Introduction to
Fixed Income & Credit

Asset Management

Fixed Income explanation

- The Basis of Fixed Income is the need to purchase today with not enough cash available: ie. Mortgage or consumer loan
- You borrow money from your banker until the end of the month when your wage is available
- You borrow money from Shylock to finance your boats on missions of commerce
- You borrow money to purchase a house

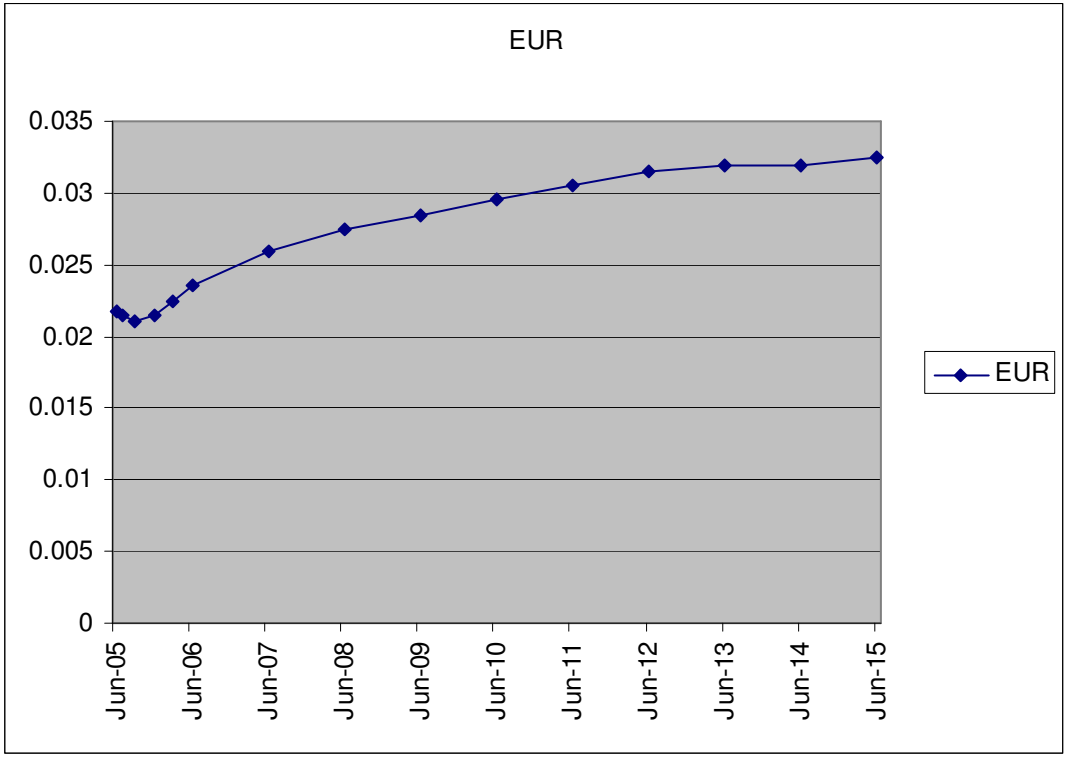
CAP
Capital Advisory Partners
Alternative Investments

Fixed Income explanation

- There is an opportunity cost to not have the money available for the lender (he can't buy bread)
- There are different time periods over which money can be lent
- There is a value associated with each time period of lending, logically lending for longer periods is more of a burden and therefore a "normal yield curve" will be positively sloped

CAP
Capital Advisory Partners
Alternative Investments

Normal, positive yield curve today



CAP
Capital Advisory Partners
Alternative Investments

Yield curve construction

- The value of one yield curve may give an indication of how the Health of the Country's economy is perceived.
- In high inflation, the Central bank will raise Short term rates (the only ones they can directly move), in low growth, it will lower the rates in order to promote available capital lending) for companies to finance their growth.
- The following points on the yield curve (past the Fed Rate) reflect the expectancy of the market as to the sum of short term rates
- If short term inflation is expected to be contained, the short term rates may be higher than the medium and long term ones, leading to an INVERTED Yield Curve

CAP
Capital Advisory Partners
Alternative Investments

Yield / Price

- The relationship between yield of bonds and their price is opposite and linked by the “Duration” of the bond
- If 1 year rates go from 4 to 5%, how would a bond of 4% coupon react?
- The Net Present Value of a 4% coupon in one year on a 100% cash outlay at 4% rate is 100%, I am essentially investing 100 for one year (which cost me 4%, the market rate) to get 4% from the bond’s coupon
- The net present value of this 4% coupon if rates go up to 5% becomes different as it has become less attractive than the going market rate of 5%, hence the price of the bond must reflect a discount to make it as attractive as the market rate (efficiency of markets), the discount of 1% (Bond price: 99%) would give me a 4% coupon and a 1% (100-99) capital appreciation, or 5%, the same as the market rate
- On a 2 year bond, the discount has to be twice as big as it would take a 2% capital appreciation to compensate the loss between the market rate and the coupon of the bond (4% + 4% = 8 to be compared to 2*5% market rate)
- The relationship between a yield and a price is said to be opposite and linked by the “Duration” of the bond

CAP
Capital Advisory Partners
Alternative Investments

Basic notions of Credit

- Would you lend money to someone making £100k per year or £10k
- Would you lend money to someone with a stable job, or a volatile one
- Would you lend money to a homeowner or to a tenant

CAP
Capital Advisory Partners
Alternative Investments

Basic notions of Credit

- You will lend to anybody whom you can analyse
- Your analysis will determine a risk for the loan
- The risk can be transformed into statistical probabilities of not paying back
- For those loans in default you may also assess the assets on which you may have placed a lien and the recovery rate

CAP
Capital Advisory Partners
Alternative Investments

Determining the value of Credit

- The value of credit can be determined as the sum of the following factors:

1. Risk free borrowing rate
2. Probability of default
3. Estimated recovery rate
4. Cost of uncertainty
5. Profit margin

CAP
Capital Advisory Partners
Alternative Investments

Statistical value of Credit

A simple example to illustrate:

- Your roommate makes £25k, owns a £10k car and wants to borrow £20k for one year to take his bride on a honeymoon.
- The probability that he will default is high as his annual income is barely covering the borrowed sum, let's assume 75%
- If he defaults, the recovery will be the value of his car, or 50% of the loan's value
- It would be logical to ask a credit premium of 37.5% for one year, over your cost of borrowing, as this would be the 75% probability of losing 50% on your loan

CAP
Capital Advisory Partners
Alternative Investments

Statistical value of Credit

The premium of uncertainty also highly influences the value of the credit margin.

When you are dealing with one million credit card borrowers, your statistical knowledge of the pool is highly accurate and based on various economical environments

When dealing with a limited universe of borrowers, the uncertainty rises and warrants a higher margin of safety

CAP
Capital Advisory Partners
Alternative Investments

Rating Agencies

- Rating agencies are statistical watchdogs of borrowers, they assign a rating to each entity (corporate, individual, government)
- Historical tables are available with the probability of default for each rating per year, and the transitional probabilities
- Historical recovery rates are also made available by the agencies

CAP
Capital Advisory Partners
Alternative Investments

Rating Agencies

Rating agencies utilise a grid reference notation most often along the lines of Aaa as the highest quality, then Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3 which marks the limit of that which is known as “investment grade”

Further ratings go Ba1….Caa1..Ca1…C1 end finally D which stands for default

CAP
Capital Advisory Partners
Alternative Investments

Validity of ratios on actual ratings

	AAA	AA	A	BBB	BB	B
1. EBIT interest cover	21.4x	10.1x	6.1x	3.7x	2.1x	0.8x
2. EBITDA interest cover	26.5x	12.9x	9.1x	5.8x	3.4x	1.8x
3. Funds flow to total debt	128.8%	55.4%	43.2%	30.8%	18.8%	7.8%
4. Free operating cash flow to total debt	84.2%	25.2%	15.0%	8.5%	2.6%	-3.2%
5. Return on capital	34.9%	21.7%	19.4%	13.6%	11.6%	6.6%
6. Operating margin	27.0%	22.1%	18.6%	15.4%	15.9%	11.9%
7. Total debt to total capital	22.9%	37.7%	42.5%	48.2%	62.6%	74.8%

Source: S&P, Key industrial financial ratio medians, 1998-2000

CAP
Capital Advisory Partners
Alternative Investments

Validity of ratios on actual ratings

	A	BBB	GM (Baa1/ BBB)	Ford (Baa1/BBB)	Daimler Chrysler (A3/BBB+)	BB
1. EBIT interest cover	6.1x	3.7x	**3.6x**	**0.3x**	**3.0x**	2.1x
2. EBITDA interest cover	9.1x	5.8x	**10.4x**	**4.2x**	**9.5x**	3.4x
3. Funds flow to total debt	43.2%	30.8%	**NA**	**60.1%**	**75.7%**	18.8%
4. Free operating cash flow to total debt	15.0%	8.5%	**15.8%**	**13.8%**	**12.4%**	2.6%
5. Return on capital	19.4%	13.6%	**12.1%**	**1.3%**	**6.3%**	11.6%
6. Operating margin	18.6%	15.4%	**2.4%**	**0.3%**	**2.3%**	15.9%
7. Total debt to total capital	42.5%	48.2%	**68.2%**	**74.5%**	**33.6%**	62.6%

Source: S&P, Key industrial financial ratio medians, 1998-2000

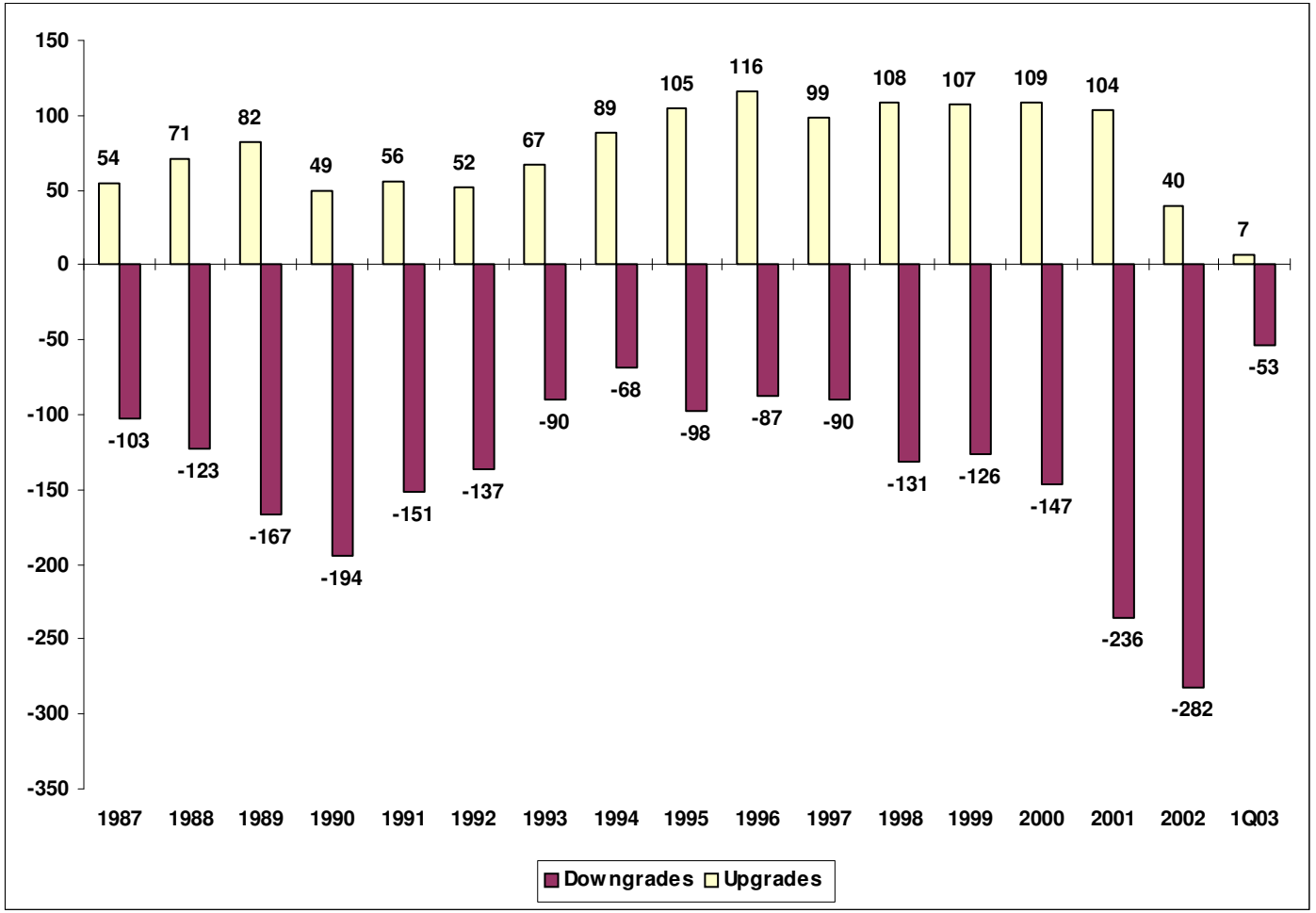
CAP
Capital Advisory Partners
Alternative Investments

Time value of Credit

- Aside from statistical understanding of your pool of borrowers, a concept we learned regarding fixed income also applies
- The longer the loan, the more uncertainty and opportunity cost, hence a normal positively sloped credit spread curve
- Quality of credit can also change over time, leading to transitional risk, an option on which can be priced

CAP
Capital Advisory Partners
Alternative Investments

Evolution of numbers of downgrades vs. upgrades



Source Moody's investor

CAP
Capital Advisory Partners
Alternative Investments

Credit instruments' short history

The original credit instrument is a note recognizing a debt, a date of repayment, an interest payment and where applicable a lien (a pound of flesh). These are known today as Bank Notes

Today Bonds have become a large corporation's highest source of financing

The legalese of instruments allow for pledging of assets, ranking of the debt, introduction of options on the equity of the company (Convertible Bonds) etc..

CAP
Capital Advisory Partners
Alternative Investments

Credit instruments' short history

Capital Markets had originally access to the bank notes to exchange, then corporate bonds , followed by Convertible bonds which all represent a direct investment into the company

The disintermediation of financial markets which have arisen from the increase in bank's capital reserve requirements has led to corporates accessing the capital markets directly by issuing bonds

Investors have then found a need for their portfolios to have access to hedging instruments

CAP
Capital Advisory Partners
Alternative Investments

Credit Default Swaps

Hedging arose with the introduction of Credit default Swaps in which the payer of the premium purchases the right to deliver an underlying company's bonds at par value

The mechanics are as follow:

1. As long as the company doesn't default, the payer, continues to pay on a quarterly basis the premium
2. If the company declares an event of default, the payer stops paying the premium, delivers the nominal amount of bonds and gets his nominal amount of monies, effectively cancelling his potential loss arising from the default of the company

CAP
Capital Advisory Partners
Alternative Investments

Further derivatives

Once the mechanics of derivatives are set in place and tested through actual occurrences, then multiplication of tools occurs. First baskets of diversified risks are set up, first to default (out of 10 names any default hits the seller of protection for the whole nominal value), Indices such as the MSCI, or JP Morgan's with sectorial, rating, geographical break ups allow for investors to take risk on a specific segment of the World's borrowers (such as Eastern European Caa rated borrowers)

CAP
Capital Advisory Partners
Alternative Investments

Further derivatives

CDOs are a securitization in which a pool of borrowers is grouped and the risk is divided between different classes of investors. The first losses will go to the equity investor, the following to the mezzanine tranche and finally to the senior/super senior investors. Each one of the tranches is expected to receive higher income for higher risk exposure. You may invest in CDS on securitizations which are real investments (CLO) or virtual (CDO). Securitisations can also apply to Mortgages of residential/commercial property, credit card debts, car loans, etc

CAP
Capital Advisory Partners
Alternative Investments

Negative Convexity

When the credit of a borrower improves, the reduction in the credit margin is inferior to the amplitude of the movement on the negative if it gets downgraded. This is called negative convexity

It is easy to understand that when you are dealing with a derivative on a negatively skewed instrument, the derivative becomes that much more skewed, hence the very strong losses on CDS of mezzanine tranches of CDOs which plagued the news in the Spring of ‘05

CAP
Capital Advisory Partners
Alternative Investments

Credit Hedge Funds

Hedge Funds specifically investing in Credit rely on

1. standard long/short strategies playing degradation of one's market value and improvement of the other
2. Distressed: buying debt of a company under financial duress, playing an improvement in it's credit quality, analysing it's recovery value in the case of default
3. Event driven of mergers, acquisitions which impact the credit quality of both the target and the acquirer
4. Capital structure arbitrage analyses the relationship between the credit, the equity and the option's markets to determine arbitrage opportunities
5. And of course traditional directional trades

CAP
Capital Advisory Partners
Alternative Investments

Leverage

- The value of credit spreads goes from a very small amount (5 basis points per year) for the highest ranked and rated issuers, to up-front payments of tens of percentage points (remember your neighbour at 37.5%)
- It is therefore logical that a risk adjusted investment process will vary leverage with risk. A high yield bond which can move 10% in one day would probably only represent a small portion of a portfolio (let's say 5%), whilst a high grade bond which moves 0.01% in a day (independently of interest rate movements) could be leveraged 50 times and represent the same risk as the high yield bond
- Notions of leverage on Credit hedge funds are therefore not pertinent in discussions of risk, leverage is very pertinent when it comes to CDOs or any kind of securitization

CAP
Capital Advisory Partners
Alternative Investments

Risk of Statistical non-validity

We talked of the negative convexity of credit (the same applies to interest rate instruments that are risk free), there is another aspect to take into consideration which relates to out of the statistical data events such as a strongly rated company announcing surprise restructuring of it's financial data due to fraud or large litigation issues, this can lead to a movement which will be 20 or more standard deviations away from the normal volatility. Remember that one day a Aaa rated company closed the following day and defaulted on the payment of it's debt (Drexel-Burnham-Lambert), the investor whom would have been a payer of the CDS would have had a very high risk return profile.

CAP
Capital Advisory Partners
Alternative Investments

Please always feel free to contact CAP for any further explanations:

Sven Miserey
Capital Advisory Partners Ltd
4, Montpelier St, #120
London SW7 1EE
+44 207 193 1645
sven@capital-advisory.com

CAP
Capital Advisory Partners
Alternative Investments