



Money Market



Money Market

- IOUs issued by government, banks, corporations
- Short-term financial instrument
 - Usually matures in less than one year
- Liquid and high denominations
- No physical trading floors
 - trading over the phone, telex or fax
 - Price info supplied by Reuters, Telerate, brokers



Participants

- Borrowers
 - Corporations, banks, governments
- Investors (lenders)
 - Pension funds, insurance companies, mutual funds, corporate treasurers
- Dealers (quoting bid and offer prices)
 - Investment banks, securities houses
- Brokers (highest bid and lowest offer)

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Factors affecting value of debt

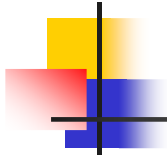
- Credit Risk

Issuer not being able to meet its obligations. Higher risk for longer term.
- Liquidity Risk

Not heavily traded. Wide spread quotes.
- Market Risk

Change in market conditions.

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Time Value of Money

In most developed markets, government securities is assumed credit risk-free.

For stable market conditions, should long-term rates be higher or lower than short-term rates? Why?

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Yield Curve

Yield curve displays graphically the relationship between interest rates for different maturities – the term structure of interest rates.

Yield curve reflects expectations about future interest rates. An upward slope means that short-term rates are expected to rise/fall?
What if the yield curve is flat?

Yield Curve Example

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Credit Risk

In bank lending the bank determines the credit risk of the borrower and adjusts its rates accordingly.

Credit ratings agencies:
Standard & Poor's
Moody's Investor Service
Fitch Ratings

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Credit ratings – long-term paper

	S&P	Moody's
Best-quality grade	AAA	Aaa
	AA+	Aa1
High-quality grade	AA	Aa2
	AA-	Aa3
	A+	A1
Upper-medium grade	A	A2
	A-	A3
	BBB+	Baa1
Medium grade	BBB	Baa2
	BBB-	Baa3


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Credit ratings – short-term paper

S&P	Moody's
A1+	P1
A1	
A2	P2
A3	P3


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Sample Rating



ANNOUNCEMENT: Moody's Affirms HSBC Holdings (Senior at Aa2/P-1); Maintains Positive Outlook
CREDIT: [HSBC Holdings plc](#) 22 JUN 2007

Moody's Affirms HSBC Holdings (Senior at Aa2/P-1); Maintains Positive Outlook The ratings affirmation reflects the HSBC Group's excellent diversification, its strong and improving financial fundamentals, and its conservative risk profile. Conversely, further signs of relative weakness in the group's risk management processes, or a material weakening in the group's very strong financial fundamentals could put negative pressure on the ratings. London Financial Institutions Group Moody's Investors Service Ltd. London Financial Institutions Group Moody's Investors Service Ltd.



RATING ACTION: Moody's upgrades Hong Kong's ratings
CREDIT: [Hong Kong, Government of](#) 26 JUL 2007

Moody's upgrades Hong Kong's ratings Hong Kong, July 26, 2007 -- Moody's Investors Service has upgraded the foreign- and domestic-currency bond ratings of the Hong Kong government to Aa2 from Aa3 to reflect a strengthening of Hong Kong government finances and its external position. "This resilience means that a rating gap between Hong Kong and China is justified, even though Hong Kong and the mainland have become increasingly integrated." New York Sovereign Risk Unit Moody's Investors Service JOURNALISTS: 212-553-0376 SUBSCRIBERS: 212-553-1653 Senior Vice President - Team Leader Sovereign Risk Unit Moody's Investors Service JOURNALISTS: 212-553-0376 SUBSCRIBERS: 212-553-1653 Steven A. Hess Sovereign Risk Unit Moody's Investors Service

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Money Market Instruments

- Treasury bill Government
- Time Deposit
Certificate of Deposit Bank
- Banker's acceptance Bank
- Commercial Paper Corporation
- Repurchase agreement

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Terminology

Eurodollar

U.S. dollar-denominated deposits at banks outside of the U.S.

Coupon

Interest rate stated on an instrument when it is issued

Discount Instrument

An instrument which does not carry a coupon is a "discount" instrument. Discount equals the difference between the price paid for a security and security's par value.

Bearer/registered

A "bearer" security is one where the issuer pays the principal (and coupon if there is one) to whoever is holding the security at maturity.

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Terminology

Fixed Income Security

Money market instrument whose future cash flows have been contractually defined and can be determined in advance.

Yield to Maturity

YTM is the rate of return that you would achieve on a fixed income security, if you bought it at a given price and held it to maturity

LIBOR, HIBOR

Interbank offered rate – interest rate at which one bank offers money to another bank.

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DAY/YEAR Conventions

$$\text{Interest paid} = \text{interest rate quoted} \times \frac{\text{days in period}}{\text{days in year}}$$

Most money markets use ACT/360

Exceptions using ACT/365:

International and domestic:

Sterling, Hong Kong dollar, Singapore dollar, Malaysian ringgit, Taiwan dollar, Thai baht, South African rand

Domestic (but not international):

Japanese yen, Canadian dollar, Australian dollar, New Zealand dollar

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Eurodeposit

Round-the-clock business spanning Singapore and Hong Kong, Bahrain, Frankfurt, Paris, London and New York

LIBOR – the rate dealers charge for lending money (they offer funds)

LIBID – the rate dealers pay for taking a deposit (they bid for funds)

In London, quote (offered rate – bid rate)

Other places, quote (bid rate – offered rate)

Rule: pay the higher rate for a loan, receive the lower for a deposit

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Fixed Date Conventions

Short Dates

Overnight (O/N)	Starting today and maturing tomorrow
"Tom-next" (T/N)	Starting tomorrow and maturing the next day
Spot-next (S/N)	Starting on the spot date and maturing the day after spot
Spot-one week (S/W)	Starting spot and maturing seven days later

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Fixed Date Conventions

End/End Rule

If the spot date is a month-end, then all forward fixed dates will be month end

Month-End Roll Back

If the forward date lands on a month-end and that happens to be a weekend or a holiday, then it cannot be rolled forward to the next month. Settlement will be rolled back to the last working day of the same month

Example:

A two-month Eurodeposit booked in London on 26 February will be for value 28 February, the spot date. Since this is a month-end, the deposit will mature on 30 April. If 30 April is a Sunday, the deposit will mature on 28 April.

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Time deposit/loan

<i>term</i>	1 day to several years, but usually less than 1 year
<i>interest</i>	usually all paid on maturity
<i>quotation</i>	as an interest rate
<i>currency</i>	any domestic or international currency
<i>settlement</i>	generally same day for domestic, 2 working days for international
<i>registration</i>	no
<i>negotiable</i>	no

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Certificate of deposit (CD)

<i>term</i>	generally up to one year
<i>interest</i>	usually pay a coupon
<i>quotation</i>	as a yield
<i>currency</i>	any domestic or international currency
<i>settlement</i>	generally same day for domestic, 2 working days for international
<i>registration</i>	usually in bearer form
<i>negotiable</i>	yes

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CD - Pricing

Price = present value

Consider CD paying only one coupon at maturity:

$$\text{maturity proceeds} = \text{face value} \times \left(1 + \text{coupon rate} \times \frac{\text{coupon period (days)}}{\text{year}} \right)$$

$$\text{Price} = \frac{\text{face value} \times \left(1 + \text{coupon rate} \times \frac{\text{coupon period (days)}}{\text{year}} \right)}{\left(1 + \text{interest rate} \times \frac{\text{days}_{\text{purchase to maturity}}}{\text{year}} \right)}$$

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CD - Return

$$\text{yield} = \left(\frac{\text{FV}}{\text{PV}} - 1 \right) \times \frac{\text{year}}{\text{days}}$$

$$\text{yield} = \left(\frac{\text{sale price}}{\text{purchase price}} - 1 \right) \times \frac{\text{year}}{\text{days held}}$$

$$\text{yield} = \left(\frac{\left(1 + \text{interest rate}_{\text{purchase}} \times \frac{\text{days}_{\text{purchase to maturity}}}{\text{year}} \right)}{\left(1 + \text{interest rate}_{\text{sale}} \times \frac{\text{days}_{\text{sale to maturity}}}{\text{year}} \right)} - 1 \right) \times \frac{\text{year}}{\text{days held}}$$

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CD - Example

<i>issuer</i>	XYZ
<i>rating</i>	A1P1
<i>issue date</i>	1 January 2007
<i>maturity</i>	1 January 2008
<i>face value</i>	\$1,000,000
<i>interest</i>	5% pa

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CD - Example

$$\text{maturity proceeds} = \$1,000,000 \times \left(1 + 0.05 \times \frac{365}{365} \right) = \$1,050,000$$

Now only 61 days left to maturity and current 2 month deposit rates are 4%

$$\text{Price} = \frac{\$1,050,000}{\left(1 + 0.04 \times \frac{61}{365} \right)} = \$1,043,027$$

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CD - Example

You are offered \$1,042,800 for the CD. What yield does this represent?

$$\begin{aligned} \$1,042,800 &= \frac{\$1,050,000}{\left(1 + \text{yield} \times \frac{61}{365} \right)} \\ \text{yield (YTM)} &= \left(\frac{\$1,050,000}{\$1,042,800} - 1 \right) \times \frac{365}{61} = 0.0413 \end{aligned}$$

Secondary market price quote is 4.13%

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CD – quoted price

If you were quoted 4.13 – 3.89 for the 5% XYZ CD, this means that the market maker is willing to buy it from you for a cash amount that will give him a yield 4.13%, or he will sell it to you for a cash sum that will yield you 3.89%

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Treasury Bill (T-bill)

<i>term</i>	generally 13, 26 or 52 weeks
<i>interest</i>	mostly non-coupon bearing, issued at a discount
<i>quotation</i>	US and UK a “discount rate” basis; most places on a true yield basis
<i>currency</i>	usually the currency of the country
<i>registration</i>	bearer security
<i>negotiable</i>	yes

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US Treasury Bills

- Federal Reserve auctions 13- and 26-week T-bills on behalf of the US government every Monday, for delivery on Thursday
 - Also auctions 52-week bills every month
 - Settlement in the secondary market is for the following business day, i.e., T+1
 - “No” risk of default
- Are yields on T-bills lower or higher than those available in CDs?

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Discount rate quote

The quoted rate on a US T-bill with 50 days to maturity is 4.12% (discount basis). How much would you have to pay for the bill, for a \$1,000,000 deal?

$$\$1,000,000 - \left(\$1,000,000 \times 0.0412 \times \frac{50}{360} \right) = \$994,278$$

$$\text{Price} = \text{Face Value} \times \left(1 - \text{Discount Rate} \times \frac{\text{days to maturity}}{\text{year}} \right)$$

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Discount to Yield Conversion

$$\text{Price} = \text{Face Value} \times \left(1 - \text{Discount Rate} \times \frac{\text{days to maturity}}{\text{year}} \right)$$

$$\text{Price} = \frac{\text{Face Value}}{\left(1 + \text{yield} \times \frac{\text{days to maturity}}{\text{year}} \right)}$$

$$\text{yield} = \frac{\text{discount rate}}{\left(1 - \text{discount rate} \times \frac{\text{days to maturity}}{\text{year}} \right)}$$

$$\text{discount rate} = \frac{\text{yield}}{\left(1 + \text{yield} \times \frac{\text{days to maturity}}{\text{year}} \right)}$$

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Commercial Paper (CP)

<i>term</i>	for US, from 1 to 270 days; usually very short-term for ECP, from 2 to 365 days; usually 30 to 180 days
<i>interest</i>	non-interest bearing; issued at a discount
<i>quotation</i>	for US, on a "discount rate" basis for ECP, as a yield
<i>currency</i>	for US, domestic US\$ for ECP, any Eurocurrency but largely US\$
<i>settlement</i>	for US, same day for ECP, 2 working days
<i>registration</i>	in bearer form
<i>negotiable</i>	yes

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Bill of exchange/ Banker's acceptance

<i>term</i>	From 1 week to 1 year but usually < 6 months
<i>interest</i>	non-interest bearing; issued at a discount
<i>quotation</i>	for US and UK, quoted on a "discount rate" basis elsewhere on a yield basis
<i>currency</i>	mostly domestic
<i>settlement</i>	available for discount immediately on being drawn
<i>registration</i>	none
<i>negotiable</i>	yes

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Repurchase agreement (repo)

<i>term</i>	usually for very short-term
<i>interest</i>	difference between purchase and repurchase prices
<i>quotation</i>	as a yield
<i>currency</i>	any currency
<i>settlement</i>	Generally cash against delivery of the security
<i>registration</i>	n/a
<i>negotiable</i>	no

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