Collateralized Debt obligations (CDO)
and
Credit Default Swaps (CDS)

Collateralized Debt Obligation

- CDOs, or collateralized debt obligations, are financial tools that banks use to repackage individual loans into a product sold to investors on the secondary market.
- These packages consist of auto loans, credit card debt, mortgages or corporate debt. They are called collateralized because the promised repayments of the loans are the collateral that gives the CDOs their value.
- CDOs are a particular kind of derivative. As its name implies, a derivative is any financial product that derives its value from another underlying asset.
- CDOs are called asset-backed commercial paper if the package consists of corporate debt. Banks call them mortgage-backed securities if the loans are mortgages. If the mortgages are made to those with a less than prime credit history, they are called subprime mortgages.

Banks sold CDOs to investors for three reasons:

- The funds they received gave them more cash to make new loans.
- It moved the loan's risk of default from the bank to the investors.
- CDOs gave banks new and more profitable products to sell. That boosted share prices and managers' bonuses.

Advantages of CDOs

- They provided more liquidity in the economy. CDOs allowed banks and corporations to sell off their debt. That freed up more capital to invest or loan. The spread of CDOs is one reason why the U.S. economy was robust until 2007.
- The invention of CDOs also helped create new jobs. Unlike a mortgage on a house, a CDO is not a product that you can touch or see to find out its value. Instead, a computer model creates it. Thousands of college and higher-level graduates went to work in Wall Street banks as "quant jocks.” Their job was to write computer programs that would model the value of the bundle of loans that made up a CDO. Thousands of salespeople were also hired to find investors for these new products.
- As competition for new and improved CDOs grew, these quant jocks made more complicated computer models. They broke the loans down into "tranches," which are simply bundles of loan components with similar interest rates.
- Here's how that works. Adjustable-rate mortgages offered "teaser" low-interest rates for the first three to five years. Higher rates kicked in after that. Borrowers took the loans, knowing they could only afford to pay the low rates. They expected to sell the house before the higher rates were triggered.
- The quant jocks designed CDO tranches to take advantage of these different rates. One tranche held only the low-interest portion of mortgages. Another tranche offered just the part with the higher rates. That way, conservative investors could take the low-risk, low-interest tranche, while aggressive investors could take the higher-risk, higher-interest tranche. All went well as long as housing prices and the economy continued to grow.

Disadvantages of CDOs

- Unfortunately, the extra liquidity created an asset bubble in housing, credit cards, and auto debt. Housing prices skyrocketed beyond their actual value. People bought homes so they could sell them. The easy availability of debt meant people used their credit cards too much. That drove credit card debt to almost $1 trillion in 2008.
- The banks that sold the CDOs didn't worry about people defaulting on their debt. They had sold the loans to other investors, who now owned them. That made them less disciplined in adhering to strict lending standards. Banks made loans to borrowers who weren't credit-worthy. That ensured disaster.
- What made things even worse was that CDOs became too complicated. The buyers didn't know the value of what they were buying. They relied on their trust of the bank selling the CDO. They didn't do enough research to be sure the package was worth the price. The research wouldn't have done much good because even the banks didn't know. The computer models based the CDOs' value on the assumption that housing prices would continue to go up. If they fell, the computers couldn't price the product.

How do CDOs Work?

- Initially, all the cash flows from a CDO's collection of assets are pooled together. This pool of payments is separated into rated tranches. Each tranche also has a perceived (or stated) debt rating to it.
- The highest end of the credit spectrum is usually the 'AAA' rated senior tranche. The middle tranches are generally referred to as mezzanine tranches and generally carry 'AA' to 'BB' ratings and the lowest junk or unrated tranches are called the equity tranches. Each specific rating determines how much principal and interest each tranche receives.
- The 'AAA'-rated senior tranche is generally the first to absorb cash flows and the last to absorb mortgage defaults or missed payments. As such, it has the most predictable cash flow and is usually deemed to carry the lowest risk. On the other hand, the lowest rated tranches usually only receive principal and interest payments after all other tranches are paid.
- Furthermore they are also first in line to absorb defaults and late payments. Depending on how spread out the entire CDO structure is and depending on what the loan composition is, the equity tranche can generally become the "toxic waste" portion of the issue.

Who buys CDOs?

- Generally speaking, it is rare for public to directly own a CDO.
- Insurance companies, banks, pension funds, investment managers, investment banks and hedge funds are the typical buyers.
- These institutions look to outperform Treasury yields, and will take what they hope is appropriate risk to outperform Treasury returns.
- Added risk yields higher returns when the payment environment is normal and when the economy is normal or strong.
- When things slow or when defaults rise, the flip side is obvious and greater losses occur.

CDOs and Financial crisis

- Collateralized debt obligations (CDOs) are a type of structured credit product in the world of asset-backed securities. The purpose of these products is to create tiered cash flows from mortgages and other debt obligations that ultimately make the entire cost of lending cheaper for the aggregate economy.
- This happens when the original money lenders give out loans based on less stringent loan requirements. The idea is that if they can break up the pool of debt repayments into streams of investments with different cash flows, there will be a larger group of investors who will be willing to buy in.
- CDOs do not solely involve mortgage cash flows. The underlying cash flows in these structures can be comprised of credit receivables, corporate bonds, lines of credit, and almost any debt and instruments.
- For example, CDOs are similar to the term "subprime", which generally pertains to mortgages, although there are many equivalents in auto loans, credit lines and credit card receivables that are higher risk.
- For example, by splitting a pool of bonds or any variation of different loans and credit-based assets that mature in 10 years into multiple classes of securities that mature in one, three, five and 10 years, more investors with different investment horizons will be interested in investing.

CDOs and Financial crisis

- This opaqueness and the complexity of CDOs created a market panic in 2007. Banks realized they couldn't price the product or the assets they were still holding. Overnight, the market for CDOs disappeared.
- Banks refused to lend each other money because they didn't want more CDOs on their balance sheet in return. It was like a financial game of musical chairs when the music stopped. This panic caused the 2007 banking crisis.
- The first CDOs to go south were the mortgage-backed securities. When housing prices started to drop in 2006, the mortgages of homes bought in 2005 were soon upside-down. That created the subprime mortgage crisis.
- The Federal Reserve assured investors it was confined to housing. In fact, some welcomed it and said that housing had been in a bubble and needed to cool down.
- What they didn't realize was how derivatives multiplied the effect of any bubble and any subsequent downturn. Not only banks were left holding the bag, but they were also holding the pension funds, mutual funds, and corporations.
- It was until the Fed and the Treasury started buying these CDOs that a semblance of functioning returned to the financial markets.

Asset composition complications

- To make matters a bit more complicated, CDOs can be made up of a collection of prime loans, near prime loans risky subprime loans or some combination of the above.
- These are terms that usually pertain to the mortgage structures.
- This is because mortgage structures and derivatives related to mortgages have been the most common form of underlying cash flow and assets behind CDOs.
- If a buyer of a CDO thinks the underlying credit risk is investment grade and the firm is willing to settle for only a slightly higher yield than a Treasury, the issuer would be under more scrutiny if it turns out that the underlying credit is much riskier than the yield would dictate.
- This surfaced as one of the hidden risks in more complicated CDO structures.
- The most simple explanation behind this, regardless of a CDO's structure in mortgage, credit card, auto loans, or even corporate debt, would surround the fact that loans have been made and credit has been extended to borrowers that weren't as prime as the lenders thought.

Other Complications

- Other than asset composition, other factors can cause CDOs to be more complicated. For starters, some structures use leverage and credit derivatives that can trick even the senior tranche out of being deemed safe.
- These structures can become synthetic CDOs that are backed merely by derivatives and credit default swaps made between lenders and in the derivative markets.
- Many CDOs get structured such that the underlying collateral is cash flows from other CDOs, and these become leveraged structures.
- This increases the level of risk because the analysis of the underlying collateral (the loans) may not yield anything other than basic information found in the prospectus.
- Care must be taken regarding how these CDOs are structured, because if enough debt defaults or debts are prepaid too quickly, the payment structure on the prospective cash flows will not hold and the some tranche holders will not receive their designated cash flows.
- Adding leverage to the equation will magnify any and all effects if an incorrect assumption is made.
- The simplest CDO is a 'single structure CDO'. These pose less risk because they are usually based solely on one group of underlying loans.
- It makes the analysis straightforward because it is easy to determine what the cash flows and defaults look like.

Credit Default Swaps

- CDS are a financial instrument for swapping the risk of debt default. Credit default swaps may be used for emerging market bonds, mortgage-backed securities, corporate bonds and local government bond
- The buyer of a credit default swap pays a premium for effectively insuring against a debt default. He receives a lump sum payment if the debt instrument defaults.
- The seller of a credit default swap receives monthly payments from the buyer. If the debt instrument defaults they have to pay the agreed amount to the buyer of the credit default swap.

Example-1-CDS

- An investment trust owns £1 million corporate bond issued by a private housing firm.
- If there is a risk the private housing firm may default on repayments, the investment trust may buy a CDS from a hedge fund. The CDS is worth £1 million.
- The investment trust will pay interest on this credit default swap of say 3%. This could involve payments of £30,000 a year for the duration of the contract.
- If the private housing firm doesn't default. The hedge fund gains the interest from the investment bank and pays nothing out. It is simple profit.
- If the private housing firm does default, then the hedge fund has to pay compensation to the investment bank of £1 million – the value of the credit default swap.
- Therefore the hedge fund takes on a larger risk and could end up paying £1million
- The higher the perceived risk of the bond, the higher the interest rate the hedge fund will require.

Example-2-CDS

- Example, suppose that Lloyds TSB has lent money to riskymortgage.co.uk in the form of a £1,000 bond.
- Lloyds TSB may then purchase a credit default swap from another company e.g. a Hedge Fund.
- If the firm (Riskymortgage.co.uk) default on the loan, then the hedge fund will pay Lloyds TSB the value of the loan.
- Thus Lloyds TSB has insurance against loan default. The hedge fund has the opportunity to make a profit, so long as the firm does not default on the loan.
- The riskier the loan, the higher will be the premium required on buying a credit default swap.

Why would people buy CDS?

Hedge against risk.

- Suppose an investment fund owned mortgage bonds from riskymortgage.co.uk. It might be worried about losing all its investment. Therefore, to hedge against the risk of default, they could purchase a credit default swap from Lloyds TSB. If riskymortgage.co.uk defaulted, they will lose their investment, but receive a pay-off from Lloyds to compensate. If they don't default, they have paid a premium to Lloyds but have had security.

Speculation e.g. risk is underpriced.

- Suppose a hedge fund felt risky mortgage was very likely to default because of a rise in home repossessions. They would buy a credit default swap. If the debt defaulted, then they would make a profit from Lloyds TSB. Note you don't have to actually own debt to take a credit default swap.
- The riskier a bond is the higher premium will be required from a buyer of a credit default swap. It is argued that credit default swaps provide an important role in indicating the riskiness/creditworthiness of a firm.

Arbitrage

- If a company's financial position improves, the credit rating should also improve and therefore, the CDS spread should fall to reflect improved rating. This makes CDS more attractive to sell CDS protection. If the company position deteriorated, CDS protection would be more attractive to buy. Arbitrage could occur when dealers exploit any slowness of the market to respond to signals.

Credit default Swaps in Markets

- The first credit default swap was introduced in 1995 by JP Morgan. By 2007, their total value has increased to an estimated $45 trillion to $62 trillion. Although since only 0.2% of investment companies default, the cash flow is much lower than this actual amount.
- The size of the credit default market dwarfs that of the stock market and the bond market they represent. Therefore, this shows that credit default swaps are being used for speculation and not insuring against actual bonds.
- Credit Default Swaps are unregulated and because they get traded so frequently there is an uncertainty of who owns them and whether the holders can actually pay in the event of a negative credit event.

Pros and Cons of CDS

Pros

- Swaps protect lenders against credit risk. That enables bond buyers to fund riskier ventures than they might otherwise. Investments in risky ventures spur innovation and creativity, which boost economic growth. This is how Silicon Valley became America's innovative advantage.
- Companies that sell swaps protect themselves with diversification. If a company or even an entire industry defaults, they have the fees from other successful swaps to make up the difference. If done this way, swaps provide a steady stream of payments with little downside risk.

Cons

- Swaps were unregulated until 2009. That meant there was no government agency to make sure the seller of the swap had the money to pay the holder if the bond defaulted. In fact, most financial institutions that sold swaps were undercapitalized. They only held a small percentage of what they needed to pay the insurance. The system worked until the debtors defaulted.
- Unfortunately, the swaps gave a false sense of security to bond purchasers. They bought riskier and riskier debt. They thought the CDS protected them from any losses.

How Swaps Caused the 2008 Financial Crisis?

- By mid-2007, there was more than $45 trillion invested in swaps.
- That was more than the money invested in the U.S. stocks, mortgages, and U.S. Treasurys combined.
- The U.S. stock market held $22 trillion. Mortgages were worth $7.1 trillion, and U.S. Treasurys were worth $4.4 trillion.
- In fact, it was almost as much as the $65 trillion produced by the entire world.

CDS on Lehman Brothers debt helped cause the 2008 financial crisis?

- Lehman Brothers owed $600 billion in debt. Of that, $400 billion was "covered" by credit default swaps.
- That debt was only worth 8.62 cents on the dollar. The companies that sold the swaps were American International Group, Pacific Investment Management Company, and the Citadel hedge fund.
- They didn't expect all the debt to come due at once. When Lehman declared bankruptcy, AIG didn't have enough cash on hand to cover swap contracts. The Federal Reserve had to bail it out.
- Even worse, banks used swaps to insure complicated financial products. They traded swaps in unregulated markets. The buyers had no relationships to the underlying assets. They didn't understand their risks. When they defaulted, swap sellers like Municipal Bond Insurance Association, Ambac Financial Group Inc., and Swiss Reinsurance Co. were hit hard.
- Overnight, the CDS market fell apart. No one bought them because they realized the insurance wasn't able to cover large or widespread defaults. They accumulated capital and made fewer loans. That cut off funding for small businesses and mortgages. These were both large factors that kept unemployment at record levels.

Dodd-Frank

- In 2009, the Dodd-Frank Wall Street Reform Act regulated credit default swaps in three ways.
- First, the Volcker Rule prohibited banks from using customer deposits to invest in derivatives, including swaps.
- Second, it required the Commodity Futures Trading Commission to regulate swaps.
- It specifically required a clearinghouse be set up to trade and price them.
- Third, it phased out the riskiest CDS.
- Many banks shifted their swaps overseas to avoid U.S. regulation. Although all G-20 countries agreed to regulate them, many were behind the United States in finalizing the rules. But that changed in October 2011.
- The European Economic Area regulated swaps with the MiFID II.

The JP Morgan Chase Swap Loss

- On May 10, 2012, JP Morgan Chase CEO Jamie Dimon announced the bank lost $2 billion betting on the strength of credit default swaps. By 2014, the trade had cost $6 billion.
- The bank's London desk executed a series of complicated trades that would profit if corporate bond indexes rose.
- One, the Markit CDX NA IG Series 9 maturing in 2017, was a portfolio of credit default swaps.
- That index tracked the credit quality of 121 high-quality bond issuers, including Kraft Foods and Walmart.
- When the trade started losing money, many other traders began taking the opposite position.
- They hoped to profit from JPMorgan's loss, thus compounding it.
- The loss was ironic. JP Morgan Chase first introduced credit default swaps in 1994. It wanted to insure itself from the risk of default on the loans it held on its books.

The Greek Debt Crisis and CDS

- Swaps' false sense of security contributed to the Greek debt crisis.
- Investors bought Greek sovereign debt, even though the country's debt-to-gross domestic product ratio was higher than the European Union's 3 percent limit.
- The investors also bought CDS to protect them from the potential of default.
- In 2012, these investors found out just how little the swaps protected them. Greece required the bondholders to take a 75 percent loss on their holdings. The CDS did not protect them from this loss.
- That should have destroyed the CDS market. It set a precedent that borrowers, like Greece, could intentionally circumvent the CDS payout.
- The International Swaps and Derivatives Association ruled that the CDS must be paid, regardless.

Thank You