# ACF 304- Financial Markets

**Week 11**

- Part 1: Function of the financial markets

Channels funds from person to person or business without investment opportunities (ex: lender-savers) to one who has them (borrowers-spenders), improving economic efficiency.

Lender-savers: Households, business firms, government, foreigners.

Borrower-spenders: Business firms, governments, households, foreigners.

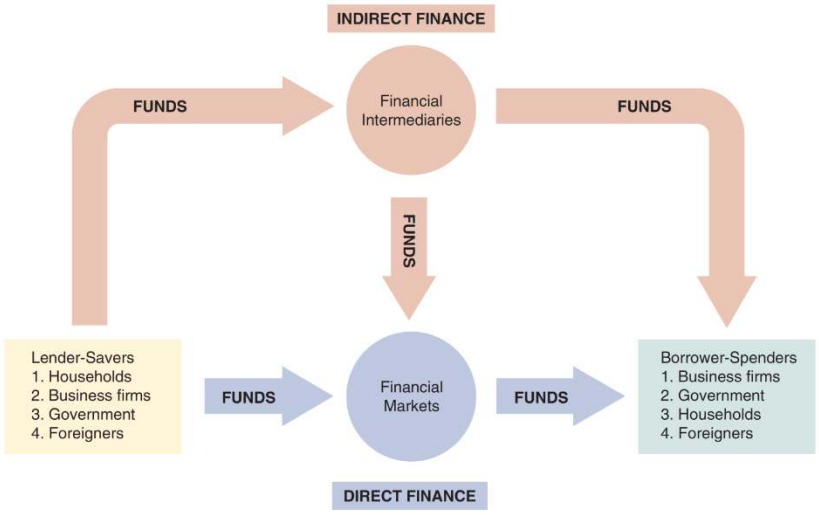
News - The coronavirus pandemic will push the national debt past the previous world war ii peak

Segments of financial markets ->

1) Direct markets: Borrowers borrow directly from lenders in financial markets by selling financial instruments (securities) which are claims on the borrowers' future income or assets.
2) Indirect markets: borrowers borrow indirectly from lenders via financial intermediaries (established to source both loanable funds and loan opportunities)

(securities are assets for the person who buys them, but they are liabilities (IOUs or debts) for the firm or government that sells them

Flow of funds through the financial system




Importance of financial markets: If there wasn't financial markets there would not be an opportunity to earn returns on savings. Financial markets are critical for producing efficient allocation of capital, allowing funds to move from people who lack productive investment opportunities to people who have them.

- Part 2: Structure of the financial markets

It helps to define financial markets along a variety of dimensions (not necessary mutually exclusive).

1) Debt markets: Short term (<1 year); long term (>10 years), intermediate term (maturity in between)

- Represents a loan to the company/government
- Bond/loan has an interest payment associated
- $39.7 trillion bonds outstanding today (US).

2) Equity markets: pay dividends, ownership of the firm total value of the US equity is about 30 trillion $
3) (desventajas de cada una que ya se me desde primero; si la empresa entra en quiebra un accionista no recibe nada, pero a cambio puede votar y recibir dividendos…)

Structure of the financial markets:

1) Primary market: new issues sold to initial buyers, typically involves an investment bank who underwrites the offering.
2) Secondary market: securities previously issued are bought and sold, NYSE, NASDAQ…involves traders and market-makers

Firms don't get any money from the secondary market, but it has some key functions:

- Provides liquidity, making it easy to buy and sell the securities of the companies
- Establishes a price for the securities (useful for company valuation)
- Provides useful security financial information
- Provides useful customer information
- An investment bank will not win a lucrative *Primary* market mandate *e.g.US equity IPO* unless it has a strong *Secondary* market presence

*FT Read - "Advisers rack up $1.1bn in fees for LSE-Refinitiv deal"*

We can further classify the financial markets into the following:

1) Exchanges: trades conducted in central locations (New York stock exchange)
2) Over the counter markets (OTC): Dealers at different locations buy and sell. Best example is the market for US treasury securities.

We can also classify markets by the maturity of the securities:

1) Money market: short-term ( maturity <1) year
2) Capital market: Intermediate & long-term debt: Intermediate (1-10 years), long term (>10 years) plus equities (no maturity).

The buy side vs the sell side… a financial markets institutional classification

- Buy side: asset managers, pension funds, insurance companies, hedge funds, private wealth managers.
- Sell side: Investment bankers, (interdealer brokers).

Classification of the financial markets:

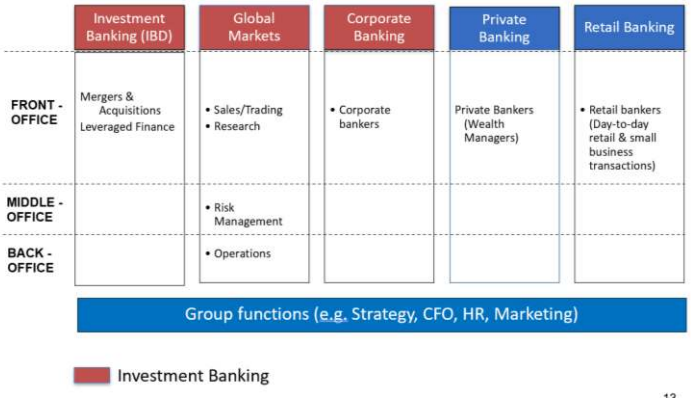
DIRECTLY INVOLVED IN FINANCIAL MARKETS

- Investment Banking – SELL SIDE
- Interdealer Brokers – SELL SIDE

- Asset Management – BUY SIDE
- Private Wealth Management – BUY SIDE
- Hedge Funds – BUY SIDE
- Insurance Companies – BUY SIDE
- Pension Companies – BUY SIDE

INDIRECTLY INVOLVED
- Private Equity
- Financial Consultancy
- Actuaries
- Ratings Agencies
- Vendors
- Retail & Commercial Banking

*Different sectors in Banking*

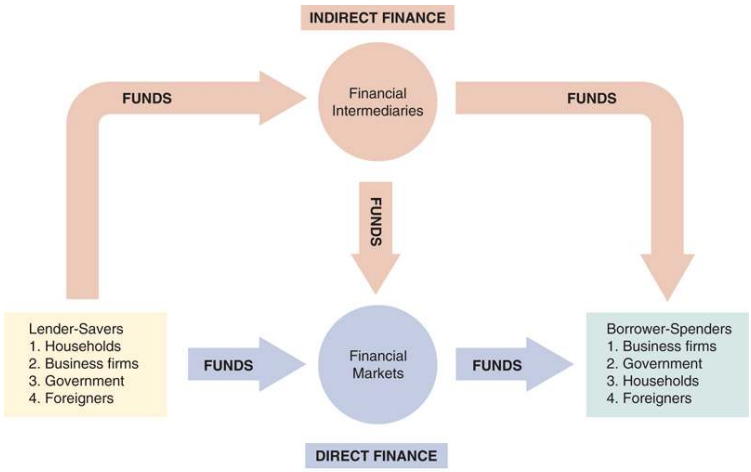



Investment Banks…Sell Side ? Yes but…

*Investment Banks are trying to grow their Asset Management business.*

- Asset Management requires comparatively little capital to operate.
- …and generates consistent fee income.
- Investment Bank Global Markets / Trading is a profit volatile business.
- …requires lots of capital.
- In Retail Banking – profits are low in a low interest environment.

- Part 3: Function of financial intermediaries




The arrows show that funds flow from lender-savers to borrower-spenders via two routes: *direct finance*, in which borrowers borrow funds directly from financial markets by selling securities, and *indirect finance*, in which a financial intermediary borrows funds from lender-savers and then uses these funds to make loans to borrower-spenders.

- Indirect finance: instead of savers lending money directly to borrowers, a financial intermediary, such as bank, plays as a middleman. This process (intermediation) is the primary means of moving funds from lenders to borrowers, needed because of transaction costs (taking advantage of economies of scale, which means that they provide its customers with liquidity services, making it easier to conduct transactions), risk sharing (FIs create and sell assets with lesser risk to one party in order to buy assets with greater risk from another party) … (more important source of finance than securities markets i.e. stocks). Another reason FI exists is to reduce the risk of asymmetric information (One party lacks crucial information about another party, impacting decision making. (a borrower who takes out a loan usually has better information about the potential returns and risk associated with the investment process than the lender does. ) There are two fronts to discuss the problem: adverse selection and moral hazard:

  - Adverse Selection
    1. Before transaction occurs
    2. Potential borrowers most likely to produce adverse outcome are ones most likely to seek a loan..
    3. Similar problems occur with insurance where unhealthy people want their known medical problems covered

  - Moral Hazard
    1. After transaction occurs
    2. Hazard that borrower has incentives to engage in undesirable (immoral) activities making it more likely that won't pay loan back..
    3. Again, with insurance, people may engage in risky activities only after being insured

  Financial intermediaries reduce the risk of adverse selection and moral hazard, enabling lenders to make profits.
- The importance of financial intermediaries relative to securities markets: firms usually obtain funds through financial intermediaries, not from capital markets. However, the use of bonds vs intermediate finance varies from country to country.

- Part 4- Internationalisation of financial markets

The us does not longer dominate the world stage.

- Foreign bonds: Denominated in a country's currency ( New Zealand issuing a GBP bond in UK regulated bond market
- Eurobonds (Bigger): Denominated in a currency other than that of the country in which is sold ( Walt Disney $ bond in Europe). Eurobond market is currently bigger than US market. Over 80% of new bonds are Eurobonds.

- Eurocurrency Market (FX not bonds!): Foreign currency deposited outside of the home country (Eurodollars are USD deposited in London, which gives US borrowers an alternative source for dollars)
- World stock markets: US stock markets are no longer the largest (at one point Japan was larger)
- The 3 main us stock Exchanges: Dow Jones industrial average, Standard & Poors 500, NASDAQ

> FOLLOWING THE FINANCIAL NEWS

| Foreign Stock Market Indexes | |
|---|---|
| Foreign stock market indexes are published daily in newspapers and Internet sites such as https://www.ft.com/ https://www.bloomberg.com The most important of these stock market indices are: **Dow Jones Industrial Average (DJIA)** An index of the 30 largest publicly traded corporations in the United States maintained by the Dow Jones Corporation. **S&P 500** An index of 500 of the largest companies traded in the United States maintained by Standard & Poor's. **Nasdaq Composite** An index for all the stocks that trade on the Nasdaq stock market, where most of the technology stocks in the United States are traded. | **FTSE 100** An index of the 100 most highly capitalized UK companies listed on the London Stock Exchange. **DAX** An index of the 30 largest German companies trading on the Frankfurt Stock Exchange. **CAC 40** An index of the largest 40 French companies traded on Euronext Paris. **Hang Seng** An index of the largest companies traded on the Hong Kong stock markets. **Nikkei 225** measures the performance of 225 large, publicly owned companies in Japan from a wide array of industry sectors. |

| | Last | Today's change |
|---|---|---|
| S&P 500 | 3,852.97 | +28.83 +0.75% |
| Dow | 33,269.77 | +133.40 +0.40% |
| FT Wilshire 5000 Index | 39,055.34 | 0.00 0.00% |
| Nikkei | 25,820.80 | +103.94 +0.40% |
| Hang Seng | 21,052.17 | +259.06 +1.25% |
| DAX | 14,474.88 | -15.90 -0.11% |
| FTSE 100 | 7,617.24 | +32.05 +0.42% |

Bonds & rates >

| Country | 2-year yield | 10-year yield |
|---|---|---|
| Europe | 2.62% | 2.30% |
| Japan | 0.03% | 0.43% |
| United Kingdom | 3.46% | 3.52% |
| United States | 4.40% | 3.71% |

- Global perspective: Relative decline of the US capital markets.

  U.S has lost its dominance in many industries: automobiles and consumer electronics…

  New markets have appeared, like London and Hong Kong, where many companies want to be listed.

  However, U.S has benefitted from the largest companies on the world (Amazon, apple, Microsoft…), while the Brexit has affected London market and fails to attract new companies listings.

  Why? 1) New technologies in foreign stock markets 2) 9-11 made regulations tighter 3) greater risks of lawsuits in the US 4) Sarbanes-Oxley has increased the cost of being a U.S.-listed public company

- Part 5: summary

- Function of Financial Markets: We examined the flow of funds through the financial system and the role of intermediaries in this process.
- Structure of Financial Markets: We examined market structure from several perspectives, including types of instruments, time horizon, Primary and Secondary markets, OTC versus Exchange traded and types of organisation.
- We also looked at the Buy Side /Sell Side organisational distinction and the structure of Banking including Investment Banking.
- Internationalisation of Financial Markets: We briefly examined how debt and equity markets have expanded in the international setting.
- Function of Financial Intermediaries: We examined the roles of intermediaries in reducing transaction costs, sharing risk, and reducing information problems.

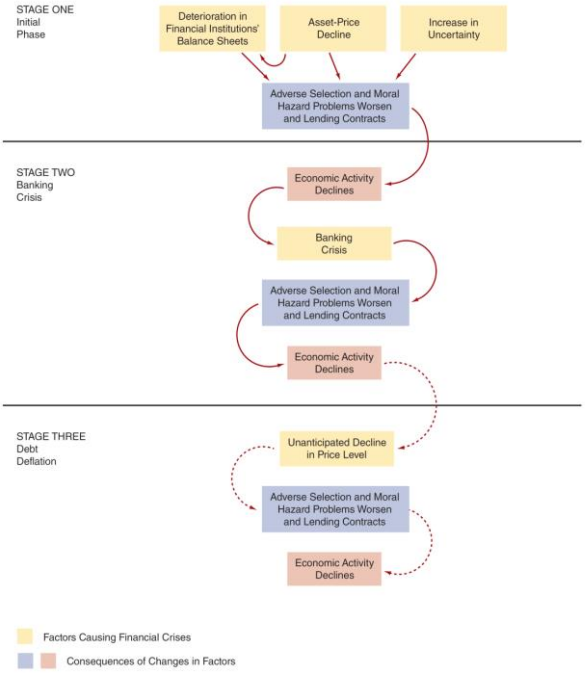
**Week 12**

- Part 1: Theory of financial crisis

Financial crisis are major disruptions in financial markets characterised by sharp declines in asset prices and firm failures. Beginning in august 2007, the U.S entered into a crisis that was described as “once in a century credit tsunami”.

Adverse selection and moral hazard (topic 1) are the basis for understanding and defining a financial crisis. Asymmetric information creates barriers between savers and firms with productive investment opportunities. A financial crisis occurs when information flows in financial markets experience a particularly large disruption. Financial markets may stop functioning completely.

Dynamics of financial crises in advanced economies: each event (crisis) helps economists gain insights into that crisis and present-day turmoil (state of confusion). Financial crises have always been with us. Financial crisis hit countries on average every 20-30 years, produced in three stages:



- Stage 1 initial phase: Financial crisis begin in several ways: Credit boom and bust, Asset-Price Boom and Bust, Increase in Uncertainty. Seeds of a financial crisis begin with mismanagement of financial liberalisation or innovation:
    - Elimination of restrictions (Trump and Dodd Frank)
    - Introduction to new types of loans or other financial products (Mortgage-backed securities, CDS)
    - Either can lead to a credit boom, where risk management is lacking
    - Government safety nets weaken incentives for risk management. Depositors ignore bank risk-taking (the Greenspan put)
    - Eventually, loan losses accrue, and asset values fall, leading to a reduction in capital.
    - Financial institutions cut back on lending, a process called "deleveraging". Banking funding falls as well.
    - As Financial intermediaries cut back on lending, no one is left to evaluate firms. The system losses its primary institutional function to address adverse selection and moral hazard. Economic hazards contracts as loans become scarce.

  A financial crisis can also begin with an asset-price boom bust:

    - A pricing bubble starts, where asset values exceed their fundamental values.
    - When the bubble bursts and prices fall, corporate worth falls as well. Moral hazards increase as firms have little to lose.
    - Financial intermediaries see a fall in their assets, leading again in deleveraging.

  Finally, a financial crisis can begin with an increase in uncertainty:

  - Periods of high uncertainty can lead to crises, such as stock market crashes or the failure of a major financial institution. Examples include:
      - 1857, when the Ohio Life Insurance & Trust Company failed
      - 2008, when AIG* (*CDS exposure), Bear Sterns, and Lehman Bros. failed
  - With information hard to come by, moral hazard and adverse selection problems increase, reducing lending and economic activity.

- Stage 2 banking crisis:

  Deteriorating balance sheets lead financial institutions into insolvency. If severe enough, these factors can lead to a bank panic.

    - Panic occurs when depositors are unsure which banks are insolvent, causing all depositors to withdraw funds immediately.
    - As cash balances fall, Financial institutions must sell assets quickly, further deteriorating their balance sheet.
    - Adverse selection and moral hazard become severe (it takes years for a full recovery).
- Stage 3 Debt deflation:
    - Consider a firm in 2015 with assets of 100 million, 90 million of long term liabilities, and so 10 million in net worth
    - Price levels fall by 10% in 2016.
    - 2016 assets (shares, properties…) value falls to 90 million.
    - 2016 liabilities (bonds it has issued) remains the same 90 million.
    - The firms net worth falls to zero.

- What happens if prices fall 12%?
- This is why Central banks target 2% not zero inflation!

- Part 2: the Great Depression

In 1928 and 1929, stock prices doubled in the US. The Fed tried to curb this period of excessive speculation with a tight monetary policy (Reduce "buying on margin"). But this led to a stock market collapse of more than 20% in October of 1929 and losing an additional 20% by the end of 1929. The declined continued for several years.

What might have been a normal recession turned into something far worse, with severe droughts in 1930, which led to a sharp decline in agricultural production.

Between 1930 and 1933 one-third of US Banks went out of business as these agricultural stocks led to bank failures. For more than two years, the Fed sat aimlessly by through one bank panic after another.

Adverse selection and moral hazard in credit markets became severe. Firms with productive uses of funds were unable to get financing. Credit spreads increased from 2% to nearly 8% during the height of the depression of 1932.

The deflation during the period lead to a 25% decline in price levels. The prolonged concentration led to an unemployment rate around 25%.

The depression was the worst financial crisis ever in the US. It explains why the economic contraction was also the most severe experienced by the nation.

Bank panics in the US spread to the rest of the world and the contraction of the US economy increased the demand for foreign goods. The great depression caused great hardship, and the resulting discontent led to the rise of fascism and WWII.

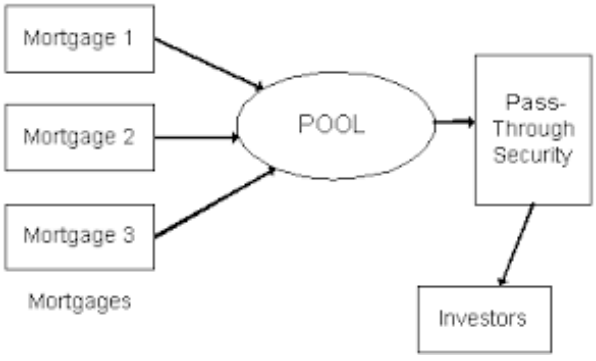
- Part 3: Mortgage-backed securities.

To understand the 2008 crisis we need to first understand what mortgage-backed securities are.

Mortgage loan: loan secured by the collateral (real estate property). Payments: interest, scheduled principal payment, prepayments (payments in excess of the required monthly mortgage payment; ex: early sale of a property, natural disaster followed by insurance payment, refinancing when interests go down)

Different types of mortgages: traditional fixed rate, flexible rate, interest only, partial amortizing (fixed or floating)

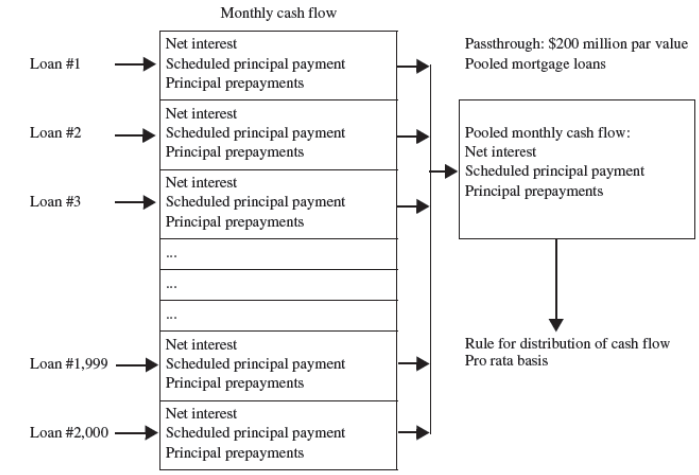
However, mortgages can be sold to investors (traditionally a safe investment)



**Mortgage Pass-through securities**

- Holders of the mortgages form a pool of mortgages and sells shares or participation certificates in the pool
- Monthly mortgage payments are passed through to the (bond) certificate holders on a pro rata basis
- When mortgages in the pool are collateralized, the mortgage pool is considered to be securitized
- The exact cash flow amount received by the bond investor is uncertain: depends on the cash flow of the borrowers/mortgage holders in the pool (principal and interest less any servicing fees)
- Looking at 1 individual mortgage the prepayment risk is potentiall high.Looking at a pool of 2000 mortgages prepayment risk is reduced.

EXHIBIT 7 Creation of a Passthrough Security



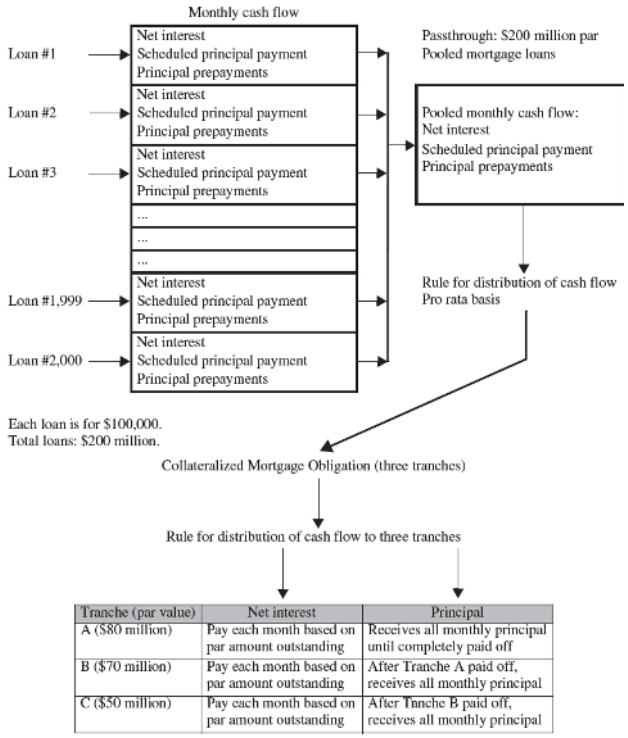

Mortgage pass-through securities vs "normal" coupon bonds:

## Mortgage Pass-through Securities versus a 'Normal' Coupon Bonds

| | Mortgage Pass-through | Coupon bonds |
|---|---|---|
| Principal payments prior to maturity | Yes | No |
| Payments | Monthly | Annual /Semi-annual |
| Payment uncertainty | Higher (prepayments) | No |

- Collateralized Mortage Obligations
  - There are rules for the payment of interest and principal (scheduled and prepaid) to the bond classes (tranches) in the CMO
  - The purpose of the CMO is to redistribute prepayment risk to **different tranches**

EXHIBIT 8 Creation of a Collateralized Mortgage Obligation




| Tranche (par value) | Net interest | Principal |
|---|---|---|
| A ($80 million) | Pay each month based on par amount outstanding | Receives all monthly principal until completely paid off |
| B ($70 million) | Pay each month based on par amount outstanding | After Tranche A paid off, receives all monthly principal |
| C ($50 million) | Pay each month based on par amount outstanding | After Tranche B paid off, receives all monthly principal |

**Collateralized Debt Obligations (CDOs)**

Significant growth in recent years until the subprime mortgage crisis.

Similar to collateralized mortgage obligation (CMO), except that the assets pledged as collateral are Credit cards, Domestic and foreign bonds, bank loans, distressed debt, Foreign bank loans, asset-backed securities, commercial and residential mortgage-backed securities.

*CDOs are packaged to provide unique income streams and risk levels (tranches)*

Collateralized Debt Obligations (CDOs) role in the crisis.

- A *special purpose vehicle* (SPV) is created to buy assets, create securities from those assets, and then sell those securities to investors.
- In a CDO, the securities (or tranches) are created based on default priorities. The first defaults go to the lowest rated tranches. The highest rated tranches only suffer defaults if most of the asset's default.

There are many, many **tranches** in a CDO, each with different exposure to defaults:

- The highest rated tranches are called ***super senior*** tranches.
- The next bucket is known as the ***senior*** tranche – it has a little more risk and pays a higher interest rate.
- The next tranche is the ***mezzanine*** tranche - it bears more risk and has an even higher interest.
- The lowest tranche is the ***equity*** tranche - this is the first tranche that suffers losses from defaults.

Bottom line - increased complexity of structured products can actually reduce the amount of information in financial markets. Makes you wonder who is willing to buy these in the first place!

- Part 4: 2008 financial crisis

We begin by examining three central factors:

1) Financial innovation in mortgage markets:
    a. Less-than-credit worthy borrowers found they could get sub-prime mortgages
    b. New financial products (MBS & CDOs) to further enhance and distribute risk to investors from mortgage lending
2) Agency problems in mortgage markets also reached new levels:
    a. Mortgage originators sold them in the secondary market
    b. Mortgage originators earned fees from the volume of mortgages produced, not the quality
    c. In short, unqualified borrowers bought houses they weren't able to purchase through creative mortgages or outright fraud (inflated income)
3) Credit rating agencies did not help (asymmetric information from credit agencies)
    a. Agencies consulted with firms on structuring products to achieve highest rating, creating a conflict of interest
    b. The rating system was hardly designed to address the complex nature of the structured debt designs.
    c. The result was meaningless ratings that investors had relied on to assess the quality of their investments.

Five main areas that suffered the crisis: US Residential housing, FIs balance sheets, The "shadow" banking system, Global financial markets, The failure of major financial aims.
The housing boom was lauded by economists and politicians, which helped stimulate growth on the sub prime market as well.
Lending standards also allowed for nearly 100% financing, so owners had little to lose when the bubble burst.
What Fed blames the housing bubble on? Some argue Low interest rates from 2003 to 2006. Mr Bernanke said the rates were appropriate. He said that probably the new mortgage products and the relaxed lending standards were likely causes. Bernanke's speech was very controversial, and the debate over whether monetary policy was to blame for the housing price bubble continues to this day.

As mortgage defaults rose, banks saw the value of their assets fall. This was complicated by the complexity of mortgages, CDOs, default swaps, and other difficult to value assets. Banks began the deleveraging process, selling assets and restricting credit, depressing the struggled economy.

The **shadow banking system** also experienced a run. These are the hedge funds, investment banks, and other liquidity providers in our financial system. When the short-term debt markets seized, so did the availability of credit to this system. This led to further "fire" sales of assets to meet higher credit standards.

The fall in the stock market and the rise in credit spreads further weakened both firms and households balance sheets. Both consumption and real investment fell, causing a sharp contraction in the economy.

Europe was actually first to raise the alarm in the crisis. With the downgrade of $10 billion in mortgage related products, short term money markets froze, and in August 2007, a French

investment house suspended redemption of some of its money market funds. Banks and firms began to horde cash.

The end of credit led to several bank failures. Europe experienced a more severe downturn than the U.S.

Finally, the collapse of several high-profile investment firms deteriorated confidence in the US. Bear stern sold to JP Morgan for 5% of the value one year ago, Freddie Mac and Fannie Mae put in conservatorship. Lehman brothers fell for bankruptcy. Merrill Lynch sold to Bank of America. AIG liquidity crisis

The crisis and impaired credit markets caused the worst economic contraction since World War II.

- The crisis peaked in September of 2008.
- Congress passed a bailout package, but the stock market continued to decline, and credit spreads reached over 500 bps.
- The fall in real GDP and increase in unemployment to over 10% in 2009 impacted almost everyone.
- The recession that started in December 2007 became the worst economic contraction in the United States since World War II, and is now called the "Great Recession."

- Part 5: The European sovereign debt crisis

Up until 2007 all the countries that had adopted the euro found their interest rates in very low levels. At the same time, several of these countries were hit very hard: lower tax revenue from economic contraction, high outlays for FI bailouts, fear of gov default cause rates to surge.

Greece was the first to fall. Gov predicted a 6% deficit and 100% debt to GDP. In October, with new government officials. Fear of default caused rates on Greek debt to peak at 40%. Debt to GDP rose to 160% in 2012. Greece was forced to write-down its debt (partial default). Civil unrest broke as unemployment rates climbed. Prime minister was forced to resign.

Ireland, Portugal, Spain, and Italy followed

- Governments forced to embrace austerity measures to shore up their public finances.
- Interest rates climbed to double-digit levels.
- Severe recessions resulted, despite assurances from the ECB to help.
- Unemployment rates rose to double digits (25% in Spain).

**Week 13:**

- Part 1: Covid-19 financial crisis

It was not an asset bubble crisis but the theory of financial crisis still applies to a point. There was no stage 2 banking crisis, as the central banks learnt their lessons through the 1929 crisis. There was a huge injection of financial support (a combination of monetary and fiscal policies)

Monetary policy: the problem was interest rates were only 1.5%-1.7% to start with (while the average "Fed Funds" rate over the last 40 years is 5.95%. The Fed had been trying to "normalise"

interest rates over the last few years just for that reason. With monetary policy unsuccessful, fiscal intervention was required.

| Year | Debt / GDP |
|---|---|
| 2007 | 61% |
| 2013 | 99% |
| 2020 (Q2) | 127% |

April 2020: Global demand is down about one third, oil prices dropped to 20$ p.b, first time in 18 years. A severe drop in demand coinciding with levels of US production remaining robust despite storage tanks being just weeks away from reaching capacity. US oil for immediate delivery fell to -40$ per barrel (which means that producers were paying you to take oil from them, as they didn't have capacity to store them). Nowadays a barrel is 80$.

Gold didn't behave as a typical safe-haven asset.

Stocks a lot higher than their lows (investors buying the dip)

Summary:

-US stock markets reached all-time highs 2021 supported by
a) massive central bank support
b) strong technology company performance
- Global stocks followed in 2021
- Bond yields now a lot higher Jan 2023 (remember inflation now the issue)
- Gold back near $2,000 per ounce (Jan 2023)
- Oil price has rebounded and now near $80 per barrell (Jan 2023) and traded a lot higher in 2022

- Part 2: Regulatory response to financial crisis.

Crises lead to two things: a strengthening of financial institutions internal controls (risk management); and Financial regulation

- Securities act of 1933: enacted by congress in 1934 during the great depression and the crash of 1929. It was the first major federal legislation to regulate the offer and sale of securities. The act took power away from the states and gave it to the federal government. Also created a uniform set of rules to protect investors against fraud.
- Dodd–Frank Wall Street Reform and Consumer Protection Act (US) (in response to 2008 crisis): Comprehensive regulation of financial markets, including increased transparency of derivatives; Volker rule: Prohibits banks from proprietary trading. Restricted activities and profitability of investment banks. In 2018 Donald trump signed a law easing financial regulations for banks bellow 250 billion in assets. Donald trump targeted de regulation by reducing capital ratios, revisiting measures banning risky trading, reduced consumer protection. US banks shares outperformed.
- Basle 3: Goal: to steer the financial industry, especially banks, away from the practices that led to the 2008 crisis, which meant higher capital requirements. Financial institutions must save aside capital against risky activities (like a 30 year loan or owning a 30 year corporate bond).

- If the capital requirement for an IB holding a 30-year corporate bond is 3% for every 100MM bonds, it owns it must set aside 3MM in capital
- If capital ratios are raised to 6% for every100MM bonds it owns it must set aside 6MM in capital
- Therefore, raising capital ratios restricts the ability of a financial institution/investment bank to do business!
- The accord aims to prevent banks from hurting the economy by taking more risks than they can handle.

This can lead to a market liquidity problem which is exactly the problem today in Corporate Fixed Income Trading

- Mifid2: EU + UK
  - Price transparency: Making prices of securities (esp FX, Bonds & Derivatives) more visible to clients 'pre' and 'post' trade.
    - Pre-trade transparency - trading venues and market-makers to publish offered, executable quotes before a trade is complete
    - Post-trade transparency - all trades must be immediately included in a trade report. Such trade report, containing the volume and price must be published to the market. Post-trade transparency requires the timely publication of trade data to an Approved Publication Arrangement (APA).
  - Research unbundling: The sell side can no longer provide research to the buy side for free (Before, the buy side used to pay the sell side in trade flow) (i.e *For Deutsche Bk research, Buy Side executes multiple equity Sell orders with DB traders e.g. Fidelity AM sells 200,000 BP shares at 100 pence per share)* *No entiendo!*
  - *Who pays for the research – the Fund Manager or the Fund Manager's clients???*
    - Buy Side e.g. Blackrock must deal at the best price in the market and show 'Best Execution'
    - If a Fund Manager was receiving research from 50 Investment Banks for 'free' pre MIFID2…now that might be 5-15 banks
    - Fund Managers now do more of their own research *(Research career prospects better on Buy Side?)*

- Part 3: Structure of the FI Market & Corporate bond liquidity problem

Market participants:

- Buy side: Institutional asset managers (Blackrock), Hedge funds, Wealth managers, smaller EMEA Banks
- Sell side: tier 1: Investment banks (Morgan stanley), tier 2: banks (Lloyds); sell side brokers.

Fixed Income asset classes:

- Government bonds: US Treasuries, UK guilts – rates.
- Sovereigns: issued by Sweden, Italy to international clients outside the borrowers own country – rates.
- Supranational: World bank, European Investment bank – rates.

- Covered bonds: Danish Mortgage bonds. – rates.
- Agency bonds: issued by semi government agencies often from the US (Federal home loan Mortgage corporation (Freddie Mac)) – rates.
- Corporates: cualquier empresa que haga bonos – credit.
- Emerging market bonds: Argentina
- MBS/ABS: Mortgage and asset backed securities defined 'Derivatives' and played a huge role in the financial market collapse in 2008 due to the very leveraged nature of these instruments.

FI assets are either classified as Rates or credit. Separate business, P/L and personnel (No lo entiendo)

Demands of the buy side: (no lo entiendo)

- Institutional asset managers: mainly governments for liquidity/ease of trading but some corporate bonds also (Corps much less liquid)
- Hedge funds: totally governments for liquidity reasons
- Wealth managers: Corporate bonds for higher yield/return
- Smaller EMEA Banks: trade all asset classes.
- Institutional asset managers: Mainly govs-executed via Tradeweb.
- Hedge funds: governments – executed via telephone (no trading platforms can handle the big size)
- Wealth managers: mainly credit (some EM)- Executed via BBG.
- Smaller EMEA banks: all - executed via BBG.

Tradeweb: rates

Bloomberg: all

MarketAxess: Corporates (institutional)

Current challenges of the market:

Liquidity: The current extreme difficulty of executing trades in a reasonable size in the Corporate Bond market – The buy side cannot transact. So accurate price information knowing where the market really is… is very valuable.

E.G – Toyota motor corp: shares trade in Japan, Singapore, US… 8 different SEs only… i.e., 8 locations = 8 securities to concentrate liquidity in. Toyota has 731 different bond issues.

It means trying to find a buyer and a seller of the same bond at the same time in roughly the same time (which is really difficult). No entiendo esta frase: a Corporate Bond problem not a Government Bond problem so 70% of Government Bond trading is electronic versus 30% of Corporates

Factors influencing a banks ability to hold a bond trading position: investment bank balance sheets, capital requirements. It wasn't a problem before 2008.

Investment banks has a risk position (long/short) in a bond it must set aside a certain amount of capital to cover that risk from a regulatory perspective (Basle 3). i.e., deutsche buys 10 mm Corp from client, it needs to set aside 4% of capital against it.

Pre 2008: deutsche corporate bond global balance sheet 4 billion $. Capital requirements of any corporate bond were 4% aprox.

Post 2008: Deutsche bank corporate bond global balance sheet 1 billion $. Capital requirements are now 8% approx.

With balance sheets now down and capital requirements high it means investment banks cannot hold bonds on their own trading book anymore (as they don't have the capital).

The buy side cannot trade with IBs in any size anymore. The standard dealer (IB) to client model is broken.

The market is considering an all to all model where any market participant can trade with another (Blackrock could trade directly with Fidelity,Citi with JPM ! There were a multitude of new electronic initiatives proposed but there will only be 2 or 3 winners.)

**Week 14**

- Part 1: Central Banks structure & goals.

Central banks are the most important players in the financial markets, as they oversee the monetary policy. As their actions affect interest rates, the amount of credit and the money supply.

Origins of central banks:

The Bank of Sweden was established in 1668, with its main function being lending money to the government. With the rise of global trade in the 17th century, more central banks were needed due to the volume of international payments. The funding of the bank of England (1694) marks the origins of central banking. With time their functions evolved to safeguard monetary stability.

To avoid the risk of power concentration, the US Federal bank (1913) distributed its power into 12 banks.

Most emerging market economies established their central banks after WWII.

Over the last two centuries, the function of central banks throughout the world expanded to regulating the value of the national currency, financing the government, and acting as a 'lender of last resort' to banks suffering from liquidity/credit crises.

Who should own central banks?

- Arguments 4 public ownership:
    - Central banks act in the ultimate public interest
    - Private ownership bias central banks towards profit-making
    - The global financial crisis highlighted concerns that the profit making target of private shareholders could hamper them from saving the financial sector during financial crises.
- Arguments 4 private ownership:
    - Guarantees central banks independence.
    - Private owners would be required to recapitalize the central bank in the case of losses which lifts this burden off the fiscal budget.

Variations in the functions and structures of central banks:

There are differences in the structure and policy tools that each bank adopts depending on the level of sophistication of the banking and financial sectors. Central banks have taken on increasing responsibilities which required more independence from fiscal authorities and political institutions

European system of central banks:

ECB came into existence on June 1, 1998. All of the states of the European union have to comply with a set of economical and legal conditions. In January 1, 1999, only 11 EU members had adopted the euro, all of the eurozone retain their own banking systems.

Decision making bodies of the ECB:

*Governing Council monetary policy fortnightly decision meeting*

*After meeting ECB holds a press conference to explain monetary policy decisions and rationale.*

- So European Bond markets will be quiet in anticipation of the monetary policy announcement.
- Will they raise/lower/keep unchanged short-term interest rates?
- If interest rates go up, bond yields will rise in sychronisation and bond prices will fall.
- It is equally important for bond markets what the ECB **'says'** at the press conference as much as what they **'do'**. *Is it Hawkish or Dovish?*

How Monetary Policy is conducted within the ECB:

The main objective of the ECB is to maintain price stability in the economies of the EU. Price stability is very important for economic growth and job creation; thus, the ECB maintains independent from governments. To achieve this objective the ECB aims to maintain a medium-term inflation rate close to 2% (Euro area annual inflation is currently 8,5%!). It uses conventional and unconventional monetary tools to achieve this.

- Conventional: 1) open market operations; 2) standing facilities to provide and absorb overnight liquidity; 3) minimum or required reserve requirements for credit institutions.
- Unconventional: 1) emergency liquidity assistance (ELA) - that provides liquidity and loans exceptionally to solvent banking and financial institutions that are facing temporary liquidity problems. 2) **quantitative easing**, where central banks buy sovereign bonds and/or other financial assets from commercial banks and financial institutions to increase money supply and stimulate the economy...

Explain quantitative easing: (5points)

- Unconventional monetary policy of the ECB 1 mark
- Involves ECB purchasing of bonds from banks 1 mark
- If a customer (ECB) buys a bond he is providing funds to bond seller 1 mark
- Banks are then meant to lend such funds out into the economy 1 mark
- To stimulate economic growth 1 mark
- The ECB finished its monthly €2.5tn QE stimulus programme December 2018 but restarted QE Nov 2019 due to European/Global growth slowdown concerns.Now Covid-19 related.1 mark
- Note: The ECB no longer conducts QE (Feb 2023) given it is an expansionary policy and it is now in a restrictive policy mode fighting high inflation (1 mark).

Segun ICADE: quantitative easing is a monetary policy used by the central bank in which it purchases long term government bonds or other financial assets to inject money in the economy.

The federal reserve system:

It is subject to oversight from Congress that periodically reviews its activities. The fed supervises the nations financial institutions and serves as their banker.

There are 12 Fed banks which act as the operating arm of the Fed that carry out most of its activities and implement the Fed's **dual mandate** of long-term price stability and macroeconomic stability through creating jobs.

The federal open markets committee holds eight meetings a year, where they execute monetary policies for the federal reserve system and were they review economic conditions. They also decide whether to use expansionary or contractor policies. FOMC changes the funds rate. The stock markets react immediately to FOMC meetings.

Differences between ECB and Fed:

Both bind several regional banks together. Both independent and decentralized. ECB supports political independence and makes policies independently from the political authorities. The fed is independent of the gov and reports to congress.

However, there are some differences:

1) Primary objective of the ECB: hold price stability. Feds dual mandate and monetary policy: deliver price stability and support economic growth.
2) The monetary operations of ECB are not centralized but conducted by the national banks, while Fed is centralized.
3) The ECB is not involved in supervision and regulation of financial institutions as these tasks are left to the individual countries in the European Monetary Union, while the Federal Reserve is involved in these areas.

Central Bank independence:

There are 3 arguments for central bank independence:

1. Focus on potential inflationary biases that are likely to exert themselves as a result of political pressure to boost output in the short run i.e. before an election and reversed after an election leading to 'boom' & 'bust'.
2. Public generally distrusts politicians in regard to making politically motivated decision and their lack of expertise in conducting monetary policy.
3. Politicians often opt for more central bank independence when there is disagreement between policymakers regarding unpopular macroeconomic decisions (to avoid criticism)

Main argument against central bank independence is that macroeconomic stability can be best achieved if monetary policy is properly coordinated with fiscal policy. As the government is responsible for the country's macroeconomic performance, it must have some control over monetary policy.

While the Federal Reserve has historically been more independent than most other central banks, the structure, and the level of political independence of the European Central Bank make it even more independent.

- Part 2: U.S Federal Reserve and conventional monetary policy tools

Set by the board of governor's bank reserves are one of the three main tools of monetary policy. The other two are: Open market operations and Discount loans held by banks.

Banks make loan funds to customers using deposits placed by customers. Banks only keep small amount of cash rather than lend out to clients. The fed makes one requirement: to keep a certain

number of deposits on hand to cover withdrawals (reserve requirements). Reserves consist of deposits at the fed + currency which is physically held by the bank.

Ex: (visto tb en icade)

- A Bank has $200MM deposits and is required to hold 10%. The Bank is allowed to lend out $180MM and keep $20MM as reserves at its account at the Fed*.
- By increasing the reserve requirement (i.e. 15% - bank can now lend out only $170MM) the Federal Reserve is essentially taking money out of the money supply (Reasons:economy expanding too fast /inflation a threat?)
- Conversely lowering the reserve requirement increases money supply > economic growth.

*The more reserves a bank has the more loans it can make*

** In reality the Reserve ratio calculation is a little more complex involving both deposits and loans*

Reserves are assets for banks but liabilities for the fed (when they increase reserves, it increases liquidity in the banking system. There are two categories: Required reserves and excess reserves. The Fed sets the required reserves ratio. The fed injects reserves into the banking system in two ways: 1) Open market operations 2) loans to banks (referred to as discount loans).

Open market operations: conducted through primary dealers.

- Purchase of bonds increases the money supply.

Open Market Purchase $100 million bonds from Primary Dealer

| Banking System | |
|---|---|
| Assets | Liabilities |
| Securities | |
| –$100 m | |
| Reserves (Deposits at the Fed) | |
| +$100 m | |

The size of the banking systems Balance Sheet has not changed, with total assets the same.However, the banking system's holdings of deposits/reserves at the Fed has increased.Since these can be lent out, liquidity in the banking system has increased.

Open Market Purchase $100 Million from Primary Dealer

| The Fed | |
|---|---|
| Assets | Liabilities |
| Securities | Reserves |
| +$100 m | +$100 m |

Expansion of Fed's Balance Sheet with increases in assets and liabilities.

The federal reserve balance sheet: an open market purchase leads to an expansion of the reserves in the banking system (because CB pays for bonds using reserves). While an open market sale leads to a contraction of reserves in the banking system.

- Making discount loans increases the monetary supply.

Discount Lending e.g. $100 MM Discount Loan to First National Bank. The Fed credits $100 MM to the banks reserve account.

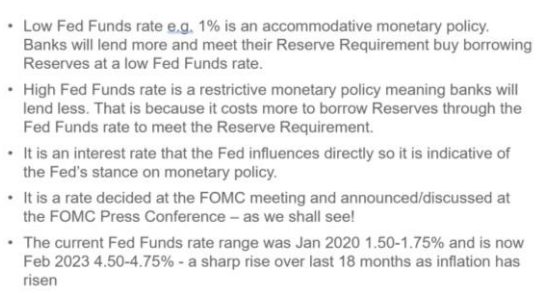
| The Fed | |
|---|---|
| Assets | Liabilities |
| Discount loans | Reserves |
| +$100 m | +$100 m |

Discount loans leads to an expansion of the reserves, which can be lent out, thereby leading to an expansion of liquidity in the banking system. When a bank repays its discount loan it reduces the total amount of discount lending, the amount of reserves decreases along with the liquidity in the banking system

- They decrease the monetary supply doing the reverse of these actions.

The market for reserves and the federal funds rate:

The federal funds rate – the interest rate on overnight loans on excess reserves from one bank to another. They are important because affect the cost of excess reserves (it influences the willingness of banks to build excess reserves and make bank lending according). Most important interest rate on the world!




If the fed funds rate is accommodative (low):

- Banking lending (money supply) will expand.
- Economy will grow.
- Corporate profitability will increase.
- Share prices/ stock market will rise.

- *So if the Fed makes 'dovish' comments at its Press Conference about future Fed Funds interest rate movements the stock market will **immediately** react (Bonds, US Dollar, Gold also).*

Conventional monetary policy tools: (repaso)

1) Open market operations:
    a. An open market purchase of bonds (US treasuries) causes the fed funds rate to fall.
    b. An open market sale causes fed funds rate to rise
    c. Dynamic: Change reserves and monetary base
    d. Defensive: Offset factors affecting reserves
    e. e.g. If a foreign country is expected to sell its US Treasury security holdings in exchange for US dollars, the Federal Reserve may decide to buy Treasury securities in advance in order to maintain the same level of US dollars.
    f. Typically uses REPOs for 2.

- REPOs: Repurchase agreements is a short term loan much used in the money markets where the seller agrees to buy back a security as a specific time and price. The seller pays a special interest rate known as REPO rate. Central Banks often use repos to boost money supply, buying Treasury bills or other government paper from commercial banks so the bank can boost their reserves and selling paper back later. When the central bank wants to tighten money supply, it sells paper first, and buys it back later, an agreement to lend securities rather than funds. *The party that is selling securities is doing a Repo, and the party that is buying securities is doing Reverse Repo.*

    g. Advantages of Open Market operations: Fed has complete control, Flexible and precise, easily reversed, implemented quickly.

1) If the Federal Reserve wants to permanently expand liquidity/reserves in the banking system, it will

A) purchase government securities.
B) raise the discount rate.
C) sell government securities.
D) raise reserve requirements.

**Answer: A**

2) If the Federal Reserve wants to drain reserves from the banking system, it will

A) purchase government securities.
B) lower the discount rate.
C) sell government securities.
D) lower reserve requirements.

**Answer: C**

Inside the fed: a day at a training desk: no lo voy a resumir porque supongo que no entra

2) Discount policy
    a. The Fed's offers Discount Loans, through the **discount window**, are:
        i. Primary Credit: Healthy banks
        ii. Secondary Credit: Given to troubled banks experiencing liquidity problems.
    b. Banks do not like to borrow from the Discount Window (Secondary Credit) as
    c. Higher than Fed Funds (It's a penal rate!)
    d. It shows your firm is in trouble.No one else will lend.
    e. Lender of Last Resort Function
        i. To prevent banking panics
        ii. Example: Continental Illinois
        iii. The unusual treatment of Continental Illinois gave popular rise to the term "too big to fail."
        iv. Can also help avoid panics
            1. Ex: Market crash in 1987 and terrorist attacks in 2001 - bad events, but no real panic in our financial system
            2. After the Financial Crisis 2007-09 the Fed lowered the spread on the discount rate to 50 basis points, and then to 25.
        v. But there are costs!
        vi. Banks and other financial institutions may take on more risk (moral hazard) knowing the Fed will come to the rescue i.e. 'The Greenspan Put'
3) Changing the reserve requirements:
    a. Reserve Requirements are requirements put on financial institutions to hold liquid (vault) cash again checkable deposits.
    b. Everyone subject to the same rule for checkable deposits:
        i. 3% of first $48.3M, 10% above $48.3M
        ii. Fed can change the 10%
    c. Rarely used as a tool
        i. Raising causes liquidity problems for banks
        ii. Makes liquidity management unnecessarily difficult...

- Part 3: US Federal reserve and non-conventional monetary policy tools

The global financial crisis challenged the Fed's ability to stabilize the economy, which meant that they had to use non-conventional tools.

Liquidity provisions: discount window expansion – discount rate lowered several times; term auction facility – loan facility (400$ billion to institutions); new lending program – included to IBs, lending to promote purchase of asset-backed securities.

Large scale asset purchases **(Quantitative easing):**

- Nov 2008 – QE1 established, purchasing $1.25 trillion in MBSs. (mortgage-backed securities)
- Nov 2010 – QE2, Fed purchases $600 billion in Treasuries, lower long-term rates.
- Sept 2012 – QE3, Fed commits to buying $40 billion in MBSs each month.
- (ECB had a Euro 2.5 Trillion QE programme December 2018 and modestly restarted QE again in Nov 2019.But ECB QE was later and less aggressive than Fed)

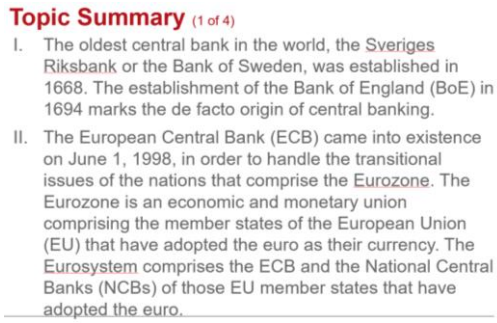
QE – central banks buy assets (bonds typically) to increase its price and lower its yield, making it easier for people to borrow money and take risks. In short, QE increases monetary supply and lowers interest rates, increasing the central bank's balance sheets. There were three major QE made by fed (above)

It is powerful to stimulate the economy, but can it lead to inflation?

How does the Federal Reserve control interest rates on Fed Funds?

The Federal Reserve cannot directly control interest rates on Fed Funds. **1 mark** It can and does indirectly influence them by adjusting the level of reserves available to banks in the financial system. **1 mark** The Fed can increase the amount of money in the system by buying securities, **1 mark** thus lowering interest rates**. 1 mark** Alternatively, the Fed can remove reserves by selling securities, **1 mark** and then interest rates will increase. **1 mark**

The Federal Reserve will engage in an outright purchase if it wants to _increase_ reserves _permanently_ in the banking system.






**Week 15 – The Foreign Exchange market**

- Part 1: FX intro

In the mid-1980s, American businesses became less competitive relative to their foreign counterparts. By the 2000s, though, competitiveness increased. Why?

By the 1990s and 2000s, the dollar weakened, so American goods became cheaper and American businesses became more competitive.

Financial institutions generally engage in foreign exchange trading activities for the following purposes:

- The buying and selling of foreign currencies on behalf of their customers so as to allow their customers to engage in and complete international trading transactions with counterparties.
- The buying and selling of foreign currencies on the behalf of their customers (or on its own behalf) in order to take positions of a speculative nature in foreign exchange or other financial instruments.
- The buying and selling of foreign currencies for hedging purposes to offset customer (or its own) exposure to any given currency.

FX fluctuations matter – sometimes it is more expensive to vacate at the us because the dollar is more expensive.

- Spot Transactions – involving immediate (2-day) exchange of currencies
- Forward Transactions – exchange some time in future
- Currency increases in value=appreciation
- Currency decreases in value=depreciation
- Beginning 1999 1 EUR=$1.18
- June 16 2016 EUR=$1.11
- The Euro depreciated by 6% (1.11-1.18/1.18=0.06)
- USD appreciated by 6%
- This affects the price of US goods in Europe and vice versa.

*A strengthening of a currency (EUR v USD) makes foreign /US goods cheaper in Europe BUT makes European goods more expensive in the US.*

- FX traded in over-the-counter market
    1. Involve buying / selling cash denominated in different currencies.
    2. Trades involve transactions in excess of $1 million made by institutions e.g. banks
    3. Typical retail consumers i.e.you/me buy foreign currencies from retail dealers, such as Western Union / American Express/ high street banks.

- FX volume exceeds $5 trillion per day!!

- Part 2: FX in the long run – the theory

Exchange rates are determined in the markets by the interaction of supply and demand – law of one price.

- The Law of One Price states that the price of an identical good will be the same throughout the world, regardless of which country produces it.
- Example: American steel costs $100 per ton, while Japanese steel costs 10,000 yen per ton.
- For the Law of One Price to hold, the exchange rate between the Yen and the Dollar must be 100 yen per dollar, so that one ton of American steel sells for 10,000 Yen in Japan (the price of Japanese steel) and one ton of Japanese steel sells for $100 in the US (the price of US steel) in the Unites States.
- If the exchange rate were 200 Yen to the Dollar, Japanese steel would sell for $50 in the US or half the price of American steel, and American steel would sell for Yen 20,000 in Japan, twice the price of Japanese steel.
- Because American steel is identical to Japanese steel but would be more expensive in both countries, the demand for American steel would be zero.
- Given the fixed dollar price for American steel, the resulting excess supply of American steel would only be eliminated if the exchange rate falls to 100 yen per dollar, making the price of American steel and Japanese steel the same in both countries.

The theory of purchasing power parity (PPP)

- The theory of PPP states that exchange rates between two currencies will adjust to reflect changes in price levels.
- PPP $\Rightarrow$ Domestic price level $\uparrow$ 10%, domestic currency $\downarrow$ 10%
- 10% rise in price of Japanese Steel =10% fall in Yen versus USD
    - Application of law of one price to price levels
    - Works in long run, not short run
- Problems with PPP
    - All goods are not identical in both countries (i.e., Toyota versus Chevy)
    - Many goods and services are not traded (e.g., haircuts, land, etc.)
    - Assumes trade barriers are low.

Trade barriers affect on exchange rates:

- US increases the tariffs (taxes on imported goods) on French wine.
- So French wine becomes more expensive in US.
- The increase in tariffs increases demand for US wine domestically.
- The USD tends to appreciate in the long run because American wine will still sell well despite a higher value of the dollar.

- Part 3: FX on the short run – the practice.

Changes in interest rates are often cited in the press as affecting exchange rates. However, it is the interest rate on domestic banks deposits in terms of foreign banks what is important. *In short-run, decisions to hold US or foreign assets have a much greater influence on FX rates than demand for exports / imports*

- **Scenario 1**
- EUR bank 12-month deposit rates =2%
- US bank 12-month deposit rates =2%
- EUR/USD =1.00

- **Scenario 2**
- EUR bank 12-month deposit rates =2%
- US bank 12-month deposit rates =12%
- As an European investor seeking returns what will you do?

- *Sell EUR / Buy USD*
- *Deposit those $ in US bank accounts*
- *EUR weakens / USD strenthens*

Why are exchange rates important?

When the currency of your country appreciates relative to another country, your country's goods prices increase abroad and foreign goods prices cheapen in your country. (Makes domestic business less competitive, benefits domestic consumers). Ejemplo tesla 1 usd = 2 gbp

When the currency of your country appreciates relative to another country, your country's goods prices ↑ abroad **and foreign goods prices ↓ in your country.**

**Question:** A stronger dollar benefits _American consumers_ and hurts _American businesses__.

A) American businesses; American consumers

B) American businesses; foreign businesses

C) American consumers; American businesses

D) foreign businesses; American consumers

**Question:** Increased demand for a country's _exports_ causes its currency to appreciate in the long run, while increased demand for _imports_ causes its currency to depreciate.

A) imports; imports

B) imports; exports

C) exports; imports

D) exports; exports

**Question:** When the exchange rate for the euro changes from EUR/USD 1.00 to EUR/USD 1.20, then, holding everything else constant, the euro has

A) appreciated and German cars sold in the United States become more expensive.

B) appreciated and German cars sold in the United States become less expensive.

C) depreciated and American wheat sold in Germany becomes more expensive.

D) depreciated and American wheat sold in Germany becomes less expensive.

**Question:** If the dollar depreciates relative to the Swiss franc,

A) Swiss chocolate will become more expensive in the United States.

B) American computers will become less expensive in Switzerland.

C) Swiss chocolate will become cheaper in the United States.

D) both A and B of the above will happen.

**Question:** When the value of the British pound changes from GBP/USD 1.50 to GBP/USD 1.25, the pound has _depreciated_ and the dollar has _appreciated_.

A) appreciated; appreciated

B) depreciated; appreciated

C) appreciated; depreciated

D) depreciated; depreciated

- Part 4: FX Spot trading

One counterparty **buys** one currency for another which is **sold** by the other counterparty, at a specified date, for a specified rate. Trade investment, hedging (risk management strategy), speculation.

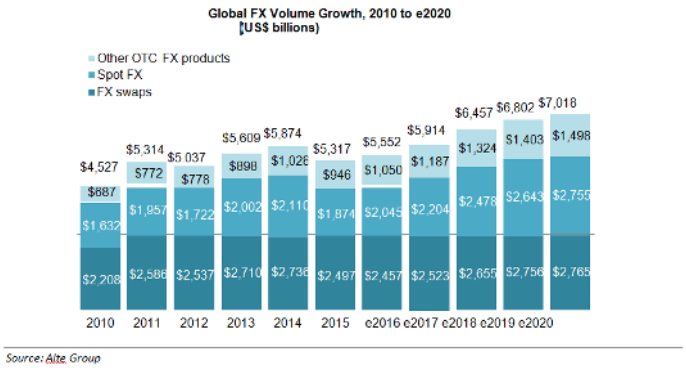
Major FX players: Commercial banks, investment banks, central banks, corporate treasurers, hedge funds, Thompson Reuters/ Refinitiv, EBS/ICAP, investment bank portals.

What are foreign exchange rates?

- Spot transactions: in a date (2 business days from today)
    - I trade today e.g., **Buy USD 1,000,000 Sell EUR**
    - In 2 days' time I will receive the USD and deliver EUR
    - *'Trade Date' Monday – 'Value Date' Wednesday*

- Forward transactions: to meet in a future currency need.
    - I trade today **e.g., Buy USD 1,000,000 Sell EUR** but request a specific settlement date in the future e.g. March 1st 2021, Nov 1st 2021, 5th Jan 2022 depending on my business needs i.e. I might have to pay a customer or supplier USD 1 MM on Nov 1st, 2021, but my business is EUR based.

Trading volume by product



Spot quotation method:

- Direct: USD is the base currency (105.6 yen for 1 usd)
- Indirect: USD is the quoted currency (1 euro buys 1,253 dollars)
- USD is the base currency except for: EUR, GBP (Cable), AUD & NZD, small countries that use the sterling.

## Which Side of the Price?
## EUR/USD is 1.2590/95
## BID 1.2590
## Offer 1.2595

| | BID | OFFER |
|---|---|---|
| **Market Taker** | Sells Base | Buys Base |
| e.g. Client / Fund Manager | 1.2590 | 1.2595 |
| **Market Maker** | Buys Base | Sells Base |
| e.g Investment Bank | | |

Market Taker Says: "YOURS" "MINE"

"Yours" and "Mine" refer to the BASE Currency

i.e. "The Euros are "Mine"

**Which Side of the Price?**

Garage… £1,250 - £1,500

Bank…… EUR/USD 1.10 - 1.12

1. You the client (in financial terms e.g. the fund manager) sell base currency on the Bid – the left hand side of the quote –the maket-maker/investment bank buys

2.You the client (in financial terms e.g. the fund manager) buy base currency on the offer/ask – the right hand side of the quote – the maket-maker/investment bank sells

## Question

JP Morgan Investment Bank are quoting the following GBP/USD rates.
GBP/USD 1.2990 BID - 1.3010 OFFER

You the client /Fund Manager want to **sell** GBP10 MM
What price will you trade at ?
Think if you were selling a Toyota Yaris? £1.2500 - £1.5000

A) 1.2990
B) 1.3010
**Answer A**

Investment Banks are quoting the following GBP/USD rates.

Bank A GBP/USD 1.2990 BID - 1.3020 OFFER

Bank B GBP/USD 1.3010 BID - 1.3030 OFFER

Bank C GBP/USD 1.2995 BID - 1.3025 OFFER

You, the Client, wish to BUY GBP SELL USD.

What is the best price you, the client to the bank, can deal at?

A) 1.2995

B) 1.3020

C) 1.3025

D) 1.2990

- Part 5: FX Forwards and Swaps

Players: Banks, money brokers, corporate treasurers, Thompson Reuters/ EBS/ Portals

Forwards outright : “A deal for any value later than a spot”. Which are quoted from banks to non-bank customers.

Corporate clients have a large demand for Outrights in order to finance trade and to hedge their foreign currency exposure.

Forex swap: Two legs (near and fear). Buy Near and Sell Far OR Sell Near and Buy Far. (B&S or S&B). Like a REPO or reverse REPO.

Two trades take place, one on a near date (first leg, usually spot) the second on a far date (second leg). The second leg is the reverse of the first.

- Sell USD v JPY for Spot USD 10 MM
- Buy USD v JPY for 1 month’s times.
- *Normally the Base currency amounts are identical and the Quoted currency amounts differs between the two legs.*

EXAMPLE:

- Companies may use FX Swaps to avoid foreign exchange risk.
- A British Company may own / be long EUR from sales in Europe but operate primarily in Britain using GBP.
- However, they know that they need to pay their manufacturers in Europe in 1 month.
- They could spot sell their EUR and buy GBP to cover their expenses in Britain, and then in one month spot buy EUR and sell GBP to pay their business partners in Europe.
- However, this exposes them to FX risk. If Britain has financial trouble and the EUR/GBP exchange rate moves against them, they may have to spend a lot more GBP to get the same amount of EUR.
- Therefore they create a 1 month swap, where they Sell EUR and Buy GBP on spot and simultaneously buy EUR and sell GBP on a 1 month (1M) forward.
- This significantly reduces their risk. The company knows they will be able to purchase EUR reliably while still being able to use currency for domestic transactions in the interim

How do we determine the price of a leg?

- Forex Swaps/Forwards
- ADD or SUBTRACT points from the Spot Rate

-45/-43 **DEDUCT the Points from Spot**

**Base Currency Rates are HIGHER**

45/48 **ADD the Points to Spot**

**Base Currency Rates are LOWER**

e.g.If SPOT is 1.3280
The Forward or Far Leg adjustment is -45
The Forward or Far Leg price is 1.3235

How do you calculate forward FX rate points? Interest rates are key.

- Forward Rates ONLY reflect interest rate differentials.
- There is no room for expectations! E.G.
- US interest rates are 4%
- EUR interest rates are 0%
- If you want to BUY USD/EUR would you rather have your USD now or in 12 months? Answer NOW
- To compensate you (and avoid arbitrage) if you BUY USD trade today, value date 12 months - the exchange rate will be adjusted by 4% in your favour.

Broken dates: In practice, many banks and corporates need quotes for periods intermediate between the standard run (or fixed periods i.e. not 1, 2 or 3 months' time! )

- They want to trade for a specific date not 12 months – e.g. 10 months and 11 days.
- They use a process of linear interpolation to calculate the quotes.

i.e., 311/360 x 4%

**Week 16: The money markets**

- Part 1: Money markets intro

Definition: The term money market is inaccurate (as money (currencies) is not traded in money markets). The securities in the money market are short term with high liquidity (close to being money).

1. Usually sold in large denominations ($1,000,000 or more - 10 MM, 20 MM or 50 MM common)
2. Low default risk
3. Mature in one year or less from their issue date, although most mature in less than 120 days
4. OTC
5. Active secondary market (c.f. a small 200 million 20-year Can$ Corporate Bond issued 12 years ago!)

Why do we need them? The banking industry should handle the needs for short-term. Banks have information advantage, while being high regulated. Creates a distinct cost advantage for money markets over banks.

Cost advantages: reserve requirements create additional expense for banks that money markets do not have. Regulations on the level of interests banks could offer depositors lead to a significant growth in money markets (especially in the 70s and 80s). When interest rates rose, depositors moved their money from banks to money markets. Plus the cost structure of banks limits their competitiveness to situations where their informational advantages outweighs their regulatory costs.

Purpose:

- Investors: provides a place for warehousing surplus funds for shorts periods of time
- Borrowers: source a low-cost source of temporary funds.
- Corporations and U.S. government use these markets because the timing of cash inflows and outflows are not well synchronized.

- Part 2: Money markets instruments.

1) Treasury bills

T-bills have 28-day maturities through 12- month maturities. Using discounting (pays less than what ill be worth in the future, making a profit at the final price)

- You pay $999.813 for a 28-day T-bill. It is worth $1,000 at maturity. What is its discount rate?
- $i_{discount} = (1{,}000 - 999.813) / 1{,}000 \times 360/28 = 0.00240 = .24\%$

T-Bills are auctioned to dealers every Thursday. The treasury may accept competitive and non-competitive deals, and the price everyone pays is the highest yield paid.

Mini case: treasury bills auctions go to haywire: In 1991, Salomon Smith Barney violated Treasury auction rules to corner the auction on an $11 billion issue. Several top Salomon officials were forced to retire (or fired) as a result of the incident.The Treasury also changed the auction rules to ensure a competitive auction.

2) Federal funds

Short-term funds transferred (loaned or borrowed) between financial institutions, usually for a period of one day. Used by banks to meet short-term needs to meet reserve requirements. With a similar interest rate as T-bills.

3) Repurchase agreements:

Work the same as fed funds but non bankers can participate. A firm sells Treasury securities, but agrees to buy them back at a certain date (usually 3–14 days later) for a certain price. This makes REPOs a short-term collateralized loan. This is one market the Fed may use to conduct its monetary policy, whereby the Fed purchases/sells Treasury securities in the repo market.

4) Negotiable certificates of deposit

A bank-issued security that documents a deposit and specifies the interest rate and the maturity date. Denominations range from $100,000 to $10 million.

5) Commercial paper

Unsecured promissory notes, issued by corporations, that mature in no more than 270 days. Raised in the 80s because of the high cost of bank loans. Volume fell during the 2008 and 2020 recessions. Annual market is about 0,85 trillion.

Asset-backed commercial paper (ABCP): special type played a key role in the financial crisis in 2008 backed by securitized mortgages, often difficult to understand, accounted for about $1 trillion. When the poor quality of the underlying assets was exposed, a run on ABCP began. Because ABCP was held by many money market mutual funds (MMMFs), these funds also experienced a run. The government eventually had to step in to prevent the collapse of the MMMF market.

Exam question:

**What is Commercial Paper?**

- Commercial paper is an unsecured note/security **1 mark** issues by corporations 1 mark with a maximum maturity date of 270 days **1 mark** .
- The market is essential since many foreign contracts call for payment is U.S. dollars due to the stability of the dollar, relative to other currencies **1 mark**

6) Bankers' acceptance

An order to pay a specified amount of money to the bearer on a given date. Bank acts as a middleman between 2 corporate clients. The bank substitutes its creditworthiness for that of the buyer (who must pay in a trade finance transaction).

7) Eurodollars

Represent dollar denominated deposits held in foreign banks. The market is essential since many foreign contracts call for payment is U.S. dollars due to the stability of the dollar, relative to other currencies. Rapid growth because depositors receive a higher rate of return on a dollar deposit in the Eurodollar market than in the domestic market.

Multinational banks are not subject to the same regulations restricting U.S. banks and because they are willing to accept narrower spreads between the interest paid on deposits and the interest earned on loans. (NO ENTIENDO)

Eurodollar rates:

- London interbank bid rate (LIBID)
  - *The rate paid by a bank if another bank lends funds*
- London interbank offer rate (LIBOR)
  - *The rate paid by a bank who borrows funds*
- Time deposits with fixed maturities
  - *Largest short term security in the world*

  - e.g. 3-month Eurodollar deposits
  - LIBID 2.25% LIBOR 2.50%

Birth of the Eurodollar: The Eurodollar market is one of the most important financial markets, but oddly enough, it was fathered by the Soviet Union. In the 1950s, the USSR had accumulated large dollar deposits, but all were in US banks. They feared the US might seize them, but still wanted dollars. So, the USSR transferred the dollars to European banks, creating the Eurodollar market.

Other eurocurrencies:

- Although the Eurodollar market is the biggest due to the international popularity of the US Dollar for trade any currency held outside the domestic country becomes a Eurocurrency e.g. Japanese Yen held in NY or London becomes 'Euroyen'.
- Note: This terminology / product has nothing to do with the EUR currency of Europe.
- Note: This concept is the same in the Eurobond market. e.g.USD Eurobonds are bonds that trade outside the US. e.g. GBP Eurobonds are bonds that trade outside the UK.

Comparing market securities: Liquidity is also an important feature, which is closely tied to the depth of the secondary market for the various instruments.

| Money Market Security | Issuer | Buyer | Usual Maturity | Secondary Market |
|---|---|---|---|---|
| Treasury bills | U.S. government | Consumers and companies | 4, 13, 26, and 52 weeks | Excellent |
| Federal funds | Banks | Banks | 1 to 7 days | None |
| Repurchase agreements | Businesses and banks | Businesses and banks | 1 to 15 days | Good |
| Negotiable CDs | Large money center banks | Businesses | 14 to 120 days | Good |
| Commercial paper | Finance companies and businesses | Businesses | 1 to 270 days | Poor |
| Banker's acceptances | Banks | Businesses | 30 to 180 days | Good |
| Eurodollar deposits | Non-U.S. banks | Businesses, governments, and banks | 1 day to 1 year | Poor |

| Interest Bearing Instruments | Discount Instruments | Derivatives |
|---|---|---|
| Interbank Deposits | Treasury Bill, T-Bill | Forward Rate Agreement, FRA |
| Certificates of Deposit (CD) | Commercial Paper, CP | Interest Rate Futures |
| Repurchase Agreement (REPO) | | Overnight Index Swaps |

Money market deposits in the foreign exchange market:

One counterparty – the borrower – borrows a single currency from the other counterparty – the lender, at a specified rate, for a specified period of time. Money Markets are overnight up to and including 12 months. Debt Market maturities are over 12 months and can extend to 100 years!

| Money Markets | Debt Markets | Equity Markets |
|---|---|---|
| Short Term | Medium to Long term | Long Term |
| | Non-permanent funding | Permanent funding |
| 0 > 1 Year | 1-30 years* exceptions | |

- Part 3: Money markets in practise

Definition: deposit market – a wholesale market for the borrowing and lending of money. The period ranges from overnight to 1 year.

  - Short dates: ON, TN, SN, SW
  - Fixed dates: 1M, 2M,3M, 6M,9M, 1Y
- Bid: the rate that the bank is willing to borrow at
- Offer: the rate that the bank is willing to lend at

Primarily OTC, contributed by banks and brokers.

Simple interest: Not compounded, no collateral.

$$\text{Interest} = \frac{\text{Amount} \times \text{Rate} \times \text{No. of Days}}{\text{Day Basis} \times 100}$$

e.g.

$$\frac{10{,}000{,}000 \times 1.82 \times 90}{360 \times 100} = 45{,}500$$

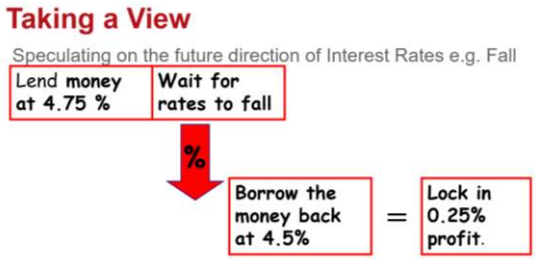
Four banks are quoting these prices.From which bank would you borrow and which would you lend to?

- a) 2 9/16 - 2 5/8%
- b) 2 5/8 - 2 11/16%
- c) 2 9/16 - 2 13/16%
- d) 2 1 /2 - 2 9/16%

a) 2 9/16 - 2 5/8%
b) 2 5/8 - 2 11/16% Lend
c) 2 9/16 - 2 13/16%
d) 2 1 /2 - 2 9/16% Borrow

LIBOR: London interbank offered rate. Rates polled at 11 AM, Fixed by ICE, 16 banks polled, average of mid.

EURIBOR: Euro interbank offered rate. Rates polled at 11 AM (brussels), aprox 50 banks polled, average of all. Can be 360 or 365 days basis




**Week 7: Bond markets 1**

- Part 1: Intro, risk structure, interest rates.

In this topic we will examine the different rates that we observe for financial products. We will examine bonds that offer similar payment but at a different stream: this is because the risk structure of interest rates. Next we will look at the different rates required on bonds with different maturities, as we typically observe higher rates on longer maturity bonds (aka term structures of interest rates) we study treasury bonds to minimise the impact of other risk factors.

Risk structures of interest rates:

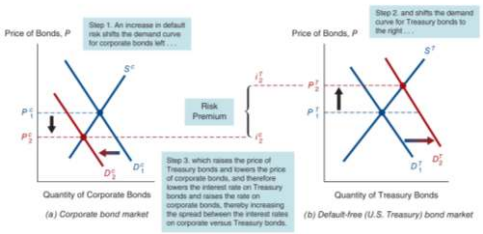
Two important features of the interest rate behaviour of bonds:

- Rates on different bonds change from one year to the next
- Spreads on different bond categories change from one year to the next (what are spreads?)

We will look at three specific risk factors that examines this features:

- Default risk
  - U.S. Treasury bonds have usually been considered to have no default risk because the federal government can always increase taxes to pay off its obligations (or just print money). Bonds like these with no default risk are called **default-free bonds.**
  - But are these bonds truly **default-free bonds?** During the budget negotiations in Congress in 1995–1996, and then again in 2011–2013, the Republicans threatened to let Treasury bonds default, and this had an impact on the bond market. If these bonds were truly "default-free," we should not have seen any reaction.
  - The spread between the interest rates on bonds with default risk and default-free bonds, called the **risk premium,** indicates how much additional interest people must earn to be willing to hold that risky bond.
  - A bond with default risk will always have a positive risk premium, and an increase in its default risk will raise the risk premium.

**Figure 5.2** Response to an Increase in Default Risk on Corporate Bonds



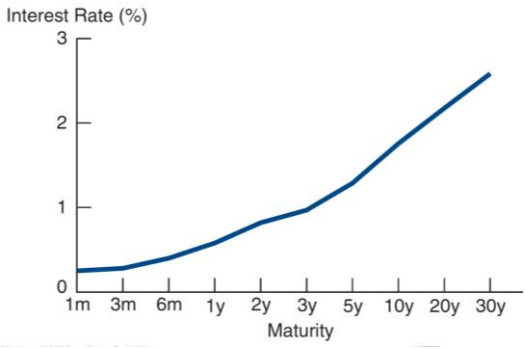

- Default risk is an important component of the size of the risk premium. Because of this, bond investors would like to know as much as possible about the default probability of a bond. One way to do this is to use the measures provided by credit-rating agencies: Moody; standard & Poors and Fitch are main firms. (ver table de ratings)

- Liquidity
  - The more liquid an asset is, the more desirable it is (higher demand), holding everything else constant.
  - The differences between interest rates on corporate bonds and Treasury bonds (that is, the risk premiums) reflect not only the corporate bond's default risk but its liquidity too. This is why a risk premium is sometimes called a *risk and liquidity premium.*
  - Liquidity risk: risk that the investor will have to sell the bond below its market value(revealed by recent transaction or indicated on trading screens).
  - The primary measure of liquidity is the size of the bid-asked spread: difference between the asked price and the bid price
    - Ask/Offer price: price at which the dealer is willing to sell a security.
    - Bid price: price at which the dealer is willing to buy a security.
  - A liquid market has a small bid-ask spread which does not increase materially for large transactions. **Market bid-ask spread = lowest ask - best bid**
    - Bid /Ask spreads.
    - Marking Positions to Market
    - The role of Investment Banking Risk Management departments
    - When it goes wrong: Baring Brothers, Société Générale.
    - Banks' ability to provide liquidity depends on capital constraints.
    - 99% of all bonds are held by Asset Managers not Investment Banks
- Income tax considerations
  - Municipal bonds tend to have lower rates than treasuries, as Municipal Bond are US State issued bonds – their interest payments are tax-free to US investors unlike all other bonds e.g. *A $1000 Treasury coupon payment is taxed at 35%*
    *A $1000 Municipal Bond coupon payment is tax free in US.*
  - Munis can therefore yield less than US Treasuries even though the default risk and liquidity risk is higher.
- Part 2: Term structure of interest rates & yield curve.

Now we turn to another important influence on interest rates – maturity. Both bonds with everything equal tend to have different return rates (all else equal)

The U.S federal reserve directly influences short term rates and indicates long term rates. Treasury issues: T-Bills (1 mth, 3 mth, 6 mth) 2 year, 5 year, 30 year bonds.

The yield curve is the relationship between the yield and the maturity of treasury securities. “Off-the-run” treasuries require higher yields than “on-the-run”.




The interest rates for different maturities move together. Yields curves tends to have steep upward slope when short rates are low and downward slope when short rates are up. Yield curve is typically upward sloping.

Three theories of term structure:

1) Expectations theory
    a. Assets that the market sets yields based on expectations of future interest rates: A rising (falling) term structure reflects an expectation that future interest rates will rise (decline)

According to the expectations theory of the term structure,

A) when the yield curve is steeply upward-sloping, short-term interest rates are expected to rise in the future.

B) when the yield curve is downward-sloping, short-term interest rates are expected to decline in the future.

C) buyers of bonds prefer short-term to long-term bonds.

D) all of the above.

E) only A and B of the above.

Answer: E

2) Market segmentation theory
    a. There are different maturity sectors of the yield curve. Each maturity sector is segmented (independent) from the rest of the sectors. Within each maturity sector the interest rate is determined by the supply and demand for funds. Many regulations force participants to match maturities and risks
    b. Implication: Any shape is possible for the yield curve. Offer explanation of how the term structure can be “humped”.
    c. Shortcomings: Does not explain why interest rates on different maturities move together or 2) why yield curves tend to be upward sloping when short-term interest rates are low and to be inverted when short-term interest rates are high

According to the market segmentation theory of the term structure,

A) the interest rate for bonds of one maturity is determined by the supply and demand for bonds of that maturity.

B) bonds of one maturity are not substitutes for bonds of other maturities; therefore, interest rates on bonds of different maturities do not move together over time.

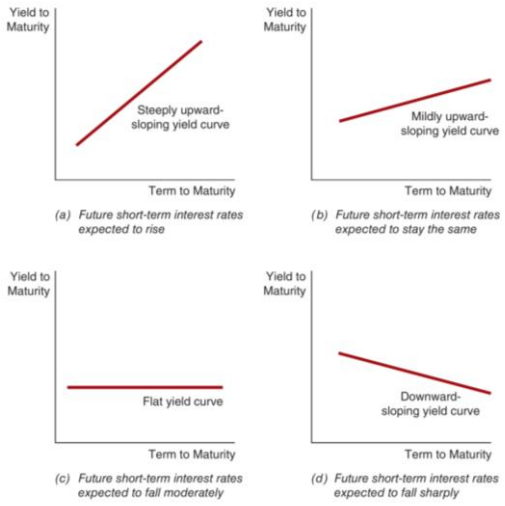
C) investors' strong preference for short-term relative to long-term bonds explains why yield curves typically slope upward.

D) all of the above.

E) none of the above.

Answer: D

3) Liquidity premium theory (combines 1 and 2)
    a. Market participants want to be compensated for the interest rate risk associated with holding longer term bonds. The longer the maturity, the greater the price volatility when interest rates change (investors demand to be compensated
    b. Term structure of interest rates is dependent on: 1) expectations of future interest rates 2) a yield premium for interest rate risk
    c. Upward sloping term structure: Rates are expected to rise, remain unchanged or even fall, but we get an upward slope due to a a yield premium increasing with maturity




Shapes of the **Treasury yield curve**

• Upward sloping or normal yield curve: yield increases with maturity (typical)

• Inverted: yield decreasing with maturity

• Flat: yield roughly the same regardless of maturity

• Humped: increasing then decreasing for longer maturities

Evidence on term structure:

Initial research (early 1980s) found little useful information in the yield curve for predicting future interest rates. Recently, more discriminating tests show that the yield curve has a lot of information about very short-term and long-term rates, but says little about medium-term rates

- Part 3: Term structure of interest rates and yield curve shifts.

Yield curve risk: There is not one interest or yield in the economy.

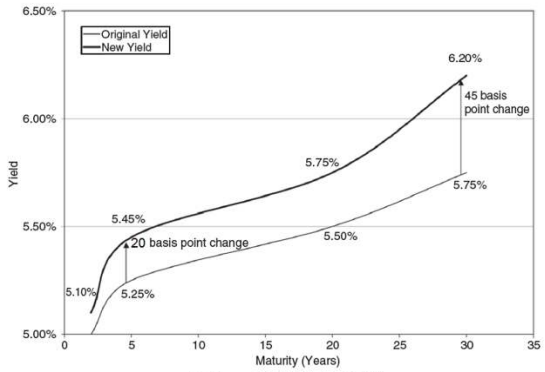
Term structure: interest rates are structured according to maturity.

A yield curve is a graphical deception of a relationship.

- Three examples of yield curve shifts:
  - (a) Parallel shift in the yield curve of 25 basis points
  - (b) and (c) Nonparallel shifts in the yield curve

| | Yield shift Δy (bp) | | | |
|---|---|---|---|---|
| Maturity (years) | | (a) | (b) | (c) |
| 2 | 0 | 25 | 10 | 5 |
| 5 | 0 | 25 | 20 | 15 |
| 20 | 0 | 25 | 25 | 25 |
| 30 | 0 | 25 | 45 | 35 |
| Price (millions) | $65 | $63.24 | $62.49 | $62.90 |

- Conclusion: any measure of interest rate risk that assumes that shifts in interest rates are identical for all maturities is only an approximation



*(b) Nonparallel Shift in the Yield Curve*

**Factors Affecting Yield Curve - Question** (G)

Which of the following would UNLIKELY cause a widening (steepening) in the 2y-10y spread of Treasury securities?

a) Lack of appetite at the recent 10y auction

b) Announcement of Quantitative Easing designed to purchase 10-year securities

c) Large fund manager interest in purchasing 2-year notes

d) All of the above

Assuming the US -10 year yield has been 2.50% over last 12 months and the US 2-year has moved from 1% to 2% is this a flattening or steepening? Flattening

**Question.** Bond xx, a 5-year zero coupon bond.

Bond yy. A 20-year zero coupon bond.

You can buy or sell short both bonds.

Suppose the 5-20 year segment of the yield curve steepens.

Which of the following strategies is most likely to be profitable?

A. Selling bond xx

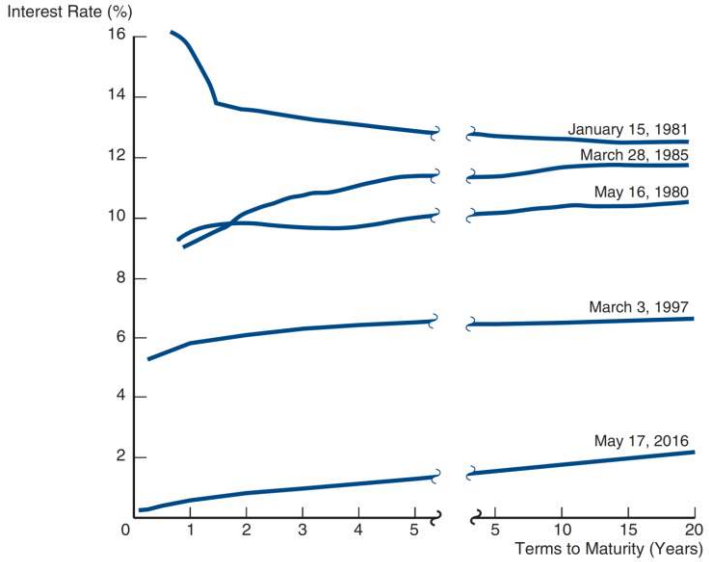
B. Buying bond xx and buying bond yy

C. Buying bond xx and selling bond yy

D. Buying bond yy and selling bond xx

E. Buying bond yy

Case:




- The steep downward curve in 1981 suggested that short-term rates were expected to decline in the near future. This played-out, with rates dropping by 300 bps in 3 months.
- The upward curve in 1985 and 2016 suggested a modest rate increase in the near future.
- The moderately upward slopes in 1980 and 1997 suggest that short term rates were not expected to rise or fall in the near term.
- The upward slope in 2016 suggested short term rates in the future will rise (which they did >2018 4 x 0.25% Fed Funds increases.

a) What can we say about the overall level of interest rates between 1997 and 2016 and name the main cause of this?

- Interest rates have fallen.
- The main cause of this was the 2007-2009 Financial Crisis.

b) What can we say about the shape of the yield curve between 1981 and 1985 ? What has happened to short-term and long-term interest rates?

- Short-term interest rates have fallen sharply. Long-term interest rates are relatively unchanged.

The term structure as a forecasting tool:

- The yield curve does have information about future interest rates, and so it should also help forecast inflation and real output production.
    - Rising (falling) rates are associated with economic booms (recessions)
    - Rates are composed of both real rates and inflation expectations.

Bond yield dependencies:

- Interest rate can be earned from risk free instruments (= “level of interest rates”). State of the economy and actions from the central bank. Level of interest rates will vary according to term structure

- For non-risk free instruments (such as corporate bonds): The perceived risk associated with the issue. Different sectors of the economy will demand different risk premiums above the level of interest rates.
- Short term rates = US central bank – the Federal reserve
- FOMC = Federal Open Markets Committee sets key "Fed funds" rate
- Economic data moves bond markets (non-Farm payroll).

Treasury inflation protected securities (TIPS)

- T-notes and bonds that provide inflation protection
- Inflation index: CPI-U (urban consumer price index)
- Coupon and principal adjusted for inflation every 6 months
- Example:
  - t=0, real coupon rate 3.5% p.a., principal $100000
  - t=6m, inflation 3% p.a.

$$adjusted\ principal\ is: \quad \$100000\times\left(1+\frac{0.03}{2}\right)=\$101500$$

$$coupon\ is: \quad \$101500\times\frac{0.035}{2}=\$1776.25$$

  - t=1y, inflation 2% p.a.

$$adjusted\ principal\ is: \quad \$101500\times\left(1+\frac{0.02}{2}\right)=\$102515$$

$$coupon\ is: \quad \$102515\times\frac{0.035}{2}=\$1794.01$$

Interest rate risk for floating rate securities (FRN)

| Non-FRN | FRN |
|---|---|
| Coupon fixed until maturity | Coupon resets periodically e.g. 3 Month LIBOR + 30 Basis Points |
| Interest Rates ↑↓<br>Bond price ↑↓<br>e.g. 9% 20-year bond price 134.67 | Interest Rates ↑↓<br>Bond price ↑↓<br>But much less volatile<br>**FRNs prices will not stray far from 100/par** e.g. 99.53 /100.75 |

**Week 18: Bonds markets 2**

- Part 1: Bonds intro

*Bonds* are securities that represent debt owed by the issuer to the investor, and typically have specified payments on specific dates.

Purpose of the capital market: original maturity longer than 1 year, typically for long-term financing or investments. Best known capital market securities: Stocks and Bonds.

Participants:

- Primary issuers of securities: Governments (debt); corporations (equity + debt issuers)
- Largest purchasers: individual and institutional investors

Capital market trading:

- Primary market: IPOs
- Secondary market: OTC + organized exchanges

Types of bonds: Government bonds (T-bonds), Corporate bonds, Zero coupon bonds, STRIPS, convertible bonds, floating rate notes, preferred stock.

Bond is an IOU – issued by an entity that guarantees payment of original loan plus interest on a specific maturity date. The amount of interest is also known as a coupon.

- Issuers:
  - Central government (e.g. US government)
  - Government agency (e.g. Fannie Mae, Freddie Mac)
  - Municipal government (e.g. City of Detroit)
  - Corporate High Grade (e.g. Coca-cola)
  - Corporate 'Junk' Bonds e.g. energy companies
  - Supranationals (e.g. World Bank,EIB)
  - Emerging Markets e.g. Turkey,Cemex
  - Covered Bonds (e.g. Danish Mortgage Bonds)
  - Mortgage & Asset Backed Securities

Categories of fixed income securities

1) Debt obligations: Borrowers pays amounts to lender (creditor). Interest and principal
2) Preferred stock:
   a. Called a 'stock' but characteristics more like a bond.
   b. Fixed coupon (unlike equity dividends)
   c. Investors buy for income considerations not capital appreciation.
   d. Ownership interest in a corporation
   e. Priority over common stockholders
   f. Credit Ranking: Senior Bondholders/ *Junior Bondholders/ Preferred Stock/ Stock
   g. Originally a US phenomenon but now developed in European Markets

Price per % of par value:

- Dollar price of a bond with quoted price 113 11/32 and par or nominal value $100,000 is

$$\frac{113+\frac{11}{32}}{100}\times\$100000=\$113343.75$$

Discount: below par value

Premium: above par value

Coupon rate: interest rate the issuer agrees to pay. In Europe the coupon is typically paid annually, while in the US is paid semi-annually.

Why can a bond trade at 83 or 113 if they finally pay 100$?

The price of Bond A will fall as investors sell.

It will fall to a point whereby it equals the rate of return of Bond B (5% a year).

Suppose when the bond is issued yields (rates of return) in the market for 10-year bonds are 3% (assume USTs).

Our new bond (Bond A) gets issued with a 3% coupon rate and 100 issue price i.e so in line with market yields and investors buy accordingly. The bond then trades in the secondary market at around 100.

Suppose generally interest rates (and 10-year yields rise to 5%) and new 10-year bonds (Bond B) are issued at 100 with 5% coupon.

Who on earth would buy our Bond A with only a 3% coupon at 100 – in fact investors will sell this bond and buy Bond B paying a 5% coupon.

If Bond A pays a 3% coupon each year, how can it pay an annualised return of 5% each year?

By falling in price so that the coupon/interest rate plus capital appreciation equals an annual return of 5%.

That price is approximately 84.5

i.e. We buy 10,000 face value. Price 84.5 (%). Cost 10,000 x 84.5% =$8,450

Redeems at 100 ($10,000) at maturity

Capital gain $1,550 PLUS Annual Interest Rate 3%

= 5% Annual Rate of Return over 10-years

Bond A 10-year maturity - 3% coupon.

10-year UST yields fall to 1.50%

New 10-year bond issued in line with market yields with coupon of 1.50%

Bond C.

Everyone wants to buy Bond A with a 3% yield so its price is driven up to its return equals 1.5% annualised for 10-years = 113.80

*Example*

You buy $10,000 nominal (you will get back $10,000 at maturity)

Market price is 113.80 – Cost 10,000 x 113.80 % =$11,380

Yield to Maturity / Annualised Rate of Return =

Paid $11,380 . Redeems at $10,000 = Loss $1,380

Annual coupon of 3% ($300)

= YTM/Rate of Return of 1.5% same as Bond C

Finding the value of coupon bonds: it is no different than any other cash flow. Once the cash flows have been identified they have to be discounted to time zero. Formula en la hoja

Interest rate risk:

r> c -> Po < Par (Discount)

r=c -> Po = Par (Par)

r<c -> Po > Par (Premium)

Current yield: The coupon interest payment divided by the current market price of the bond.

Indenture/Prospectus: The contract that accompanies a bond and specifies the terms of the loan agreement. It includes management restrictions, called covenants.

Market rate/Yield: The interest rate currently in effect in the market for securities of similar risk and maturity. The market rate is used to value bonds.

Yield to maturity: The yield an investor will earn if the bond is purchased at the current market price and held until maturity.

- Part 2: Bonds instruments a)

Zero coupon bonds: pay no coupons. All interest gained at maturity; therefore, they are discounted.

Floating rate notes (Variable-rate securities, floater, FRN) Coupon rate resets periodically (on reset days, according to some reference rate). Coupon rate = reference rate + quoted margin

*Example:*

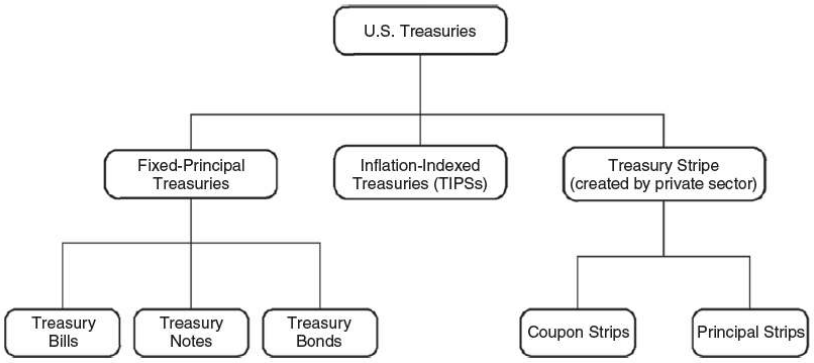
- reference rate = 1-month LIBOR = 2% (The importance of LIBOR!)
- quoted margin = 100 basis points = 1%
- coupon rate = 3%

Interest rate risk for floating rate securities:

| Non-FRN (Straight) | FRN |
|---|---|
| Coupon fixed until maturity | Coupon resets periodically e.g. 3 Month LIBOR + 30 Basis Points |
| Interest Rates ↑↓<br>Bond price ↑↓<br>e.g. 9% 20-year bond price 134.67 | Interest Rates ↑↓<br>Bond price ↑↓<br>But much less volatile<br>**FRNs prices will not stray far from 100/par** e.g. 99.53 /100.75 |

| Type | Maturity |
|---|---|
| Treasury bill | Less than 1 year |
| Treasury note | 1 to 10 years |
| Treasury bond | 10 to 30 years |

EXHIBIT 2 Overview of U.S. Treasury Debt Instruments




Treasury bonds innovation:

- Treasury inflation-indexed securities (TIPS): principal amount is tied to the current rate of inflation to protect investor purchasing power
- STRIPS: the coupon and principal payments are “stripped” from a T-bond and sold as individual zero- coupon bonds.

**What is meant by Treasury Strips and what prevents arbitrage with normal Treasury securities?**

Each Treasury security has a series of separate cashflows via semi-annual coupon payments and a principal repayment.

A US Treasury dealer may purchase a Treasury security and via a separate legal entity issue a series of zero coupon bonds against these individual cashflows creating a series of Treasury strips.

The dealer will profit from the price paid for the Treasury security and the higher prices that the Strips are sold to investors.

The opposite process called ‘reconstitution’ where individual Strips are bought and repackaged into a Treasury security prevents the value of Strips straying far from ‘fair value’.

**Treasury Inflation-Protected Securities (TIPS)**

- T-notes and bonds that provide inflation protection
- Inflation index: CPI-U (urban consumer price index)
- Coupon and principal adjusted for inflation every 6 months
- Example:
  - t=0, real coupon rate 3.5% p.a., principal $100000
  - t=6m, inflation 3% p.a.

$$adjusted\ principal\ is: \quad \$100000 \times \left(1 + \frac{0.03}{2}\right) = \$101500$$

$$coupon\ is: \quad \$101500 \times \frac{0.035}{2} = \$1776.25$$

  - t=1y, inflation 2% p.a.

$$adjusted\ principal\ is: \quad \$101500 \times \left(1 + \frac{0.02}{2}\right) = \$102515$$

$$coupon\ is: \quad \$102515 \times \frac{0.035}{2} = \$1794.01$$

Treasury bonds: Agency debt: not technically Treasury securities, agency bonds are issued by government-sponsored entities (Freddie Mac). “implicit” guarantee that the U.S. government will not let the debt default. This “guarantee” was clear during the 2008 bailout.

- Part 3: Bonds instruments b)

A bond is either credit trader or interest rate trader – corporate bonds are credit.

Characteristics:

- Typical face value: 1000$, paid semi-annually in the US and Europe.
- Cannot be redeemed anytime the issuer wishes unless a specific clause states it (call option).
- Degree of risk varies with each bond, even from the same issuer. Accordingly, the required interest rate /yield varies with level of risk. The degree of risk ranges from low risk (AAA) to higher risk (BBB). Any bonds rated below BBB are considered sub-investment grade debt (or 'Junk' or 'High Yield').
- Call Provisions: If the issuer has the right to redeem bond early investors require a higher yield.
    - Bond A) IBM 3% 2030 Yield-to-Maturity 2.70%
    - Bond B) IBM 3% 2030 – Callable at 100 in 2022
    - Yield-to-Maturity 2.78%
- Convertible bonds: some bonds have the right to be converted to equity.
    - e.g., General Electric 3% 2030 with a conversion feature. Each bond is convertible into 10 shares of General Electric common stock at $30 per share. *Very interesting if GE shares move up to $35 per share. Not so interesting if GE shares fall to $10 per share.*
    - If the price of the underlying security/equity goes up, 'all other things being equal' the price of the convertible bond will also increase. As a result, conversion is an attractive feature to bond holders. As a result, the yield on a convertible bond is lower than a non-convertible bond.

*How do they relate to corporate bond risk premium, yield and overall risk?*

In investment, a corporate bond rating represents the creditworthiness of the corporate bond. **1 mark**

The ratings are published by credit rating agencies and used by investment professionals to assess the likelihood the debt will be repaid. **1 mark**

Generally, the lower the corporate bond rating, the higher the likelihood of default and thus, the higher the bond's yield. **1 mark**

Risk premium is defined as the return in excess of the risk-free rate of return that an investment is expected to yield. **1mark**

An asset's risk premium is a form of compensation for investors to tolerate the extra risk compared to that of a risk-free investment. **1 mark**

Lower corporate bond ratings mean that the yield of the corporate bonds will be higher and causes the risk premium to increase. **1 mark**

- Secured bonds: Mortgage bonds.
- Unsecured bonds:
    - Senior debt
    - Junior/subordinated debt
    - Preferred stock

Credit risk – downgrade risks: Creditworthiness is the issuer financial ability to make interest payments and repay the loan in full at maturity. Rating agencies may lower the credit of a bond, place a bond on "credit watch" status.

Credit agencies conflict of interest:

- March 2020 saw the fastest rate of downgrades going back to 2002
- Where ratings too high before the 2020 crisis …just like 2008?
- This stems from the business model of the agencies, which are paid by the companies and governments whose creditworthiness they assess …compare Big 4 Auditors!!
- A rating from a top agency usually makes the sale of a bond or loan much easier
- Fund managers often can only buy rated bonds and therefore have to sell bonds if they fall below certain thresholds…making the cost of financing dearer for corporates if they lose their investment grade rating!
- Issuers pay to be rated!! –a structure that can cause conflicts of interest!
- Leading to accusations that agencies compete to win business by offering high ratings!
- In 2015, S&P agreed to pay the US and states about $1.4 billion to settle allegations that it boosted mortgage-backed securities in the run-up to the crisis for fear of losing market share.
- Moody's paid $864 Million
- The pair account for 81% of credit ratings

Corporate bonds - electronic trading:

*Trading of bonds electronic or via ECN (Electronic Trading Network) is most suited to Government Bonds rather than Corporates for liquidity concerns.*

- *And generally more so for stocks than bonds given 41,000 stocks in the world and millions of bonds with unique characteristics*
- *Of those millions of Corp Bonds many 'trade by appointment' if at all*
- *Of the 21,175 corporate bonds outstanding in the US in 2018, only 246 traded at least once a da and a sixth did not trade at all*
- *Things shifted after 2008 Financial Crisis - proprietary trading desks shut down, bond inventory most costly to carry – not helping corporate bond liquidity and e-trading*
- *BUT Covid-19 has accelerated the trend to Corporate Bond trading online*
- *MarketAxess –average daily corporate bond trading climbed 29% to more than $10 BN in 2020 – doubling since 2017*
- *Tradeweb's average daily credit trading volumes trebled in 2020*
- *Electronic trading accounted for 38% and 26% of overall US investment grade and junk bond trading in December 2020*

Numbers not assessed

- *Asset Managers predict 40% of their corporate bond trading would be electronic in 2022*
- *Almost half of government bond trading is electronic and this is expected to grow to two/thirds by 2022*

- *There are limits to how far this can go – the differences between bonds and common stock are real*
- *Think of the bond market as a strip of night clubs –where popular hotspots can afford to invest in cutting-edge sound systems and laser shows.This may attract some new punters to the neighboourhood but dooms the less fashionable ones*
- *In other words 'liquidity attracts liquidity'*
- *The most active corners of the (corporate) bond market will become increasingly electronified leaving a long tail of poorly a rarely traded debt*
- *However if you're a bond salesman or trader who thinks Python is a snake then your days may be numbered!*

Numbers not assessed

- Part 4: Bond overview (no hay contenido)
- Part 5 – Accrued interest and duration.

Accrued interest: coupon payments are made annually or semi-annually. If a seller sells the bond on July 1st, he will not get the payment of the coupon even though he had earned half of the coupon. The buyer must pay the accrued interest due to the seller when he buys the bond (on July 1st), which he recovers on the coupon date.

Using a Eurobond 360 day year and 2.75% annual coupon.

Coupon payment date July 1st and 100,000 nominal

Settlement Date of the bond 15th October

Bond has 105 days accrued (30+30+30+15)

AI = 105/360 X 0.0275 X 100,000 = $802.08

If the price of the bond is 100 (i.e.100%) the purchaser will pay 100% of 100,000 plus $802.08 accrued interest.
Bond Price is 100. The Settlement Amount is $100,802.08

Duration:

Two bonds

1) *IBM 1% 2040 – Price 78 -Yield To Maturity 4%*
2) *IBM 6% 2040 – Price 128 -Yield To Maturity 4%*

*They are both 20-year bonds – do they have the same interest risk?*

*Is maturity a good measure of exposure to interest rate risk ?*

*No*

*1) IBM 1% 2040 receives the majority of its cash flows near maturity*

*2) IBM 6% 2040 receives significant cash flows much earlier so is less exposed to interest rate risk.*

Maturity = 20 years

Duration is <19 years for both bonds.

Duration of 2) is much less than 1) and is therefore less sensitive to interest rate risk i.e., Duration 1) may be 17 years, Duration 2) may be 11.

What is the duration of a Zero-Coupon Bond with 17.2 years to maturity?

All the cash payments are on maturity.

Answer : Duration is 17.2 years