Week 7

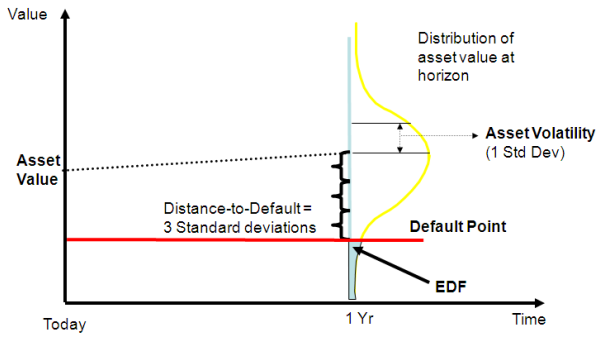
Alternative Estimation of Credit Quality (Chapter 7)

Market-Based Credit Measures:

- Merton and Black-Scholes research provided the basic concepts
- The basic proposition is that when the market value of a firm's assets drops below a certain level, it will default
- KMV (now Moody's Analytics) developed a user-friendly product called EDF™ - Expected Default Frequency – which was dominant in the early 90s
- The main advantage is that the default probability is calculated regularly, monthly in the past and now daily by using Black-Scholes option pricing theory

Overview of Methodology:

- Merton (1974): equity is a call option on a firm's assets with the strike price equal to the amount of liabilities
- Market value of equity, its volatility and the book value of liabilities are observable
- Using Black-Scholes option pricing formula, Moody's Analytics deducts the market value of assets and its volatility for a given time horizon
- According to the Moody's Analytics EDF™ model, a firm defaults when the market value of its assets falls below its liabilities
- Distance to default (DD): gap, adjusted for volatility, between the market value of assets and book value of liabilities:



- Moody's Analytics empirical research translate DD into a default probability (EDF)

EDF™'s Advantages:

- Creates a link between the equity and credit markets
- Provides daily default probabilities, taking into account the latest news
- Forward-looking view of default frequencies – the main driver of the EDFs is the market value of equity, which aggregates the entire market's view on the company's bal. sheet

Black Scholes assumptions (five key variables for option valuing):

1. The value of the underlying asset e.g. market value of the firm's total assets
2. The volatility of the market value of total assets
3. The option strike price e.g. the outstanding value of the debt
4. Time to expiration on the option (the debt maturity)
5. The risk-free interest rate

Rite Aids EDF™:

- Rite Aid's EDF™ is shown falling in late 2011 before bottoming out in March 2012 and rising from there to about 5% in September 2012
- S&P's rating remained unchanged and Moody's revised its rating downwards from CAA3 to CAA2 over the period

EDF™'s Shortcomings:

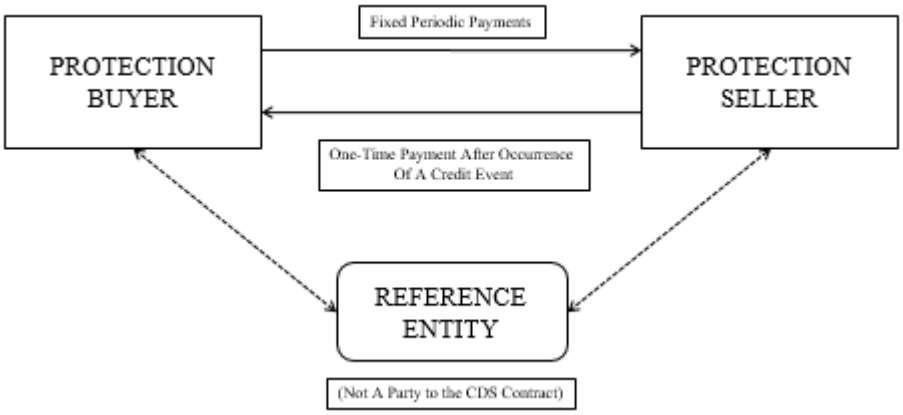
- Somewhat of a black box
- Can lead to volatile results if equity price is volatile
- The model uses the book value of liabilities, which is not updated regularly, especially in most European and Asian countries
- EDF™'s became less relevant for the largest corporates with the development of CDS and price discoverability

Drivers of Rite Aid's EDF™:

- Drivers include Rite Aid's asset volatility, historical equity volatility, and instantaneous equity volatility.
- Instantaneous equity volatility is calculated as the asset volatility multiplied by the leverage and divided by the hedge ratio of equity to assets

Credit Default Swap Prices:

- It is a legal contract which transfers the credit risk of a reference entity (e.g. corporate, sovereign, asset-backed securities) from one party (protection buyer) to another party (protection seller)



- Approximately 1,000 companies are actively traded, with a handful sovereign entities
- The higher the price, the higher the perceived default risk
- More transparency than in the past with prices available on Bloomberg
- Similar information can also be obtained from bond pricing but:
    - Even less liquidity than the CDS market
    - No transparency prices available
    - Need to adjust prices for embedded interest rate risk, funding costs and sometimes illiquidity
    - CDS prices may be influenced by non-credit events

Pros of CDS Prices:	*Cons of CDS Prices:*
- Just like EDF™'s, CDS prices are updated on real time basis and benefit from the latest news	- Not a deep market - Very limited liquidity - Other factors than pure credit risk influence the market - Before the crisis, there was a lot of capital available so investors sometimes accepted low return in order to use their capital. CDS prices may not have reflected the real credit risk: picture below - During the crisis, many bond holders needed to cover their credit risk and some protection sellers disappeared, which may have put upward pressure on CDS prices

Source: Fitch CDS Pricing Service Data

Why do Banks and other Institutions have CRM teams?

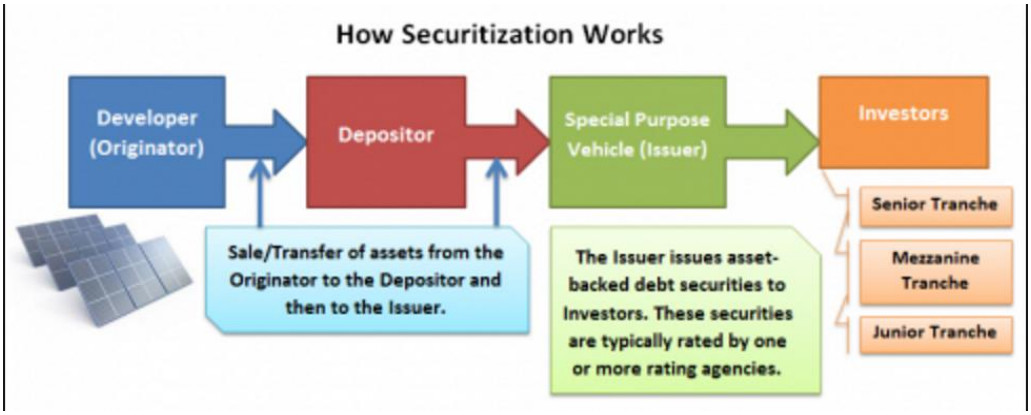
If you join a CRM team of a bank, you will perform fundamental credit analysis to start with. Different sources can lead to different results, so make the best use of various available sources and apply the best judgement. Furthermore:

- Most financial institutions' large borrowers are rated by external rating agencies but your transaction may not be plain vanilla credit exposure
- You may have a portfolio with many non-rated names
- You may disagree and have better knowledge than anybody else

Securitisation (Chapter 8)

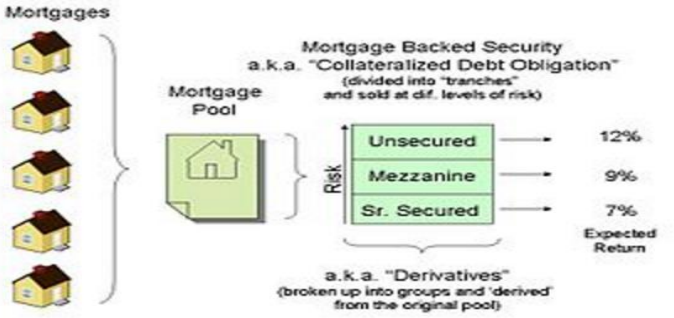
What is securitisation?

It means acquisition of financial assets by any Securitisation Company or Reconstruction Company from an originator, whether by raising of funds by such Securitisation Company or Reconstruction Company from qualified institutional buyers by issue of security receipts representing undivided interest in such financial assets or otherwise.



Securitisation Key Concepts:

- Securitisation refers to the creation of fixed-income securities (Asset-Backed Securities (ABS)) backed by cash flows generated by a discrete pool of assets



- Securitisation is a way to transfer the credit risk of assets to capital markets investors and to provide financing for these assets
- Securitisation became popular in the 80s under impulsion of investment banks. They realised that they could generate higher return on equity by fee-based structuring/distribution activities rather than keeping the risk on their balance sheet
- Securitised products have become a basic investment product for money managers

Building Blocks of a Securitisation:

Collateral: Static/Revolving

- Assets are generated by banks, intermediaries or corporates
- They are sold, on a non-recourse basis, to a Special Purpose Vehicle (SPV)
- The main benefit for intermediaries is that typically the cost of funding the assets is cheaper than if they are funded by their own liabilities (on-balance sheet)

Issuer

- The SPV purchases the assets and all the attached rights
- Funding comes from the issuance of securities in the capital markets

Major Asset Classes:

- *Residential* (RMBS – Residential mortgage backed securities, HELOC – Home equity line of credit
- *Commercial* (CMBS – Commercial mortgages)
- *Consumer finance* (auto loans, credit cards, student loans)
- *Operating assets* e.g. equipment/aircraft leases
- *Future revenues of commodities' production* (future flows): supporting assets do not exist when the transaction closes but will be produced over time
- *Exotic products:* The bowie bonds e.g. future royalties generated by David Bowie's music and revenues generated by pubs in the U.K. (Whole-business securitisation)

Securities - Securities are sold to institutional investors - There are typically several tranches with various levels of subordination and ratings - Investors receive regular interest payments - Principal is paid back as assets amortise. Principal can also be reinvested in new assets	

Credit Risk:

Credit risk exists for the structuring bank during the "warehousing period":

- Assets are often purchased over time by the bank and sold to the SPV when the expected deal size is reached
- If their credit quality deteriorates, assets may become unsellable to the SPV, stay on the bank's balance sheet or be sold at a discount

Investors buying the securities take a credit risk until the principal has been fully repaid or the securities sold