a business seeks other, newer owners (investors) to join in investing capital in the business. These newer owners might be private groups (individuals or institutional) or members of society at large. If the investment is sought privately it is called a 'private placement'. If the investment is sought from the public at large it is called a public issue or public offering.

Another form of long-term capital is debt or loans. The borrowing organization issues paper containing promises to pay interest and repay the loan amount and. These basic promises together with other terms and conditions constitute the paper known as 'bonds' or 'fixed income securities'.

Investment Banks provide the service of helping entities raise equity and debt. In doing so, the Investment Bank assesses the business proposition being made by the entity raising capital (the Issuer). Ideally, the Investment Bank must take on such assignments only if the business proposition is worthy.

The investing public is supposed to judge an Investment Bank by the quality of the deals it brings to the market and this reputation is precious to the Investment Bank.

Investment Banks earn a fee from the capital raiser for this work which can range from to 4% to 6% of the amount raised. Certain deals which are high profile and trophies are competed for by multiple Investment Banks; on such deals the fees tend to be lower as an outcome of price competition.

Sometimes, when an issue of shares or bonds is available at a very attractive price compared to the future prospects for that company, the Investment Bank might invest its own capital in the deal. In such cases, if the future price turns out as anticipated, the Investment Bank makes additional investment profits on the deal, beyond the percentage fee it charged for raising money.

Investment Banks also engage in Underwriting public issues. Underwriting is a commitment if the investing public does not pick up enough of the Issue, the Underwriter will pick up some or all of

A representative list of some of the top Investment Banks of the world. These are in the 'bulge bracket': large ones.

the shortfall. The Investment Bank/Underwriter earns an underwriting fee for such commitments.

Merchant Banking, strictly speaking is not a separate activity. When the Investment Banker does not invest its own capital in a deal, and merely takes it to the market on behalf of the capital raiser (Issuer) that can be termed as Merchant Banking activity. In some countries the term Merchant Banking and Investment Banking are used interchangeably.

Internationally, an Investment Bank takes deals to markets; in some deals it puts its own capital and in others it does not.

Investment Banks also have brokerage desks. These brokerage desks help customers complete transactions of customers in the markets. Brokerage earns the Investment Bank commissions.

Investment Bank sometimes trade on their own account as well. In some economies (like India) every trade must be routed by a broker to a stock exchange at which it is a member. However, there is no corresponding restriction in major markets like US, UK and the European Union (which is a grouping of 27 countries).

In such situations, the Investment Bank might buy what a customer wants to sell at a given price, if it thinks the customer is seeking a price on which it can make a profit. The same is true of the situations in which the customer is buying; if the price is

This merger was large as well as successful. It was advised by UBS, Goldman Sachs and Davis Polk & Wardwell, the last being a specialist, boutique Investment Bank.

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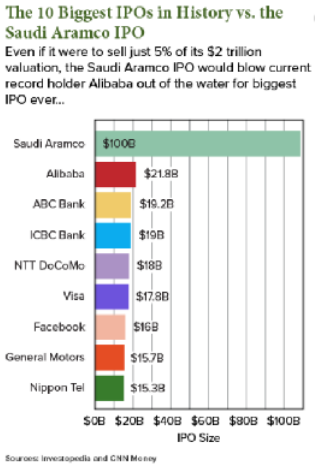
such that the Investment Bank anticipates extra profit, it may sell the security from its own holdings to that customer.



For Investment Banks, one of the large groups of potential clients are the insurance companies, pension funds, mutual funds and other fund managers. These entities are provided investment research and advice by Investment Banks. These entities are the source of a large proportion of the buy and sell orders that they get at the brokerage desk.

From this perspective an Investment Bank is a “Sell-side" firm; their customers, the insurance, pension and mutual fund companies etc., are the “Buy-side" firms.

So, the Investment Bank earns commissions as well as makes extra trading profits from dealing for itself, at the brokerage desk. Dealing for itself, with its own money and securities is known as Proprietary Trading. Trades carried out for customers are, on the other hand, referred to as Agency Trades.

Investment Banks also advise on Mergers and Acquisitions and charge a fee for such expertise, helping clients buy other companies. If the seller is not interested then it is even more interesting and profitable for the Investment Bank involved; it gets involved in making the business case and persuading the target to agree to be acquired.

These are some of boutique, specialist Investment Banks. Boutiques are more focused on M&A and other specialist activities; oftentimes with industry specialisation such as aviation, energy, pharma, e-commerce and so on.

Investment Banking is a glamorous business. Those who work in Investment Banking make significant money for their firms and for themselves, whether from M&A or from trading.
Investment Banking (IB) as an activity can be pursued in a separate company;
It can also be pursued as a division of a larger bank as the Investment Banking division.

Today, large banks are present in both Commercial Banking as well as Investment Banking and are often called Universal Banks. In such banks, Investment Banking operates as a division. The principal sources of income in the Investment Banking division of such banks are:

1. Fee from issuance of equity and debt
2. Sale of products to customers of Global Markets and other divisions of the bank
3. Trading profits from buying low and selling high (to meet customer needs)

Main ToC

Customers of the Investment Bank

There are a wide range of entities in the "Buy-side": mutual funds, hedge funds, insurance companies, pension funds, sovereign wealth funds etc.
The "sell-side" usually maintains an aggressive sales force to build these relationships.

The usage of trading desks by other clients of a Universal Bank from Business Banking, Wealth Management and Consumer Banking already provides a good base to work with. Encouraging usage with good advice and creating confidence for line managers in other Lines of Business at a Global Bank helps increase volumes. This is true of the 'Universal Bank' that have multiple lines; not those which are just specialist investment banks.

Across the board, there is a need to maintain a robust and accessible advisory desk. Customers place orders based on the market outlook which they receive and the confidence which the desk creates on trading a position. The quality of advisory services is an important factor in bringing customers to the desk.

Specialist trading is a relatively new driver of growth. Investment Banks provide "Buy-side" firms access to a wider range of markets. Direct Market Access which allows the Buy-side dealers to operate trading terminals are an attractive

Sample names from the Buy-Side

proposition. Other specialist trading platforms enable access to a range of markets: across products and anywhere in the world. Algorithmic trading, programmed trading, high-frequency trading are other developments driven by the blend of technology and markets.

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UNDERSTANDING EQUITY

This topic is also available as a video-book! Click to view.

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What is Equity

When investors invest in the Equity or shares of a business; or company; they become owners of the business. If the company is divided into one hundred parts and each investor owns ONE part, then each investor owns 1% of the company.

Each part of the company is called a “Share”. The share is in that sense, the smallest, indivisible part of a company’s ownership. It is like an atom.

Each owner of a part of the company is called a “Shareholder”. A shareholder may own many parts: if she owns 6 parts, for e.g., she owns 6% of the company. Find out how many shares (parts) a company has; find out how many shares a person owns and you can tell what is the percentage ownership of that person. *‘Shares’, ‘stocks’ and ‘equity’: are all terms that are used interchangeably in normal conversation.*

The Idea of a Business
The Story of Financial Instruments is rooted in the challenges of starting a business. A Business person has a great business idea - But not enough money to pursue the idea.

An investor Is looking for opportunities to invest. The business person explains the idea to the investor. The investor likes the idea: agrees to invest.

Operationally, here is how that Investment process works:

- ☑ The investor gives Money which is called Investing.
- ☑ The business hands over a “Paper” which is evidence of the investment; also known as *Issuance.*
- ☑ The “Paper” contains various promises made by the business person to the investor.

In offering shares to investors, the company does the following:

1. All explanations of the idea are written down
2. All the possible benefits of the investment idea are mentioned
3. All the risks are mentioned
4. AND most important, depending on the kind of investment made, there are promises to either:
    a. Share profits of the business
5. The Rights of the Investor are clearly mentioned.

The business person is the issuer and the investor is the subscriber.

The Benefits of Shareholding

The core promise involved in Equity is that:

1. The owner of the paper becomes an owner of the business.
2. All benefits of ownership flow to the holder of the paper.
3. However, equity limits the problem associated with the failure of a business.

The business owner owns a cow. The cow is the business. He also owns the milk the cow gives.
The milk produced by the cow is the profit of the business. If a cow is owned by a group of people collectively, the produce of the cow is the only way to share ownership, without disposing of, or destroying the business, that is the cow.

Benefits of Ownership

A business makes a profit. Shareholders take some part of the profit as dividend. Shareholders in the company and through the company agree to reinvest the balance of profits in the growth plans of the business.

The profit of future years will increase as a result. The rewards of investing in the future, lie in the future.
Dividends are usually declared annually. Dividends represent the regular rewards of investment.

Businesses can make losses, too.

Shareholders have no obligation beyond the initial capital they invested in the Primary Market. This encourages risk taking as it insulates the owners from business failures and any resultant threat of insolvency.

An investor may have lost the initial amount per share which was invested in the company. But there might be many more people who have to be paid. And our company has no further cash! The shareholders will then say, “Sorry! The loss is limited to the money we originally put in to starting the company.”

This concept of limited loss encourages investors to back enterprise without fear of unlimited loss of personal wealth.

Earnings Per Share

A business is divided into a number of parts each called a share. A business makes a profit. The profit made per share is called: Earnings per Share.

To arrive at this number, take the Profit in a Year divided by Shares in the company.

To take an example:

- Apple’s Earnings Per Share is approx. $ 9.60 per share in 2017.
- Apple made $ 48 billion in profits in 2017.
- Apple has 500 billion shares in 2017.
- Dividing those two numbers we get an EPS $ 9.60.

Dividends

Dividends are determined by a company loosely on the following basis:

- Take this year’s profit (Earnings Per Share)
- Give some to shareholders in cash
- Reinvest some in your future
- Future Earnings Per Share (next year’s profit) will grow as a result
- Dividend is the distribution of (a part or all) profits in cash.
- This is the reward for participating in the risks.

Dividend Policy is about deciding how much to distribute; and how much to reinvest.
Growing / Growth companies give just enough to keep shareholders happy. The rest of the profits are reinvested.

If there are no opportunities to grow, the company will distribute all or most of the profits as dividend.

All investors in a company like for it to have good, strong or high "Earnings Per Share". Some investors prefer high dividend companies: those that payout most of the earnings. Some investors prefer companies with a ***growing*** Earnings Per Share. This implies high reinvestment of profits; or a very high growth trajectory as seen by the likes of Google or Apple Inc.

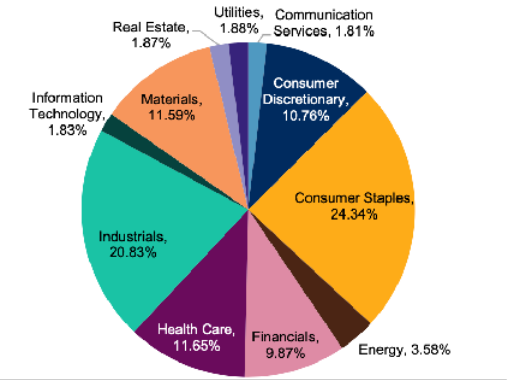
Decisions to Invest

Investors like to find a market price to invest in a share whereby the following ratio is healthy / high: “Return on Investment” or “Yield”.

This can be calculated using any of the following approaches:

1. Earnings Per Share divided by Current Market Price
2. Or by dividing Dividend by the Current Market Price: This is a little tougher: because dividend is a part of Earnings Per Share.

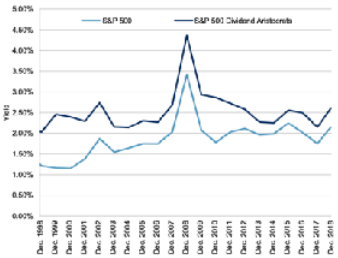
Investment guru Benjamin Graham recommends investing only in those businesses that have a steady or positive trend in dividends over a 10 year period.



Sectors of the top dividend paying companies from the S&P 500

Here are some of the truisms based on these equations:

- ☑ If the Market Price is HIGH, the Yield will be low.
- ☑ If the Market Price is LOW, the Yield will be high.
- ☑ Prices tend to be high when the share is of a high growth company, or a highly valued company.
- ☑ Prices also tend to be high when the market is experiencing a cyclical boom / euphoria phase.
- ☑ Prices tend to be low for stocks might be considered past their growth years.
- ☑ Prices also tend to be low when the market is in a bear phase.



S&P research shows that the average yield of the top dividend paying

Investors do not like companies that *neither* pay out dividends *nor* have growth or new ideas to invest in.

More on Dividends: Finer Aspects

The Procedure for Declaration of Dividends or Bonus is as follows:

The Board of Directors of the company propose a dividend / bonus based on:

- Available Profits
- Accumulated Profits
- Future plans
- Dividend or Bonus is however, approved by shareholders at the annual meeting.
- They could approve something different from what is proposed by management after due discussion and voting

In some cases/ countries there is a concept of Nominal Value or Par Value of a Share. (In some countries the concept of a par value is not popular; the share is just something that has a price and a value.)

Par Value of a Share

Where nominal / par value is considered, these are the underlying concepts:

- "Par" is the "Nominal" value of a share
- This is a number decided when the company is set up
- Dividend is calculated and paid on this value

Examples:

1. Par Value: 10/-
A declared dividend of 25% is 25% on the par value. In this example: 25% of 10 = 2.50 dividend per share.

2. Par Value: 1/-
A dividend of 25% is 25% of the par value.In this example: 25% of 1/- = 0.25 dividend per share.

When a company declares it dividend, if declared as a percentage, it needs to be applied on par or face value. Law requires dividend to also be stated in terms of amount per share.

Instances of 'No Par'

In cases, where there is NO par value (many USA shares for example), dividend is declared in Dollar & Cents per share. (or Pounds and pence, etc.)

Distribution of Profits: Current & Past Profits

Companies usually distribute dividends from current year's profits, though this might not necessarily be so.

Simply put, if the profit of a year are $ 15 million the company will declare a part of this as the dividend for the year: say, $ 5 million.

Let us take an example where the dividend is in excess of the current year's profit. This can happen only if the company has Retained Earnings (i.e. profits of the past); let us assume that number stands at $ 100 million. If dividend declared is at $ 25 m

It implies that $ 10 million is used from past profits in making that dividend distribution.

Therefore, the past profits are drawn down to the extent of $ 10 m and the left over (Closing balance) of Retained Earnings will now be $ 90 million.

Bonus

To understand the issue of bonus shares we need to understand how profits flow through the Financial Statements.

There are two financial statements we will review to understanding this. The profit itself is calculated in the Income Statement, also known as the profit and loss statement. We do not need to look at that. We need to consider the Income Appropriation statement which decides how the profit will be distributed; and the Balance Sheet.

The Servicing of Capital

Shareholders Funds represent the Equity Investment that has to be serviced by the company, by paying out profits. This includes the money originally invested by shareholders in the company plus the accumulated profits of ALL past years. These can be depleted by distribution of dividends or special dividends in later years

The Buildup Of Accumulated Profits And The Issue Of Bonus

When the accumulated profits rise to high levels, shareholders tend to demand greater payouts. A BONUS issue of shares is one way to deal with it. This involves giving free, additional shares to the shareholders. And here is the impact of that act on the financial statements.

When a Bonus is Issued:

- The Accumulated Reserves (also known as Retained Earnings; Shareholders Funds) get transferred to the Capital account.
- The Equity Capital rises to 675 and reserves go to zero, if the entire reserves are given away in bonus.

The Expanded Capital Base Post-Bonus

Going back to the basics we know that this Equity Investment that has to be serviced by the company. So, when considering a Bonus Issue, one of the questions the management of the company considers is whether the future earnings of the company will be sufficient to pay dividends on the larger number of shares!

Impact of Bonus on Number of Shares in a Company

Assume that the number of shares before the Bonus Issue is 1,000.
The Bonus issue announced is: one share for every one already held.

Therefore new shares issued are 1000.

The Total number of shares *after* the Bonus Issue: is 2000

We already know that Earning Per Share is profit in a year divided by the shares in the company. If the profit made by the company is $ 4000 then: the Earnings Per Share before the bonus issue is arrived at by dividing the profit ($ 4000) by the number of shares (1000), and we get $ 4 per share.

Earnings Per Share right after Bonus is 4000 by 2000, which is $ 2 per share.

Some Aspects of a Bonus Issue

If the company has profits, but does not want to distribute cash, it can consider a Bonus Issue. A bonus helps a profitable company retain its liquid cash for deploying into business assets or its business plan.

Since, in a Bonus Issue, everyone gets shares proportionally, all shareholders retain their percentage holding in the company.

Can the company sustain dividends on the enhanced number of shares? After the Bonus Issue, will the Earnings Per Share increase again to pre-bonus levels? Those are questions that the management of the company has to think deeply about before deciding to issue bonus shares.

In the USA, the same effect is obtained by Stock Splits. One can replace the term Bonus Issue with Stock Splits and the preceding discussion remains valid.

The Paradox of Enterprise *(The background to Equity Buybacks)*

Businesses aspire to achieve a cash rich status all their lives. A good number never reach that position.

But a few companies reach a position where the cash generated is significant. The cash generating capacity becomes a huge problem for the company

Here is how that becomes a problem:

If the investment in a business is $ 1 billion and the cash generated by the business is 25% in a year then the free cashflow additionally generated by this company is $ 250 m. This amount is then reinvested in the business, so that the total money into the business is $ 1.25 billion dollars.

If the business continues to generate 25% per annum, the free cashflow generated in the next following is $ 312.5 million.

But a business cannot absorb infinite amounts of cash. Let us say only another $ 250 million can be invested in the business, then the total money in the business is 1.5 billion dollars.

Now the business has started to generate $ 375 million dollars a year.

At some point, the cash generation is so rapid that the company is unable to invest the cash further, because:

A. The business reaches a capacity level at which addition of capacity is not that simple: growing from 50 to 100 is simpler than growing from 500 to 1000

B. A business needs new ideas to put money into; in the old business it may have reached the capacity limit as noted in (a) above.

Excess Cash Goes into Bank Deposits

The business may have to keep the cash it generates in the bank since it has no other place to invest it.

Look at the returns the company now generates.

The $ 1.5 billion dollars generates the business rate of return of 25% so the company generates another $ 375 million. But the bank deposit of 375 million generates return only 6%, yielding 22.5 million dollars.

So the company earns a total of 397.5 million dollars on a total investment of 1875 million dollars. That is only 21.2% compared to what the core business generates at 25%.

The market typically takes a negative view of the decline on returns from 25% in the previous years to 21.2%. In fact, as the years progress, if the company does not find an investment opportunity this return will drop drastically as the cash in bank exceeds the amount invested in the business, progressively.

Problems for the Cash Rich Company

Return on overall assets is dropping from the traditional highs that the market has come to expect from this company.

As the company tries a high dividend payout policy it finds that the cash accretion continues at the old pace and the problem does not go away.

Earnings Per Share stagnates.

Worst of all, the market interprets the inability to invest as the company's lack of vision and plan for the future: "They have no new ideas!"

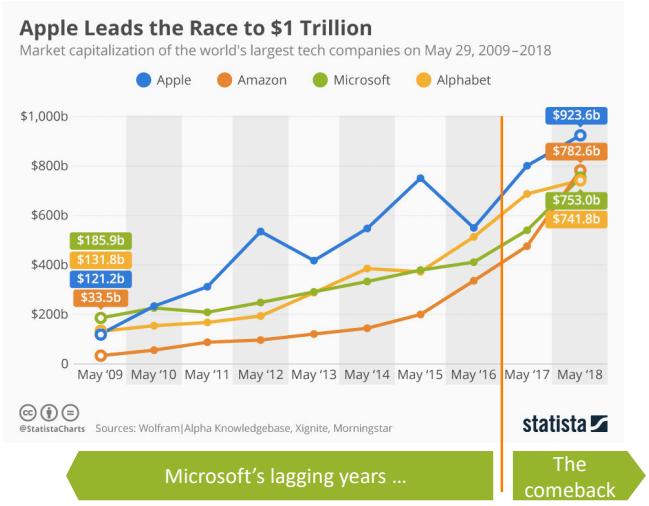
Let us look at the same problem differently.

The sources of funds for the enterprise are the original equity investment and the accumulated profits of the past.

Let us take an example of $ 800 of high yielding assets being deployed in the core business; and $ 700 of cash in the bank which is low yielding. This company has to service $ 1500 of capital. But nearly 50% of its assets are in low yielding assets.

The best real life example of this problem is from Microsoft, valid till about 2015. Microsoft, through its dominance of the operating system market, at one point had $ 52 billion in cash. Windows and Office continued to remain a cash cow. But that is not what the market was looking for.

Even as the company started to pay out more in dividends, the cash inflow did not slow. But MS did not know where to invest this money. As it happens, in the matter of innovation having money is not a solution! MS did not invent Google; nor Facebook; nor Twitter.



With the returns declining and Earnings Per Share stagnating the market took a dim view of MS's ability to innovate. The stock became a hold at 'best'; to some – looking for growth rather than value- it was a clear 'sell'. *(The situation is changed with Microsoft now dominating the enterprise service market).*

Buybacks & Treasury Stock

Buybacks

The Buyback is asSolution to the excess of cash.

In a Buyback, the company decides to buy back its own stock, in effect giving a terminal date to the perpetual nature of a share. We know that the Earning Per Share is arrived at by dividing net profits by the number of shares.

A Buyback *reduces* the denominator in that equation. Profits remaining constant, Earnings Per Share will increase. Earnings Per Share is one of the factors in determining market price of a share as seen in the formula. As Earnings Per Share goes up, the Market Price goes up.

Treasury Stock

If there were originally 60 shares and 20 shares were bought back, these 20 are classified as Treasury Stock now. The remaining shares now, called "Outstanding Shares", are 40.

Therefore, There are various states of Equity Capital as seen below:

- Authorized shares: are The number planned for, when the company was formed.
- Issued Shares: Of the authorized capital, The number issued to raise capital is a part, 60 in this example.
- Treasury Stock: The number bought back is this example is 20
- Outstanding shares are The number held by shareholders; for which the company is answerable to holders; which the company has to service through dividends and various other distribution such as bonus issues, stock splits etc.

Treasury stock is:

- Authorized
- Is considered to be issued because it was once sold (once issued, always issued)
- But is no longer outstanding
- Because it has been bought-back

Consider this example:

Toyota Motor Corp has 35 million shares issued. It buys back 12.5 million. Later, the company needs to expand its capital and issues shares total 5 million. What is the total number of outstanding shares and how much is the Treasury Stock? Does the CFO need to check how much is the authorized capital is, before issuing the shares?

Answer: If the newly issued shares exceed the Buyback you need one check to make sure that the total shares issued are within the initial authorization. *(It can be easily increased, anyway.)*

In this instance, there had been a Buyback of 12.5 m shares; of that only 5 million is being reissued. 7.5 million still remains in Treasury Stock. Therefore there is no need to check Authorized Capital levels.

Rights issues

A Company Might Want To Add Capacity

Let us say that a company plans an Additional factory for $ 300. The company cannot take any more loans, As we assume Its loan taking capacity is full up. The company plans to raise more equity. The company will offer the opportunity to invest to *existing* shareholders as a matter of their *right*. That is called a Rights Issue.

Rights Issues are meaningful when the company has been rewarding shareholders; performing well. Rights are usually offered at a discount to market price to further reward existing shareholders.

Example:

A company has 10 million shares each trading at $ 40. The company is looking to add a factory and decides to issue 2 million new shares for $ 35 each: that is a discount of $ 5 to market price.

This is a 1 share for every 5 held Rights Issue. Mr. X has 5 shares in the company when this announcement is made. What are his options?

Option 1

Buy the one share. For this he has to pay $ 35.
Total shares after rights: 6

Option 2

Sell the "right".
Mr. X will be able to collect no more than $ 5 which is the difference between the market price and the rights price for him as an existing shareholder.

Option3

Allowing the rights to lapse. This would be a mistake considering he is getting it at a discount.

Preferential Issues *(The opposite of Rights)*

In a Rights Issue existing shareholders are given a right to invest additional sums in the company. The right is proportional to the number of shares already held.

By contrast, in a Preferential Issue (also known as a Private Placement), a particular investor is preferred and invited to invest - excluding existing shareholders. Do remember, *all* capital raising, even a Preferential Issue / Private Placement, requires approval of existing shareholders.

Existing shareholders approve of such issues because:

1. They themselves do not have the money to further invest
2. The incoming investor has brand and strategic value which goes beyond just the infusion of cash in to the company.

Warrants

Growing an Enterprise can be viewed as an alternate layering of equity and debt.

Initially a company is funded by the founder promoter. We assume no one will give a new company a loan.

Profits that the company makes are reinvested in the business; such a strategy is true of early, growing years. Now the company is able to raise equal amount of debt.

If we assume that a new project of $ 150, is partly funded by equity to the extent of last years earnings of $ 25 the company might be able to take a loan $ 125.

We skip a few years of profitable and go forward in time. We assume that the company's equity is now $ 200 and it is able to raise fresh loans of $ 200.

As profits are earned and retained, equity goes up. As equity increases, the debt taking capacity increases too.

In this fashion every time the company's equity rises (either through profits or through the raising of additional capital via public issues), its capacity to take on debt increases. The increase in equity plus debt provide capital for new projects, leading to growth.

The Attractiveness Of Warrants

As the company grows through this layering of equity and debt, its share price rises because of the success it enjoys. When the equity share of the company is traded in the market at $ 25, a debt issue could be undertaken. Let us assume that the expected future price of the share is at $ 50. This possibility of appreciation in price can be leveraged in the issuance of debt. As we now know, companies typically layer the issuance and growth of equity with debt.

To this issue of Debt the company could add a warrant. The warrant allows the holder of the debt, to buy into the equity of the company at a discount to *possible* future market price.

If the investor view is that these warrants will be inherently valuable, lenders may be willing to provide debt at *lower* than market rates. if the company executes the project on time, this lower cost of debt will make the company's project particularly successful and profitable.

The warrants may later prove worthless, if the company does not successfully complete its project.

Therefore, a warrant is an instrument attached to another financial instrument that entitles the holder to buy a security at a pre-determined price. Warrants are detachable and traceable separately.

American / Global Depository Receipts ADR / GDR

Market Risk

This is the Risk of loss (in trading/ investment book) arising from exposure to equities.A stock is bought at a particular price. The market price goes down. The risk of making such a loss is market risk.

Unless the investor runs Market Risk – the investor cannot run the possibility of making a gain.
It is this act of BUYING that causes exposure: resulting in Market Risk. Bought or Sold *anything*: Equities, Forex, Interest Rate Products, Commodities: the dynamics are the same. And the definition and impact of market risk is the same .

Liquidity Risk

This is the risk that there are no buyers or sellers in a stock on a given day; so that, even though the stock has value, it is theoretical because it becomes impossible to sell!

Attitude To Risk Of Different Market Participants

All investors who wish to own a company over a longer period of time end up buying equities.
Long term investors closely watch the fundamental performance of the company.

They see value in the cash flow stream that a company generates and the resultant dividend to them.

They also know that over a period of time others too will appreciate the performance of this company: the resultant increase in market prices of the share is to their advantage. The price line shows increase in value over time. This line has to be driven by a consistent/ growing Earnings Per Share in the eyes of the Long Term Investor.

However, long term investors are not one single lump of undistinguishable participants; there are a number of different categories within this group.

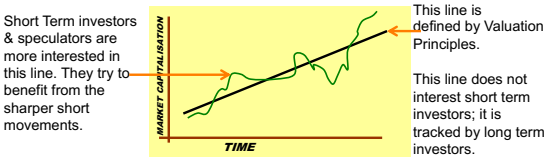
Speculators and Traders

Shorter term investors and speculators also buy and sell shares. While their investment horizon or perspective is fundamentally different from that of the long term investor, these participants are essential to the day-to-day liquidity in the market.

Short term Investors trade in and out to benefit from short term movements in prices.

The price of an equity share is defined by Valuation Principles.

The line representing long term value does not interest short term investors; it is tracked by long term investors.



Short Term investors & speculators are more interested in the volatility in the short term. They try to benefit from the sharper short movements.

Short term investors tend to cause price volatility which sometimes bothers the Long Term Investor and are said to hinder capital attraction.

Equity investments are risky. Companies / businesses may turn out to be different than how they look. They may fail. Even where the company is a great one and the long term outlook of the market is positive, the short term movements can be extremely disturbing.

What happens in secondary trades?

As the shares are traded in the secondary market, it is the owners that keep changing. The change in ownership has nothing to do with the company except that it maintains records of who the new buyer is. Money changes hands between the buyer, or the new owner, and the seller, or the old owner. Which, too, has nothing to do with the company.

So what purpose does the trading of shares serve for the company?

1. Investors know that if a share is traded, they can get their money back through the secondary market whenever they want. This promise of liquidity encourages them to invest.
2. The management of the company gets a signal on how its performance is perceived by the market through share price movements.
3. When the company wishes to raise capital the traded price gives and indication of the price at which it may be able to issue fresh shares.

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UNDERSTANDING FIXED INCOME

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Introduction to Fixed Income

When we look at a business's need for capital, it can be categorised into:

- Long term and
- Short term

Within long term capital sources there are two different types of capital:

- Equity and
- Debt

Equity shares the ownership of the business with the investor.

Debt is synonymous with lending: it is repayable and involves interest, too. They need to be repaid and interest is chargeable on the loan as with any loan.

Debt is available both for the short- and the long-term. The market for shorter term loans is the Money Market. Equity is not available as a short term source.

What are the promises that the Issuer of Debt makes to the Subscriber?

The core promise involved in DEBT is that:

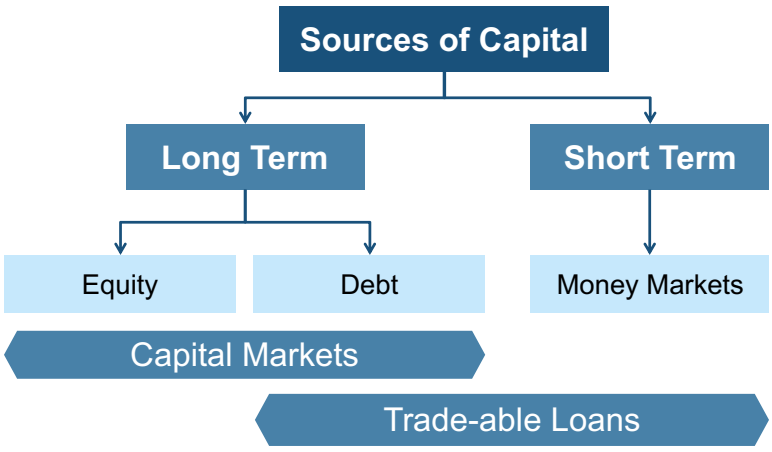
- The owner of the paper will receive repayment of the amount loaned
- Interest will be paid on the loan as per agreed rates and frequency
- The issuer will not do anything that adversely impacts the interests of the lender.

Debt Instruments Are Traded, Too!

The Issuer sells the paper in the Primary Market, and gets the cash needed for the project. Other investors trade in the market as a continuous process.

On the Record Date, the holder of the paper gets:

- Interest, if it is due
- Loan repayment, if due



This chart captures the essence of the Capital & Financial Markets.

The Classification of the Fixed Income Universe

A more accurate description of the universe we are trying to classify would be 'The Trade-able Loan' universe. Let's focus on getting it right for now; the semantics are less important if you really know what you are looking at.

The universe of debt/loan instruments is best understood by classifying it. There are two broad ways to classify the various instruments:

- By maturity
- By 'Issuer'

By Maturity

The life of the instrument is variously termed as: *period, maturity, tenor* – all mean the same.

If the ***tenor*** is short term, the timeline is less than a year; and the categorization of the debt instrument is as **"Money Market Instruments"** (such as; T-Bills, Certificates of Deposit, Commercial Paper).

If the tenor is medium term, the timeline is 1 to 10 years; and the categorization of the debt instrument is as **"Fixed Income Securities"** ; such as (T-note, Corporate Notes).

If the tenor is long term, the timeline is more than 10 years – typically, up to 30 years and the debt instrument is categorized as a **"Bond"**; such as (T-Bonds; Corporate Bonds)

By Issuer

Classifying the debt universe differently: The instruments can also be classified by who the ISSUER is; i.e. who took the loan. The borrower [Issuer] could be:

- Corporate
- Government or
- Others.

Issuer x Maturity

Combining 'Categorization by Borrower' with Categorization by Tenor' we get the following table:

		Who took the loan		
		Corporate	Government	Others
Tenor of Loan	Short Term	Commercial Paper	T-bills	Certificates of Deposit (Issuer: bank)
	Medium Term	Fixed Income Securities	T-Notes	-
	Long Term	Bonds	T-Bonds	Munis etc. (municipalities: USA)

In Conversation

In conversation, when the term 'bond' is used it includes both medium and long term instruments. But it never includes short term instruments which are strictly referred to as 'money market instruments' only.

All government paper (loan instruments) are referred to variously as 'Treasuries', 'Gilts' or 'Government Securities' (G-Secs).

Trading Bonds

In the market place bonds are quoted as follows: the buyer is at 99.10 and the seller is at 99.20. These rates represent percentage of the face value of the bond.

If it is a bond of Face Value $ 1,000
The buy quote is 99.1% of 1000
I.e. Interested in buying at 991

If it is a bond of Face Value $ 1,000
The sell quote is 99.2% of 1000
I.e. Interested in selling at 992

If the Face Value is $ 1m?
Buyer @ $ 991,000
Seller @ $ 992,000

The difference between the Buy and the Sell price is the spread, as it is in all markets!

This price does not include any of the interest aspect of a bond as we shall see. This price is called the 'Clean Price'. We say: "Bonds are traded at the clean price."

Interest (coupons) in bonds

Bonds, as we know, pay interest (coupon) periodically. There are a number of interest payment dates in the life of a bond. Let us take two dates and discuss how far apart they can be.

In corporate issues, interest payment is typically once in 6 months (this is by convention; but it could be quarterly, too. Conventions can be broken.). In Munis interest is paid once in 6 months. Government securities – most governments of the world - pay interest: once in 6 months.

Eurobonds denominated in US dollars pay interest annually, i.e. once in a year.

Swiss and Swedish government bonds pay interest once a year.

It is a matter of convention and practice and those who work in this area either know it from practice; it is also available easily on a Bloomberg or Reuters terminal.

Interest accrual

Time is like a meter, running all the time: the bond earns interest as time ticks, whether payable or not. But what is earned by way of interest is payable only on the contracted 'Payment Date'. To reiterate the point, it is earned continuously.

Assume: interest is earned at $ 1 per day; in 181 days $181 would accrue which will be paid out on the payment date. Then, here is how that would look:

- ☑ On Day One, one dollar is earned.
- ☑ On Day Two another dollar is earned and the total interest due, or accrued is two dollars
- ☑ On the third day another dollar is earned and the total accrued interest is 3 dollars
- ☑ And so on till the day number 181 when the total interest earned, day by day is 181 dollars.

Then comes the next interest payment date and the total accrued interest is paid in cash to the bondholder.

The meter of accrued interest is now reset to zero and from the next day the accrual starts again at one dollar a day.

Accrual and the Traded Bond

When an investor sells a bond it holds, the date could be any date on the calendar: particularly, between any two interest payment dates. Let us mark that as the trade date.

Interest accrued between these two dates belongs to the seller who was the owner of the bond till this day. But the entire interest actually goes to the holder on 'Payment Date # 2', i.e. to the buyer of the bond. So, to remedy the situation, it is agreed in bond markets that the buyer will hand over this accrued amount to the seller along with the purchase price at the time of the purchase. This determines how much is to be paid on the 'Settlement Date'.

The 'Clean Price' plus the 'Interest Accrued' is called the 'Dirty Price'. So, we say: "Bonds are settled at the Dirty Price."

Combining an expression we saw earlier it can be said that, "Bonds are traded at their Clean Price and settled at their Dirty Price."

Here are the steps between trading and settlement:

- Determine the purchase price is also known as clean price
- Determine the last and the next interest payment date
- Determine the Accrued Interest on the Settlement Date
- To the Clean price add accrued interest to get Dirty price
- When the bond is traded, clean price is agreed.
- When the bond trade is paid for (when the trade is settled) the Dirty Price is paid

A Few Points on Clean & Dirty Prices

At any point in time, whether traded or not, the market value of a bond is its dirty price.

Here are the steps involved:

- Find the last quoted price.
- Work out the accrued interest on the date of valuation. Add the two
- That is the fair value of the bond, the cash value it will realise if it is sold immediately.

The market value of a bond is relevant for other transactions, especially where it is used as an asset to be placed as collateral as is the case with a repurchase transaction (repo).

All these are market conventions which need not be explicitly communicated. If due to a lack of understanding on the part of any one counter-party a dispute arises, it will be settled in favour of the party who followed the market convention.

Calls and Puts

Let us look at how

- Call Options Work in a Bond;
- How Puts Options Work; and
- How Convertibility and Call/Put Can Be Combined.

Call and Put Features

The CALL is the bond issuer's right to call back the bond. In other words, it is the issuers decision to repay it early. This must be included in the terms and conditions at the time of issue.

Example: a financial institution issued a bond with the marketing tag line: "make your child a millionaire at the age of 18". It was a deep discount bond offering 18% rate of interest p.a. Subsequently, interest rates came down to 6% p.a. The institution invoked the call option and repaid this high cost borrowing.

The PUT is the bond holder's right to give back or put back the bond. In other words, the holder asks for early repayment. This must be included as in the terms and conditions at the time of issue to apply. Sometimes these are referred as 'embedded options' simply because they need to be pre-included in the terms and conditions at time of issue.

These options are also associated with a 'window' - a time period - during which they can be exercised; and not at any other time. For instance, a bond might specify a fortnight once every 5 years in its 30 year life as the window during which a Call/Put might be exercisable.

The Impact of Embedded Calls

Remember that the price of money is: interest rate. If the interest on the bond is higher than the market rate, the issuer will exercise the call and get the bond back, repaying it. This helps it save interest that it pays, which is right now higher than the market rate of interest. If the interest on the bond is lower than the market rate, the issuer will not exercise the call and continue enjoying the benefit of 'lower than market interest rates'.

There is an exercise window in which the issuer can exercise the call. This comparison of the interest rate on the bond with the market is at that window.

So, the ability to use the call depends on rates, or the outlook on rates, during the window.

Impact of Embedded Puts

If the interest on the bond is lower than the market rate, the holder will exercise the put and give up the bond, asking for money back. This helps reinvest the money in the higher rate available in the market. If, on the other hand, the interest on the bond is higher than the market rate, the holder will not exercise the put and continue enjoying the benefit of 'higher than market interest rates'.

There is an exercise window in which the issuer can exercise the call. This comparison of the interest rate on the bond with the market is at that window.

So, the ability to use the call depends on rates during the window.

Some Combinations of Terms

A call option combined with a conversion clause has the effect of telling the holder: "Either accept conversion to equity; or the bond will be repaid." *(Convertibility of bonds is covered elsewhere.)*

The issuer is able to manage its borrowing costs using such devices. If the bond holder prefers to hold the bond for its higher rates, the issuer is able to force out the investor. This is not suitable to the investor. But at the time of the issue the investor might not have visualized this scenario and preferred to invest.

A put option combined with a conversion clause has the effect of telling the issuer. Either the conversion is attractive; or if it is not, then repay "me". The bond holder is able to manage its earning. If the conversion is not profitable for the holder it will prefer to give back the bond and get its money: invest it anew at higher rates prevailing 'today'.

This is not be suitable to the issuer. But at the time of the issue it might not have visualized this scenario and preferred to raise money on these terms.

Convertibles

A bond normally has a life beyond 10 years. At a point in time, the convertible bond is converted to an equity share. As a bond it pays a coupon. It will be repaid before other forms of securities in event of insolvency. Once it becomes equity it no longer needs to be repaid.

How many shares will the investor get for every bond held? That rate is previously agreed. The conversion may or may not happen, depending on who has the right on the conversion date; and whether investors might be more willing to give loans to a company in its early stages as compared to taking the risk of putting equity into the venture only to see it fail.

Investors that funded the company with debt may be happy to own shares once it is established as a successful company. The company prefers this because it does not have to pay out cash to repay debt in a growth phase.

Look at this example.

It helps us understand a number of terms as also the structure of a convertible.

Size:	US$ 110 million
Term:	7 years
Redemption date:	15 Sep 2010
Nominal value:	US$ 1000
Interest coupon:	3.75%
Conversion price:	US$ 9.3234
Conversion ratio:	107.257
Market price at issue:	100
Bloomberg Ticker	PRTL 3.75 09/10

The data on the left of the a screen is typically what will be available from a data terminal such as Bloomberg or Reuters. The Bloomberg ticker code (ptrl 3.75 09/10) at the bottom when punched into a Bloomberg terminal will call up the issue details. Anyone can check the details without actually accessing any paper.

The nominal value, $ 1,000 is the value on which coupon is payable. Market price at issue indicates the issue price: 100 indicates full value (no discount or premium to nominal value at issue). The coupon at 3.75% when applied on then nominal value gives : dollar value interest payable on the bond.

The conversion ratio is given: each bond converts to 107.2570 shares at anytime before maturity.

It implies a conversion price: bonds worth us$ 1000 will fetch 107.2570 shares which works out to $ 9.3234 per share.

Basic Bond Mathematics

We must now understand simple concepts of :

- Principal, Interest, Tenor and Rate.
- The Oddity of Number of Days in a Year.
- Simple Interest.
- Compound Interest, Compounding & Future Value.

Interest in Financial Markets - Concepts

Interest: is calculated on the principal loan given.

Principal: the amount of the loan on which interest is to be calculated and paid

Interest: A percentage per annum. Always per annum, whether stated so or not. 5% is represented as 0.05. 10% is 0.10. And so on.

Period: The period for which interest is to be calculated. In a full year, the percentage per annum applies.

Actual days: for which interest is to be paid. If the period is less than a year, then we need to work out the interest for the shorter period.

Days in a period and year: When the period is part of a year, interest is payable proportionally. Days in period have to be divided by days in the year.

Days in a year: is always 360 for calculation purposes, in all international, most countries of the world including the USA. Days in a year are 365 only in London and a few select countries.

Bond Market Conventions: the number of days in a period and the number of days in a year follow certain conventions which are not always intuitive. It is important to know the exact method by which those amounts are to be calculated.

Simple Interest

While most people find the concepts of simple and compound interest to be simple and within their zone of familiarity, It is these same concepts that are seen presented differently in bond math. In this section we use the familiar to build the required awareness needed for applying it to bond math.

Simple Interest Implies:

- The amount of interest does not earn any interest on itself.
- The principal earns interest
- The interest itself earns no further interest (whether paid out or not).

Compound interest implies:

- The principal earns interest
- The interest itself earns interest if it is not paid out.
- If earned interest is paid out, then there is no question of paying interest on interest, no question of compounding.

Simple interest is calculated as follows:

Multiply the principal amount of the loan by the rate payable on the proportion of days

Situation: “$ 100 is lent for one year @ 4% per annum. Applying the simple interest formula:
The maturity value is $ 104.

$$P \times (1 + .01)^4$$

Simple Interest & Compound Interest

Situation: “$ 100 is lent for one year @ 4% per annum. Interest is compounded every 6 months.” If 100 dollars is invested, in simple interest the maturity value is 104.

If interest is to be compounded, 100 dollars invested earns 2 dollars in 6 months. From the very next day, the 2 dollars also starts earning interest.

The second half of the year earns interest of another two dollars. The compound interest earns 4 cents. The maturity value in one year is 104.04. The extra 4 cents earned is the effect of compounding.

If compounding was every 3 months:

Situation: "$ 100 is lent for one year @ 4% per annum. Interest is compounded every 3 months."
$ 1 earned till here in 3 months.

From here, 4% p.a for 3 months to be paid On $ 101.
Total interest earned so far $ 1
$ 1.01 earned till here the next set of 3 months.

Total interest earned so far $ 2.01
From here, 4% p.a for 3 months to be paid on $ 102.01.
$ 1.0201 earned till here in the next set of 3 months.
Total interest earned so far $ 3.0301.

From here, 4% p.a for 3 months to be paid on $ 103.0301.
By the last set of 3 months, that is the end of the year $ 1.030301 is earned
Total interest earned so far $ 4.060401.

So $100, @ 4% p.a with quarterly compounding results in maturity value $ 104.060401.
Same amount & rate with 6 monthly compounding results in maturity value $ 104.04.
Same amount and rate, in simple interest results in maturity value $ 104.00.

What Did We Learn?

- ☑ The more often you compound the more the sum builds up to maturity value: $ 104.060401
- ☑ Fewer compounding period gives a smaller sum maturity value: $ 104.04
- ☑ Simple interest gives lowest returns because interest does not earn interest: Maturity value $ 104.00
- ☑ Also: don't be surprised at the large number of decimal places some of the calculations result in.

Note: no rounding off should be done till one is ready to calculate the actual dollar value of the amounts to be paid. That is because what looks like a 6th or 8th decimal place amounts to a good sum for large value transactions.

For e.g. If the maturity value of 104.060401 was applied on $ 100 million, the amount to be paid would be $ 104,060,401. No one in the world of finance would give up $ 401, much less $ 60,401.

Compound Interest From a Formula:

The maturity value can be got by adding the principal to the interest component and is captured in the formula below:

$$\{P \times (1 + r)\}^{t}$$

Compounding periods

The formula for maturity value with compound interest:

If interest is compounded 4 times in a year, take t as equal to 4.

Divide the interest rate in decimals by 4.
If interest rate is 4% p.a. Here is how it will look:

If interest is compounded 2 times in a year, take t as equal to 2.

Divide the interest rate in decimals by 2.
If interest rate is 4% p.a. Here is how it will look:

$$P \times (1 + .02)^2$$

If interest is compounded 12 times in a year, take t as equal to 12.

Divide the interest rate in decimals by 12.
If interest rate is 4% p.a. Here is how it will look:

$$P \times (1 + .0033333)^{12}$$

This is also the formula used for future value.

It answers the same question: what will $ 100 become if invested for a number of years; and if compounded quarterly. Or semi-annually. Or monthly. Or annually.

Present Value and Future Value

Let us learn about:

- Present Value.
- Discounted Cash Flow.
- To Apply DCF in Bond Valuation
- Deep Discount Bonds.
- Value of a Perpetuity.

Present Value

Imagine you can place a deposit with a bank which will pay you 10% interest per annum. In other words, if you invest $ 100 in that bank, it will become $ 110 in one year. If I promise you $ 100 a year from now, it is the same as giving you $ 90.9 today.

You will put it in your bank @ 10% and get 100 a year from now
How did you get that? $ 110 one year from now
Is the same as $100 today

Therefore…
$ 100 one year from now is? (my promise)
The answer involves a simple cross multiplication.

This formula gives the same result, which is a transposition of the future value or compound interest formula.

$$\text{Present Value} = \frac{\text{Future Value}}{(1 + \text{rate})^{\text{time}}}$$

Present Value

What is the present value of $ 100 received a year from now at an interest rate of 10%?
Using the present value formula we get 90.9
This is also known as discounting a future cash flow to its present value.
Or the discounted cash flow analysis

Discounted Cash Flows

Discounted cash flow “brings forward” all cash flows to one common date (usually the present). Money is received at different times in the future: a year from now, two years from now or three years from now how much is it worth today?

To arrive at today's value we have to apply the present value formula, repeatedly, merely changing the number for time ***t.***

Assume, cash received is $ 100 each year and the rate is 10%.

The first year value is 90.9, the second year value is 82.64, the third year value is 75.13, as you can see, as the money arrives later and later, its value is lesser and lesser.

Totaling the three, we get the number 248.67

That is the value of a promise to pay 100 every year for 3 years if the interest rate (discounting rate) is 10%.

A bond is similarly just a series of promises to pay.

What does a bond promise?

A bond represents a loan given. The earning on a loan is the 'interest' / 'coupon' promised to the holder. At the end of the loan period (bond maturity) the loan must be repaid

All of these are future cash flows. We can discount the money receivable each year and value the bond using the formula as shown.

Cashflows associated with a bond are taken as assured. It is of course, dependent on the standing of the promiser. Those issues are not going to be discussed here, but remember this concept of 'assured cashflows' in comparison to cashflows associated with equity.

This is where looking at a deep discount bond helps clarify the mind. A deep discount bond does not pay any coupons. The investor directly gets a sum of money at maturity. There is only one single cashflow to discount. So the value of a deep discount bond is just the discounting of the final year cashflow

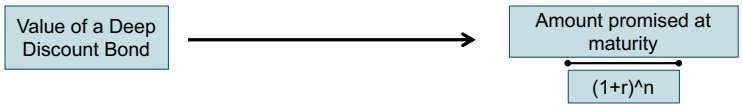
Pricing a deep discount bond

A deep discount bond promises a maturity value. A company wishes to issue bonds that will mature at $ 1,000 in 20 years. Assume that the market rates for such an issuance are at 4% p.a.

Applying discounting we can say that this bond can be issued today at $ 456.3869.

Financing a project with a deep discount bond
To raise $ 456.3869 you need to issue one bond as per the previous step.

- ☑ To raise $ 10 m? You need to issue 21911 bonds.
- ☑ At maturity: the issuer will repay 21,911 bonds x $ 1000 per bond.
- ☑ This maturity value represents the Future Value of $ 10 million borrowed for 20 years @ 4% per annum.



The Value of a Perpetuity

A perpetuity is an amount every month or year, receivable forever. If the amount I am going to receive is the same and I am going to receive it forever, then: the value of the right is the cashflow divided by the rate.

If I have to give you $ 100 forever, every year, I might as well give you a one time payment of $ 1000. You can invest in an investment yielding you 10% per annum. Thereby, you will receive $ 100 for life: which is the amount promised.

All those numbers are assumed but that helps clarify the concept.

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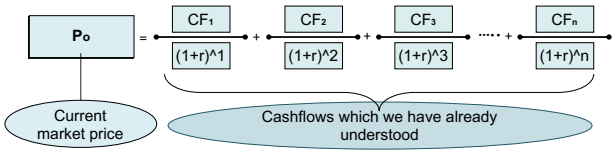
Applying DCF to Bonds

We will now learn the concept of yield to maturity.

Suppose we know the current value of the bond current market price. The traded price of a bond is market information available at data providers like Reuters and Bloomberg. The rest of the cashflows are something which we have already understood.

So far we have been using assumed rates of interest for the discounting (DCF) calculation.

In this exercise we realise that in reality, we know everything else. The only thing we do not know is the value of r.



If Cashflows (1 to n) are known, and the Initial Cash flow is also known, the rate of return this represents can be worked out; this 'r' is called "yield to maturity".

YTM is a percentage return. Data providers also supply YTM on a daily basis; as the price moves, YTM moves. It is one thing to know how these things are calculated. But it is also important to understand the implications of these numbers.

I may buy a bond which is realisable at 1000 at 98. (By now you should the notations and terminology associated with bonds. You should know that $ 1,000 represents Face Value; the 98 represents 98% of the Face Value.)

The $20 gain accrues to me over the period ***from*** purchase of the bond ***to*** the maturity of the bond. This additional 'per annum yield' adds to the 'annual yield' to give us YTM.

YTM is the yield to the holder of the bond if 'Held to Maturity'. It is a factor of the price at which bond is purchased.

YTM varies for different holders of the same bond depending on ***when*** they buy it and the price at which they buy it.

An Intuitive Way to Understand YTM

A bond was purchased for 950/-. It pays a coupon of 80/-.

At maturity, the bond will mature at 1000. The bondholder gains a sum of 50 in addition to the 80 he gets annually. Both benefits added together and annualized comprises the **yield** if the bond is Held to Maturity and is known as YTM. This "50" will be achieved only if the bond is 'Held to Maturity'.

Some Conceptual Exercises

1. Two bonds have identical cashflows. One is purchased from the market at a premium. The other is purchased at a discount. Which will have a higher YTM?

Answer: At maturity, the bond purchased at premium will be redeemed at face value which will cause a loss to the holder. This will pull down the YTM.

The bond bought at a discount will yield a gain on maturity which will increase the YTM.
Since all other cashflows are identical, the bond which results in gain at maturity will have a higher YTM.

2. Two bonds are bought from the market: Bond A at premium; Bond B at discount. Both have the same YTM. Which offers a better cashflow in terms of coupons?

Answer: It says in the given statement that despite causing a loss on maturity, Bond A has the same YTM as Bond B. This means Bond A offers cashflows which are higher than Bond B and these make up for the loss to the buyer of Bond A arising from the payment of a premium at purchase.

3. Two bonds have the same YTM. Bond A has higher cashflow from coupon and Bond B has lesser cashflow from coupons. Which was bought at discount and which was bought at premium?

Answer: Bond A has higher cashflows; but these are offset by losses at maturity. These means Bond A has been bought at a premium.

Market price vs. Intrinsic value

Market price is what a bond trades for; it is the trade / price data seen in the markets and on the terminals or data feeds of data providers.

Intrinsic value is what the bond is worth as seen in the mathematics of bonds and discounted cash flow valuations. Do not be confused by the existence of both of these.

Markets are cyclical. Sometimes, markets overpay: market price is greater than intrinsic value. Sometimes, markets underpay: market price is lesser than intrinsic value.

That is what traders do for a living: try to figure out where market is vis-à-vis value and trade accordingly. This is no different from the play in equity markets.

Coupons and Yields

We now examine:

- Coupons & yields.
- The linkage between market rates of Interest and the price of bonds.
- The price yield relationship

Coupon: things to remember

- This is the ‘interest’ that the issuer of paper promised the subscriber to the paper. It is a rate. This rate is applied on the ‘face value’ of the bond.
- This results in a dollar value of coupon receivable by the holder.
- It has nothing to do with the market price of the paper itself.

Consider a case where the Coupon is fixed at 8% per annum. The dollar value of the coupon is a fixed amount; unaffected by traded price of the bond. Dividing the dollar value of the coupon by the market price of the bond gives us a yield number. The yield referred here is coupon yield: not YTM.

An issuer can change the issue price and change the return an investor actually gets, without changing how much it pays! How much the investor gets is the return an investor earns by buying the bond at this price.

To give an extreme example just to drive clarity:

A bond pays a coupon of $ 80/-.

If the Issuer issues it at $ 800 to the investor, the investor earns a yield of 10% though the coupon is just 8%.

Conversely, if the issuer issues the bond at $ 1,200, the yield to the investor is 6.67% though the coupon remains at 8% or $ 80 paid out by the issuer.

The same example holds if replace issue price with market price paid to purchase a bond.

The example is an extreme simplification and unrealistic but helps you understand the point!

Linkage Between Market Rates of Interest & Bond Prices

Let's say you own a bond on which the coupon is 8% In the market interest rates change to 12%. *(There are various reasons this happens; discussed elsewhere.)* Suddenly what you hold is no longer attractive. You could earn 4% p.a. more if you had invested today, rather than back then when you bought the bond.

You go into the market to sell the bond so you can reinvest in today's market (bonds) at 12%. But who will buy a bond that pays a 8% coupon when the market pays a 12% coupon on new bonds?

(The interest rate differentials are exaggerated for learning. They actually tend to be between 0.1 and 0.75% at most; rarely higher in the developed economies)

The lack of interest in the 8% bond causes its price to drop. To what extent will the price drop?

There are already a lot of things we know about the bond by buying the bond at this price. A bond's coupons and cashflows and maturity value and date are all well known. The price has to drop because of the lack of attractiveness of the bond. The price has to drop to the extent that the buyer should get a yield (return on investment) which is in line with TODAY's market. The holder of the bond who is selling at this price makes a loss.

Let's say you own a bond on which the coupon is 8% . In the market interest rates change to 6%. *(There are various reasons this happens; discussed elsewhere.)* Suddenly what you hold is very attractive. People rush to buy what you hold. The demand for a 8% bond in a market which pays only 6% is huge. To what extent will the price rise?

There are already a lot of things we know about the bond. By buying the bond at a particular price, the buyer should get a yield (return on investment), such that he makes ***no more*** than the rate of return available in the market, which is, in this example 6%. The holder of the bond who is selling at this price makes a gain.

In financial markets, there is no reward for doing what is obvious. Nobody can buy today and make yesterday's return. The trade has to be done in anticipation of a move in order to benefit.

Some Examples

Bond A: coupon is 10% and market price is 800.
Bond B: coupon is 12% and market price is 1200.
Which offers higher yield?

Answer: Where unstated, face value is 1000/-. 10% of 1000 = 100. Yield is 12.5% for Bond A. For Bond B it is 120 / 1200: 10%

Bond A: coupon is 10%. It is quoting at a yield of 8.33%
What market price does that imply?
Answer: 100 divided by 0.0833 = $ 1200 market price

Bond A: coupon is 10%.If you plan to sell the bond at a price higher than par, the yield on the bond will be higher than the coupon or lower?
Answer: Lower.

Bond A: coupon is 10%. If the bond is quoted in the market at below par rates then the yield will be higher or lower?
Answer: Higher.

Summarizing that:

The bond when it is issued, the price is at par.

When Market rates rise, the Bond price falls to a discount; Bond yield rises above coupon.
When Market rates drop, the Bond yield drops below coupon; Bond price rises into premium.

Seniority

We will now discuss:

- The Seniority of Debt.
- The Different Layers in Repayment Priority.
- Look at Preference Shares and Common Shares in the Context.
- How Liquidators Operate

As an idea this becomes relevant only in the event of liquidation.

Seniority lays down the repayment priority. In an insolvency, senior debt is paid first. Subordinated debt is paid after senior, before equity; Equity, common shares, are paid last.

Large corporations can have layers in between, too.

Senior Secured are loans secured by specific property are paid first from the proceeds of that particular property.

Senior Unsecured are loans that have general security and they are paid next.

Amongst Subordinated Debt (those paid out after the Senior) the senior ranked amongst those subordinated are the paid first from subordinated loans.

Junior ranked (or those without the word senior) amongst subordinated loans are paid last.

Preference shares have characteristics of debt, but rank low in the seniority schedule. These are paid before equity shareholders.

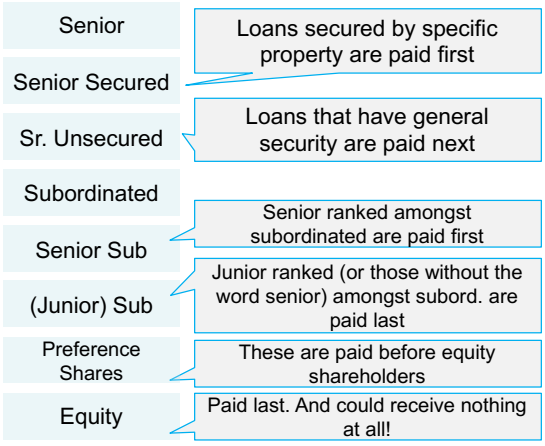
If nothing goes wrong with the enterprise, all bonds will be paid on contracted maturity dates and none of the above will apply. If nothing goes wrong with an enterprise, its equity shares are a perpetuity, never to be paid back - unless a Buyback is initiated!

In an insolvency, the Liquidator (a court-appointed officer of law who understands finance) will sell assets secured towards a particular debt and use it to pay off that loan. All other assets will be sold and converted to cash. The cash will be paid in the order of the liquidation queue described previously, proceeding from senior first, all the way down to equity.

At whichever point the cash runs out, the remaining holders in the queue will receive nothing.

It can happen that the cash pays off one category of debts fully. And only some cash is leftover for the next category. Everyone in that category will receive only proportional share of the money.
For instance: “all subordinated bond holders will receive 25 cents on the dollar.”(Meaning 25% of the amount owed will be received.)

Equity may receive nothing. That is the high-risk, high-reward nature of equity.



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Risks in Fixed Income

Coupon is earned as promised by the issuer. The uncertainty related with this cash flow/ benefit is about the performance about the business and therefore the issuers ability to pay.

If market rates rise higher than coupon; it results in the negative effects of interest rate risk: and the bond holder is at a disadvantage.

There is a possibility of gains in the price of the security. This is market driven and happens if the bond pays higher coupon than range to which the market has moved. Conversely, losses can happen if the bond pays lower coupon than where the market is at.

The bond contains a promise to repay principal. If the borrower (issuer) defaults. There could be a loss of principal. This is credit risk.

Credit risk can also result in gains and losses. This happens if the bond is graded up or down from a previously held rating, which is an increased or decreased perception of credit risk of the issue.

So let us look at all that in a structured fashion.

Interest rate risk
The risk of interest rates changing from what is contracted to a disadvantage.

Reinvestment Risk
The risk to an investor that when the time comes to reinvest, the rates or earning are not as attractive.

Call Risk
The risk that the issuer will call back the bond because its interest rate is high; to the detriment of the holder.

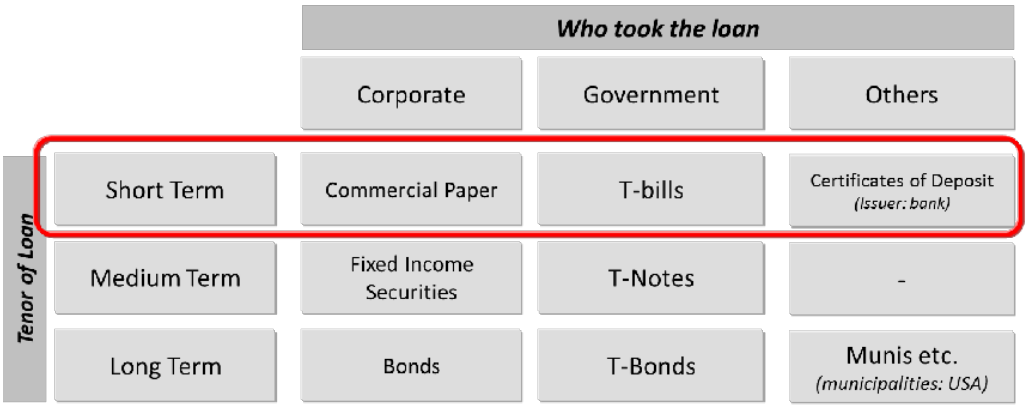
Refunding Risk
The risk to an issuer that when the time comes to take a new loan in the place of the old, the rates are not as attractive; it becomes costlier.

Credit Risk
The risk to an investor that the issuer fails to meet obligations to pay interest, repay principal on time.

Liquidity Risk
The risk from locking up money from long; and for the holder to not be able to get liquidity by trading the bond.

Exchange Risk
It applies if issuer and holders are operating in different currencies. The risk that a change in rates affects the costs / returns adversely.

Money Market Instruments



Money market securities are securities with maturities of up to twelve months, so they are short-term debt obligations. Money market debt is an important segment of the global financial markets, and facilitates the smooth running of the banking industry as well as providing working capital for industrial and commercial corporate institutions. The market allows issuers, who are financial organizations as well as corporates, to raise funds for short-term periods at relatively low interest rates. These issuers include sovereign governments, who issue Treasury bills, corporates issuing commercial paper and banks issuing bills and certificates of deposit. At the same time, investors are attracted to the market because the instruments are highly liquid and carry relatively low credit risk. Investors in the money market include banks, local authorities, corporations, money market investment funds and individuals; however, the money market essentially is a wholesale market and the denominations of individual instruments are relatively large.

Although the money market is traditionally defined as the market for instruments maturing in one year or less, frequently the money market desks of banks trade instruments with maturities of up to two years, both cash and off balance-sheet. In addition to the cash instruments that go to make up the market, the money markets also consist of a wide range of over-the counter off-balance sheet derivative instruments. These instruments are used mainly to establish future borrowing and lending rates, and to hedge or change existing interest rate exposure. This activity is carried out by banks, central banks and corporates. The main derivatives are short-term interest rate futures, forward rate agreements, and short-dated interest rate swaps.

The cash instruments traded in the money market include the following:

A. Treasury Bill (T-Bill): T-bills are non-interest bearing, direct obligations of the United States government. They have an initial maturity of one year or less and are regularly sold at auction (in competitive and non-competitive bidding) by the Federal government. They are sold at discount from their maturity (par, face) value, which ranges from $10,000 to $1 million. The investor's entire return comes in the form of the appreciation in price that occurs as the bill approaches maturity.

B. Negotiable Bank CDs: Negotiable certificates of deposit are money market instruments sold by banks, typically in maturities less than six months. They are issued in denominations ranging from $100,000 to $10 million. The standard round-lot trading unit among dealers is $1 million. These negotiable instruments are traded in the secondary market and are a major tool used by large banks to manage their liquidity.

C. Commercial Paper (CP): Commercial paper is unsecured, short-term, discount securities issued by financial organizations (about 75 percent) and corporations with high credit ratings. CP is a cheap alternative to borrowing from banks or other lending institutions. CP is generally sold in denominations

of $100,000 or more and maturities are limited to 270 days or less, allowing corporations to avoid the registration requirements in the Securities Act of 1933. Typical maturities are around 30 days. Commercial paper can be sold directly to investors or to commercial paper dealers.

D. Eurodollar CDs: Eurodollar CDs are certificates of deposit issued by banks outside the U.S. and denominated in U.S. dollars. (Technically, any certificate of deposit that is denominated in a currency outside the bank of origin can be called a Eurodollar Cd. However, the great majority are in U.S. dollars). They are short-term CDs (less than 12 months maturity) and typically yield a higher interest rate than the domestic CDs of U.S. banks.

E. Repurchase Agreements: “Repos” are transactions in which one party sells securities to another party (usually at a discount from the fair market value) and agrees to buy the securities back at a later date. Repos may be overnight or on a term basis, ranging from a few days to over 30 days, but most are for a term not exceeding two weeks. The securities used in repos are known as “collaterals” and may be Treasury securities, other money market instruments, federal agency securities, or mortgage-backed securities. Repo rates may be lower than the Federal funds rate due to the collateralized nature of the transaction.

F. Bankers’ Acceptances: Bankers’ acceptances are short-term, negotiable securities issued by a bank for a customer, usually to finance export/import financing. The “draft” can be traded in the secondary market and represents an outstanding liability of the issuing bank. They are typically traded at a discount from face value.

G. Federal Funds: Federal funds are reserve balances of insured banks at Federal Reserve Banks that are used to meet reserve requirements. Excess funds are loaned overnight by banks at the “fed funds rate” to other banks with insufficient reserve balances.

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