

# ***EMERGING CAPITAL MARKETS***

## **Lecture 4: Emerging Debt Markets**

**Dr. Edilberto Segura**

**Partner & Chief Economist, SigmaBleyzer**

**Chairman, Advisory Board, The Bleyzer Foundation**

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$$P = \sum (C)/(1+y)^t + (M)/(1+y)^n$$

$$y \cong \frac{C + (M - P) / n}{(P + M) / 2}$$

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- (iii) **Sovereign Risk**, the risk that the country will not honor contractual obligations concerning its debt.
- (iv) **Liquidity Risk**, the risk that the bond can not be sold readily at a price close to the current price.
- (v) **Agency-type Risk**, risk that the value of the bond may decline due to actions taken by the issuer.
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# I. The Global Debt Crisis of the 1980's and Brady Bonds

- During the 1970s and early 1980s, Emerging Markets accumulated significant amounts of **foreign debt**, as commercial banks placed their excess liquidity from oil producing depositors to willing borrowers in EMs.
- A Government guarantee was the only requirement for lending: sound project lending with due diligence was ignored.
- This debt consisted mainly of **non-tradable** eurodollar bank **loans** by international banks to 17 Governments, many in Latin America.
- Most heavy indebted countries did not have sound economic policies (in 1979/80/81, their average inflation rate was 47% and their ratio of debt to exports averaged 1.85).
- **The crisis started in 1982**, when Mexico stopped servicing its debt and technically went into default. Other countries followed it.

- The information on the excessive amounts of debt provided by banks and contracted by EMs was not known to banks at the time (Mexico had just borrowed US\$7 billion in the previous 6 months).
- Although economic fundamentals caused the crises (poor macro conditions and excessive lending ), **it was exacerbated** by a drop in commodity prices and tight monetary policies (sharp increases in interest rates) in the USA, which increased the cost of debt in EMs.
- **From 1982 to 1987**, NY banks and the Fed plotted not to recognize the loan losses, to avoid widespread bank bankruptcies. Instead they operated with “fat spreads” to build up their capitalization.
- NY banks only restructured this debt through rescheduling, IMF loans and debt-equity swaps (Baker Plan), but with little success.
- These schemes just gave huge profits to investment banks.
- **By the late 1980's**, total EM foreign debt:
  - reached US\$1.2 trillion (45% of GDP)
  - required debt service of US\$140 billion pa (5.2% of GDP)
  - negative transfers amounted to US\$28 billion pa.

- The option of **debt reduction** was strongly rejected by the banks and the US, as they feared that it would break financial discipline.
- **BUT, in 1987**, Brazil declared a moratorium on interest payments.
- Citibank made a \$3 billion loan-loss reserve (25% of LDC loans).
- Citibank loans to LDCs amounted to 79% of primary capital (equity plus loss reserves); 112% for Chase, 124% for Bank of America.
- The possibility that the US banks may collapse and jeopardize the banking system led the Fed and the US Treasury to act with more definite plans to resolve the crisis.
- **In 1989, the Brady Plan was introduced: it officially blessed collective debt reduction conditioned upon economic reform.**
- Debt reduction by banks would be supplemented by new lending by the IMF and the World Bank, provided that it took place in the context of strong economic adjustment programs approved by the IMF/World Bank. These two institutions took a central role in the resolution of financial crises.
- Part of the debt & debt service would be reduced; the rest would be converted into guaranteed bonds (**Brady bonds**).

- **In 1990**, for Mexico, after lengthy negotiations, three options were offered to banks, with different accounting and tax implications:
  - (1) The banks could convert old loans into **new tradable bonds with guarantees attached** (at Libor +13/16) but worth 65% of the face value of the old paper. (\$20 bn or 45% of the old debt chose this.)
  - (2) The banks could convert all their entire face-value debt into new **guaranteed bonds**, whose fixed interest rate was 6.25% pa (a major debt service reduction). (\$22.5 bn or 51% agreed to this option.)
  - (3) The banks could keep their old loans, without guarantees, and provide new money worth 25% of their exposure value. (Only \$1.5 billion or 4% agreed to this option.)
- The fair market value of options (1) and (2) was about 35% of par, compared to a market price of 40% (but based on thin markets).
- Thus, the banks took an **effective economic loss of 65%** of their \$44 bn loans. But, the accounting loss was 35% for (1) and zero for (2).
- The new guaranteed bonds (**Brady Bonds**) were US\$, 30-year **bullet** bonds, whose principal payment was collateralized by a US Treasury zero-coupon bond specially issued for this purpose.

- The purchase of the US bond was financed by the IMF/World Bank (the US bond at 7.5%, for 30 years, had a PV - Price - of only 11% or \$4.8 bn).
- Interest payments were guaranteed for a rolling period of 18 months by adjustment loans made by the IMF, World Bank and Japan.
- A similar *menu approach* worked well for other countries, such as Brazil, Argentina, Venezuela, Morocco, Bulgaria, Poland, Nigeria.
- Over 20 EMs issued Brady bonds with a total capitalization of US\$180 billion. Many had options, linked to the price of commodities (e.g., Venezuela on oil).
- With improved creditworthiness, since 2000, many EM countries have placed Eurobonds at lower spreads than Brady bonds of similar duration, after adjustment to remove the effect of Bradies' collateral.
- This had led to large exchanges of Bradies for eurobonds: In 2003, Mexico was the first country to retire all its Brady Bonds. By late 2006, the total amount of Bradies outstanding was only \$10 billion (mainly from Ivory Coast, Peru, Poland, Nigeria, Panama and Philippines).
- Although the stock of Bradies has been reduced, many of the innovations introduced in these restructurings (the options and derivatives embedded in the bonds, "stepped" coupons, Pars and Discounts) were retained in later sovereign restructurings, such as in Ecuador.

- The Brady Bond development led to a move from “**promissory note**” lending to more **liquid tradable securities with derivative inducements**.
- Other debt reduction programs for EMs have been developed, including:
  - **Debt-for-Equity Swaps**: Foreign debt can be converted into local currency and used to buy equity in local companies, including for privatization. For example, in Chile, its debt was converted into local currency at 85% of face value and used for equity purchases in enterprises.
  - **Debt-for-Nature Swaps**: An NGO (such as the World Wildlife Fund) buys foreign Government debt and agrees to forgive it, if the country undertakes an agreed upon conservation measure, such as protecting tropical forests (Madagascar, Mexico, Costa Rica).

## II. Bank Lending to Emerging Markets

- The instruments used by developed countries to provide debt financing to EMs are:
  - (1) **Bank Loans and Notes** (under which the international banks use their own resources for lending), and
  - (2) **Bonds** (Foreign bonds/ Eurobonds, which are placed with a large number of bank & non-bank investors).
- Although on a net basis, EMs have had large net repayments to international banks, on a gross basis, new bank loans to EM are significant.
- In 2008, Asia and Central/Eastern Europe were the largest bank borrowing regions (65% of the total).

- The main providers of **bank lending to Emerging Europe** were Austria, Germany, Italy and France.
- Spain and the US were the largest bank lenders to **Latin America**.
- **Asia** was funded mainly by the UK, US, Germany and Japan.
- France and Germany provided most bank loans to **Africa**.
- **The terms and conditions on bank loans are evolving:**
  - Interest rates on loans are continuing to converge to yields of eurobonds.
  - Maturities have been declining, with about 50% of loans with less than 3-years maturity and 70% with less than 5-years maturity (compared to more than 80% of eurobonds with more than 5-years maturity)
  - Loans are arranged and placed with a smaller number of banks.
  - Speed of arrangement has increased.
- Bank loans are able to compete with Bonds on the basis of speed and flexibility.

# Who lends to Emerging Markets?

Claims of BIS reporting banks on emerging markets (% share of bank lending to EM regions)

Recipient	Total (US\$ trn)	Austria	Belgium	France	Germany	Italy	Japan	Neth.	Spain	Sweden	Switz.	UK	Europe	Euro9*	US
EM Europe	1.64	18%	8%	11%	13%	13%	2%	6%	1%	6%	4%	3%	91%	54%	4%
Latin Amerc	0.98	0%	1%	4%	4%	1%	2%	11%	32%	0%	5%	10%	69%	54%	18%
Asia	1.47	1%	2%	8%	9%	1%	9%	7%	0%	0%	6%	22%	56%	27%	16%
Africa	0.58	1%	2%	19%	11%	1%	4%	4%	1%	0%	4%	33%	80%	40%	7%
<b>Total EM</b>	<b>4.67</b>	<b>7%</b>	<b>4%</b>	<b>10%</b>	<b>9%</b>	<b>5%</b>	<b>4%</b>	<b>7%</b>	<b>7%</b>	<b>2%</b>	<b>5%</b>	<b>14%</b>	<b>74%</b>	<b>46%</b>	<b>11%</b>

\* Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Portugal Spain

\*\* Foreign bank claims on EM as % of total foreign bank claims of BIS banks

Source: BIS Quarterly Review September 2008

J.P.Morgan

## History of International Bank Lending.

- The evolution of international bank lending to Emerging Markets has been intimately linked to the Eurocurrency markets.
- The Eurocurrency market is the market for deposits, loans and securities placed in a regulatory framework of a country with a different currency.
- Initially, in the 1950s, the eurocurrency market started when the former Soviet Union moved US dollar deposits to banks in London and Paris, because of fears that the US may seize them in a crisis.
- Given the large size of these deposits, the European banks decided to use them in Europe, rather than returning them for investment in securities in the US, as was customary done.

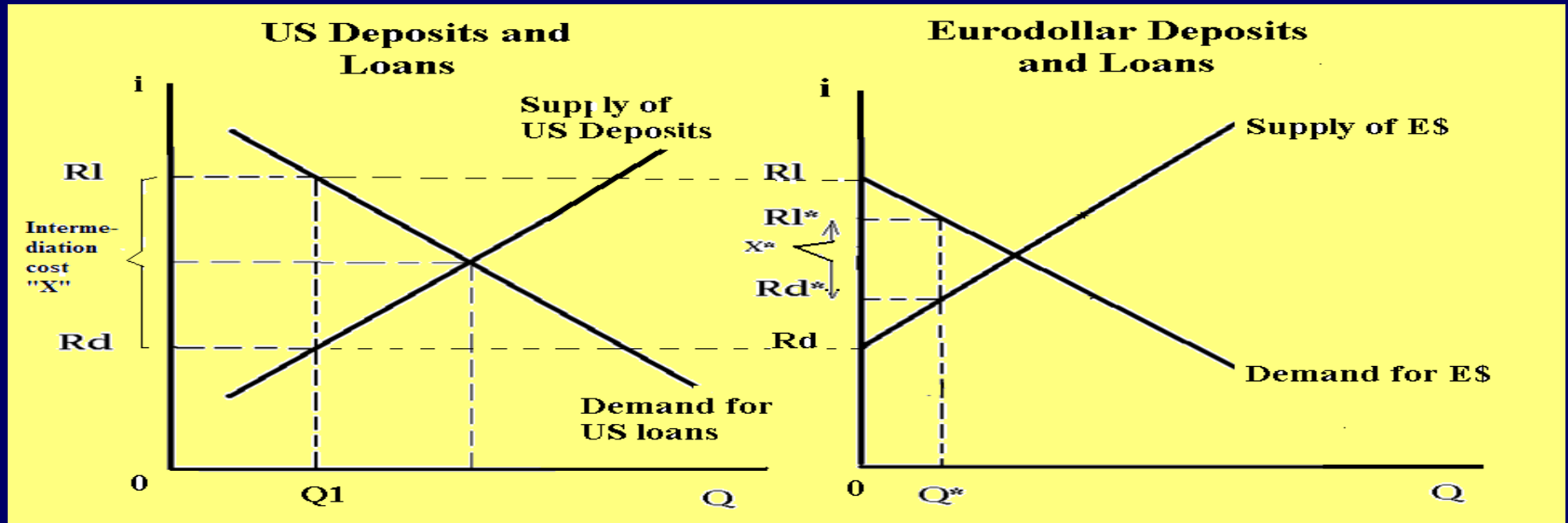
- During the past 30 years, the Eurocurrency market developed due to:
  - (i) liberalization of capital accounts in Europe & elsewhere;
  - (ii) the market's mechanism that removes international borrowing and lending from the jurisdiction and influence of national authorities.
    - For example, dollar denominated loans, deposits and bonds in Europe are not subject to US banking or security regulations and constraints.
    - This is done simply by locating the credit market outside the country of that currency.
  - (iii) low institutional and administrative costs. In fact, the existence of the eurodollar market depends on low intermediation costs.
- World Eurocurrency deposits have grown by 15% per annum, from \$200 billion in 1973 to about \$20 trillion in 2010 (after netting out all interbank deposits).

## Separability of Pricing from Commitment Period.

- Before the eurocurrency market, a 5-year loan bore a 5-yr interest rate.
- The competitiveness of the eurocurrency market changed that.
- Banks were compelled to pay current market rates for their short-term time deposits, mostly 3-6 month (there are no demand deposits).
- Banks therefore had to let the interest rate on their loans vary with the cost of deposits: Three and six-month floating interest rates emerged (**LIBOR Rates - London Interbank Offered Rate**).
- This permitted commitment periods of one to 12 years.
- LIBOR is the rate at which selected banks offer funds for deposit to other banks in the London interbank market. That is, it is the rate at which a bank is willing to lend money to other banks in the wholesale interbank market.
- The three- and six-month LIBOR rates are used for costing most loans.
- LIBOR is computed by the British Bankers Association (BBA) at 11:00 AM London time each business day.

- The rate at which banks **bid** for eurocurrency deposits is called **LIBID** (London Interbank Bid rate).
- LIBID is the rate at which a bank is willing to borrow money.
- As a practical matter, if a bank has excess cash, it has to place these excess funds at a somewhat lower rate than LIBOR. In this case, it would normally expect to receive only LIBID.
- Normally, LIBID is only about 0.02%-0.04% below LIBOR (e.g., if LIBOR is 5.40%, LIBID should be around 5.37%).
- The BBA does not compile indicative LIBID rates, but they are published daily by the Wall Street Journal.
- Depending on the creditworthiness of non-bank borrowers, funds are lent to governments and private firms at spreads over LIBOR that traditionally had varied from **0.2% to 4.0% over LIBOR**, except in cases of distress lending in crises.
- Most loans carry commitment fees of 1/4% to 1% pa on uncommitted amounts and a maximum period of 18 months for full withdrawal. They may also carry closing fees.

# Pricing Eurocurrency Deposits/Loans: Loanable Funds.



Equilibrium in the US will be at  $Q_1$  and depends on intermediation costs “ $x$ ” – the difference between lending ( $R_l$ ) and deposit rates ( $R_d$ ).

- If I deposit dollars in the US, I can get  $R_d$ . Therefore, I need an interest rate of at least  $R_d$  to “Supply” (deposit) eurodollars abroad.
- If I can borrow in the US at  $R_l$ , I’ll pay at most  $R_l$  to “Demand” ECs.
- Equilibrium in Eurodollars will occur at  $Q^*$ ,  $R_l^*$  and  $R_d^*$

• Note that:  $R_l > R_l^* > R_d^* > R_d$

On Dec ‘11: New York Prime  $>$  LIBOR+1.5%  $>$  LIBID  $>$  US CD  
 $(3.25\%) > (0.8+1.5=2.3\%) > (LIBOR-0.04=0.76\%) > (0.7\%)$

- Typically:  $(R_l - R_d) \approx 3\%$ ; and  $(R_l^* - R_d^*) \approx 1.5\%$

## Syndication in Eurocurrency Bank Lending.

- Syndication is the process under which a number of bank lenders participate in providing various **portions** of a loan to a single borrower under a **single loan agreement**.
- Syndication started in the late 1960s, when **Bankers Trust** arranged a large loan to Austria, which it could not finance by itself.
- It is used now by banks to improve liquidity, diversify risks, place the loans widely, and lend large amounts to large borrowers, mainly Governments, which represent 70% of syndicated lending.
- Loan syndication typically involves a bank (**the manager**) and small group of knowledgeable and well-capitalized banks (**the co-managers**) that agree initially to provide the entire loan, under a several, rather than joint agreement with the borrower.
- These banks then sell portions of their shares of the credits to a wider range of banks (**participating banks**), either under “assignment” or just a “participation” arrangement.
- Syndication brought the elements of capital market underwriting and distribution into traditional bank lending.

- It provides borrowers with certainty about the amount and price of funds, while allowing wide distribution. Sometimes, syndication is made on a “best efforts basis”.
- Syndicated loans typically have a number of loan covenants, including:
  - **Ownership Clause:** The property of the borrower will be maintained.
  - **Negative Pledge Clause:** The borrower will not mortgage or commit any of its assets to third parties.
  - **Pari-Passu:** If guarantees are given to third parties, the same guaranties will be given to this operation.
  - **Cross-Default:** This operation can be in default if another loan of the borrower becomes in default.
  - **Cross-Acceleration:** If principal payments are advanced in other loans, they will also be advanced on this one.
  - **Material Adverse Change:** If circumstances were to bring adverse changes, the loan could be accelerated.

- In 2007, a record US\$328 billion were raised by EM firms under syndicated loans (both in Dollars and EUROS).
- But the 2008/2009 crisis reduced this amount to \$293 billion and \$280 billion.

*EM External Loan Syndication (\$ billion)*

	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
C/E Europe	11	13	20	31	40	58	63	73	65
(Ukraine				0.3	1.0	2.2	3.3	3.0	0.3)
Middle East	6	8	8	17	36	59	59	54	28
Africa	4	4	6	8	8	7	8	6	12
Latin America	18	10	13	20	19	26	46	31	32
Asia	<u>30</u>	<u>46</u>	<u>51</u>	<u>71</u>	<u>82</u>	<u>100</u>	<u>150</u>	<u>128</u>	<u>32</u>
Total	70	82	97	148	189	252	328	293	280

Source: IMF, Financial Stability Report, Sept 2009. 2009 estimates

## Bank Lending Instruments.

- Over the last 20 years, bank lending has moved away from promissory notes (non-tradeable) to securities (tradeables).
- Under “Bank Loans”, these securities are funded by the bank’s own resources. But later on the bank can sell them.
- By contrast, Eurobonds, to be discussed later, from the outset are widely funded by a variety of outside non-banking sources.
- **The main lending instruments in use for bank lending are:**
  1. Floating Rate Notes (FRNs)
  2. Euro Medium Term Notes (MTNs)
  3. Euronotes: Note-Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs).
  4. Euro Commercial Paper

## (1) **Floating Rate Notes (FRNs).**

- Traditionally, medium term loans were granted by banks on the basis of one single “promissory note”, which was not negotiable, could not be sold, and were quite illiquid.
- Only “participations” on it could be sold to other banks.
- After the debt crisis of the 1980s, there was a move towards “**securitization**” of a loan into a larger number of smaller parts, called **FRNs**, which were negotiable and could be sold.
- A FRN is a medium to long term “security” with quarterly or semiannual interest rates stated as a margin over or under **LIBOR**.
- Since FRNs have smaller size and are negotiable, they are more easily sold to other commercial banks.
- The development of FRN is closely linked to the development of syndications.
- They represent the largest group of eurocurrency instruments (about 50% of the total).

## (2) Euro Medium-Term Notes.

- Euro medium-term notes (MTN) are fixed- or floating rate, medium term obligations of well-established borrowers.
- But, unlike FRNs or bonds, MTNs are offered on a continuous basis in smaller amounts, as little as US\$2 million at a time.
- These notes are issued under a program that authorized a group of dealer banks to seek investors for amounts up to a limit.
- The notes are often tailored to investors' needs. In fact, often, an investor seeking a medium-term instrument from a good corporate name, will call several MTN dealers and the notes would be issued specifically for this investor, including term, rate basis, and currency denomination.
- This is why these MTN are called “investor driven”.
- The emergence of MTN in the 1980s has been one of the most significant developments. They now represent the second largest group of eurocurrencies (about 40% of the total).

### (3) Euro Short-Term Notes: Note-Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs).

- Under these facilities, the borrower issues short-term *discount notes*, known as **Short-term Euronotes** or just **Euronotes**, via several distribution channels, under the umbrella of a medium-term commitment (3 to 10 years) from a group of banks.
- These underwriting banks guarantee the issue, agreeing to purchase the notes, at a predetermined rate linked to LIBOR, if the notes can not be placed at or below that cap rate.
- Banks would then offer the Euronotes to another preselected group of banks (the Tender Panel), which will place them with investors.
- Euronotes are widely traded on the secondary markets.
- In a **RUF**, the guarantor and marketing banks are different.
- In a **NIF**, the guarantor and marketing banks are the same.

#### (4) Euro-Commercial Paper.

- These are short-term, bearer-form, general obligation notes issued by major, well-known corporations and Governments outside the country of the currency.
  - They are similar to Euronotes, traded on a *discount basis*, except that they are issued on a non-underwritten basis.
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- The move towards securitization of bank lending has added liquidity to the eurocurrency market.
  - But it has also made loan rescheduling more difficult, given the larger number of holders of the documents.

# III. Eurobond Markets

## Foreign Bonds and Eurobonds.

- A **Foreign Bond** is a long-term security issued by a foreign borrower for sale widely to a large number of investors in the domestic market of another country.
  - It is denominated in the currency of the country in which it is sold
  - Foreign bonds are subject to **all regulations** of the country in which the bonds are sold.
  - Therefore, they are similar to domestic bonds, except that the issuer may be beyond the reach of investors in case of default.
  - Foreign bonds have nicknames: a foreign bond is called a
    - “**Yankee**” bond if sold in the US
    - “**Bulldog**” bond if sold in the UK
    - “**Rembrandt**” if sold in Netherlands
    - “**Matador**” if sold in Spain
    - “**Caravela**” if sold in Portugal
    - “**Samurai**” bond if sold in Japan
    - “**Daimyo**” bond if sold in Japan by international banks.

- An ***Eurobond*** is a bond underwritten by an international syndicate of banks and marketed internationally in countries **other than** the country of the currency in which it is denominated.
  - The issue is thus not subject to national restrictions.
  - They differ from eurodollar securities because eurobonds enable borrowers to issue securities to **investors directly**, without fund intermediation by banks (except for underwriting/distribution).
  - That is, the **financing of Eurobonds** does not depend on **Eurocurrency deposits** in commercial banks.
  - Eurobonds emerged in 1964, when the US imposed the so-called Interest Equalization Tax on foreign bonds placed in the US. Withholding Taxes on interests created a further restriction.
  - To bring these resources home to the US, these taxes were eliminated later on.
  - Furthermore, the US permitted the formation of International Banking Facilities (IBFs) in the US, under which dollar deposits by non-residents were less regulated.

- In spite of these de-regulations, the market continued to grow, particularly because of its **bearer form** (not naming the owner).
- Eurobonds are always issued in bearer form, ensuring anonymity (with important tax implications).
- Because of this secrecy, Eurobond investors are prepared to accept lower yields than those given for equivalent securities at home.
- Since Eurobonds are bearer bonds, under US law, they can not be sold to US citizens; but there is no law prohibiting US citizens from buying them. Although the US has instituted some restrictions, they are not too demanding to meet.
- Another essential difference between domestic bonds and Eurobonds is that Eurobonds are not “**public offerings**”. Most countries treat them as “**private placements**” (the issue is placed with few large, well-informed and sophisticated investors).
- Private placements have less stringent regulatory and disclosure requirements.

- In June 2011, the total amount **outstanding** of international bonds by all countries was US\$28.6 trillion, of which international bonds outstanding by Emerging Markets amounted to US\$1.2 trillion, or about 4% of the total (BIS Source).
- The evolution of annual Eurobonds **issued** by Emerging Markets was rapid until 1997; then dropped by 40% in 1998 with the Asian Crisis and by 40% in 2008 with the international liquidity crisis.
- Eurobond issuance by EMs has now recovered to high levels:

(in US\$ billion):	<u>1997</u>	<u>1999</u>	<u>2001</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
Latin America	52	38	34	31	33	60	31	39	18	55
Asia	45	24	36	36	51	53	54	47	28	50
Europe	16	14	12	24	37	54	62	60	46	42
Africa	9	2	2	5	2	2	6	13	1	3
Middle East	3	4	6	2	10	18	29	25	13	30
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Total	126	82	89	99	134	187	183	184	106	180

Source: IMF, Global Financial Stability Report, October 2009. 2009 are estimates.

- The most common maturity in Eurobonds is 5 to 10 years (about 50% ), with 10-30 year maturities representing 30% .
- About 75% of Eurobonds are fixed-rate issues, and 25% are floating-rate issues over LIBOR (with spread of 0.25% to 3.0% ).
- These different markets are linked to one another through the currency swap markets, which provide contracts for future exchange of interest and principal in two different currencies.
- Normally Eurobonds have call provisions and sinking funds.

- Many Eurobonds contain inducements, such as convertibility, warrants (detachable options), indexation to equity, indexation to commodity prices, etc.
- Some Eurobonds have deferred-coupons (with initial interest capitalization for project finance); others have zero-coupon.
- About 65% of Eurobonds are issued by Governments or Govt. Agencies.
- A number of Indexes track the performance of Emerging Market debt, including:
  - J. P. Morgan Emerging Market Bond Indexes (EMBI).
  - Bradynet
  - Morgan Stanley MSCI Debt Indexes

# Procedures for New Eurobond Issues

Issuing an Eurobond normally follows the following procedures:

1. Initial discussion between the borrower and its banker to specify amounts, currency, target rate, inducements.
2. If agreed, the banker becomes the **Manager**.
3. The Manager invites several other banks to be **Co-managers** and form the **Management Group**, which negotiates the interest rates and other terms to be acceptable to target investors.
4. The Management Group and lawyers prepares a draft **Prospectus** and necessary legal documentation and obtain necessary clearances.
5. The Eurobond is normally listed in Luxembourg, or similar location where listing is cheap and where there is no prospects of withholding tax. This listing may be required by investors.
6. The Management Group issues invitation telexes to a larger number of institutions from different countries, to form the **Underwriting Group**, which will place the bonds in the sub-markets.

7. The members of the Underwriting Group agrees to commit themselves to purchase a share of the bonds at the set price.
8. A larger **Selling Group** is established, which includes the managers, underwriters, and other banks (which will try to sell the bonds but are not committed to purchase any).
9. The Eurobond is then widely announced along with its features and tentative terms.
10. The preliminary version of the Prospectus (called a “**Red Herring**”) will be used by the Selling Group to actively canvass the investing public for interest in the deal (**roadshows**).
11. Although the precise terms of the bond remains provisional until the official **Offering Date**, the Eurobonds may actually begin trading in a “when issued”, **Grey Market**.
12. After a few days or weeks of pre-placement and pre-marketing, the Management Group will return to the issuer with a commitment to the final terms.

13. When agreement is reached, the documents are formally signed on the **Offering Day**, at which time the Underwriters commits itself to purchasing the entire issue at the offering price minus the fees.
14. A final version of the Prospectus is printed and distributed and the Eurobonds are publicly offered (the **Primary Market**).
15. An important role of the Managers is Stabilization: to intervene in the market to support the price, both by direct participation (using their fees) and by adjusting the amounts allotted to the members of the selling group.
16. Two weeks after signing, on the **Closing Date**, the bonds are delivered to the buyers and the borrower receives the funds.
  - All this process can take from 3 weeks to 3 months.
  - The syndication fees include a management fee, an underwriting fee, and a selling fee.
  - The total one-time fee range from 0.5% of the issue for top firms to 2.5%.

## The Eurobond Secondary Market

- After the Closing Date of an Eurobonds issue, those of large and well-known borrowers are actively traded in a secondary market.
- For these bonds, two-way prices -- bid and offer -- are quoted by a number of market-maker banks in London and other financial centers.
- Bond yields are quoted in terms of yield-to-maturity, on an annual pay basis.
- Dollar denominated Eurobonds are quoted in relation to the spread of US Treasury bonds of comparable maturity.
- Some of the most active Eurobonds become “benchmark” Eurobonds used as key “indicators” for the pricing of other, comparable bonds.

## IV. Returns on EM Bonds

- The Yield-to-Maturity ( $y$ ) of a bond measures the rate of return anticipated by an investor who buys the bond, with a maturity value of  $M$ , at today's market price of  $P$  and holds it for  $n$  years until maturity. The bond may have an annual periodic payment of  $C$  (the Coupon).
- Example: A bond with a maturity (par) value of 100 euros pays an annual interest rate of 4%, or 4 euros per year. If the investor purchase the bond for 100 euros, the yield is 4%.
- But the market price ( $P$ ) of the bond could be 50 euros. The interest payment (the coupon) is still 4 euros per year. So for a 50 euro investment the investor can get a 4 euro annual payment, which is a return or "yield" of 8%.
- Market operators usually quote bond yields, rather than prices.
- The key thing to remember is that bad news drives down bond prices, which pushes up bond yields.

- The Yield-to-Maturity ( $y$ ) of a bond is obtained from the equation for the NPV of cash flows of the bond, given by:

$$P = \sum (C)/(1+y)^t + (M)/(1+y)^n$$

Where:

- P = Market Price of the Bond
- C = Periodic Coupon Payment
- M = Re-Payment of Bond at Maturity (Par Value)
- y = Bond's Yield-to-Maturity
- t = Time, from 1 to n
- n = Years to maturity

“ $y$ ” can be estimated by trial-and-error, and can be approximated by:

$$y \cong \frac{C + (M - P) / n}{(P + M) / 2}$$

- Yield equals the Annual Coupon  $C$  plus the bond's annual appreciation or depreciation  $(M-P)/n$ , divided by the average investment  $(P+M)/2$ .
- Example: A \$100 five-year bond with a 7% coupon and a price of \$90 would have a real yield by discounting is 9.6% . The approximate yield would be 9.5% =  $\{7+(100-90)/5\}/\{(100+90)/2\}$
- Note that “ $y$ ” and “ $P$ ” are inversely related: if  $y \uparrow$ , then always  $P \downarrow$

- A high yield implies a higher risk of default and lower bond price.

## Buying Bonds

- To buy a bond, for a given risk level and bond duration, an investor will buy one with the highest yield, which means the lowest price. This bond would be considered undervalued.
- But if the investor already own a bond (the annual coupon is already locked), the investor wants its yield to go down (and therefore its price to increase) by the time of future sale.

Example: I bought a \$100 zero-coupon bond with a 1 year maturity. Interest rates were 10% and I paid \$90.9 for it or ( $PV=100/1.10$ ). Then, interest rates drop to 7%. The market value of the bond is now higher ( $100/1.07$ ) or \$93.5. I made a \$2.6 profit (2.8% profit)

- Investors look at yields and their “spread” over a benchmark bond (for US-denominated bonds, the US Treasury bond of similar duration).

- To select which bonds to buy, investors spend considerable efforts comparing **bond spreads** with those of **similar-risk** eurobonds -- and with those of US high yield bonds (junk bonds) which are regarded as competitive securities – in order to identify undervalued bonds (with low market prices and high yields).
- If the spreads of a bond increases beyond its “natural, historical” level, then you can evaluate macro-economic factors to see the prospects that spreads may go down and prices will increase.
- If so, it may be a good time to buy it.

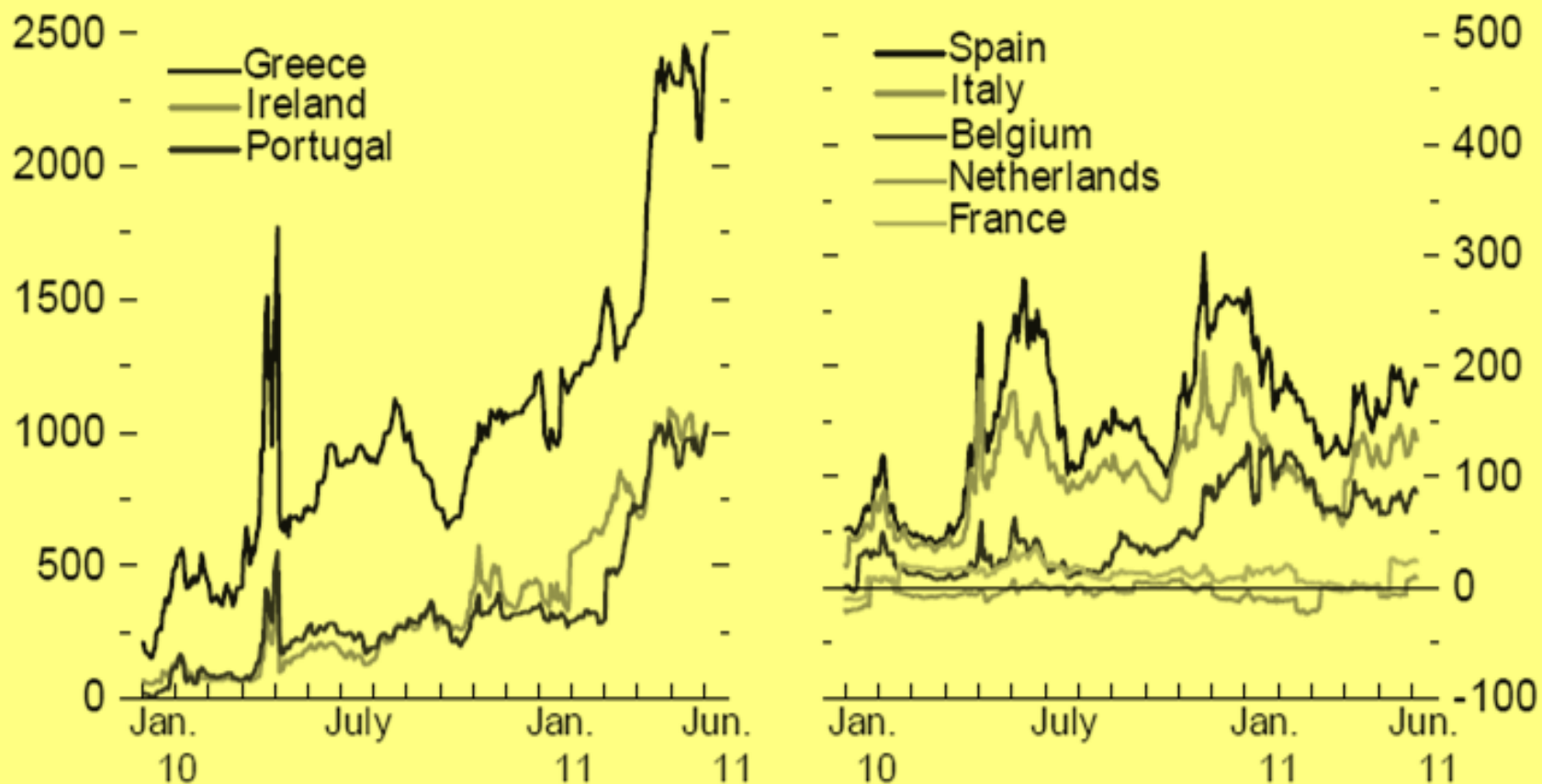
## **Current Bond Yield**

- This is another common yield calculation for bonds.
- It is the percentage rate of return of the coupon payments given a bond price above or below par value:  $Y_c = C / P$
- In the previous example, it would be:  $Y_c = 7 / 90 = 7.7\%$
- This is below the YTM of 9.6%, as this calculation ignores the bond maturity as it assumes that the bond will be held only one period (one year).

Higher yields imply that the market also envisages higher risks.

### Government Bond Spreads

(two-year yield spreads over German bunds, basis points)



# V. Measuring Returns: Bond Indexes

- The Emerging Markets Bond Indexes (EMBI) of J.P. Morgan are used extensively to track the performance of EM bonds.
- Except for the Euro EMBI, all indexes covers only US-dollar denominated and liquid traded securities.
- There are several such indexes:
  - EMBI                                      The first one introduced in 1991, with Bradies only (25 securities from 8 countries).
  - EMBI+                                     Bradies plus Eurobonds, traded loans and domestic dollar loans. 16 countries with 68 securities. Market capitalization of US\$125 billion, of which 60% are Brady bonds (US\$75 billion).
  - EMBI Global                             Coverage was increased in 1999. In 2010, it had 41 countries with Mkt capitalization of US\$300 billion.
  - Euro EMBI Global                     Covers Euro denominated eurobonds, with market capitalization of Euro 35 billion.

- The indexes reflects both interest income and price gains.
- Two indicators are used: (i) the Cumulative Total Return Index, and (ii) the Spread over US Treasury bonds.

### **(i) Calculation of Cumulative Total Return Index**

- For each bond, the total return is calculated on a cash-in/cash-out basis: what is paid at its initial purchase and what is received at its sale, including interest and amortization payments. Cash-ins are reinvested. The index is the weighted average based on market capitalization.

	<u>Index on</u> <u>31/3/01</u>	<u>Interest</u> <u>Return</u>	<u>Price</u> <u>Return</u>	<u>Total</u> <u>Return</u>	<u>Index on</u> <u>30/4/01</u>
EMBI Global	200.8	0.8	-1.3	-0.5	199.8 (200.8x0.995)
Argentina	176.5	1.1	-4.5	-3.4	170.5 (176.5x0.966)
Brazil	222.9	0.8	-1.9	-1.1	220.4 (222.9x0.989)
Colombia	126.7	0.8	-0.4	0.4	127.2 (126.7x1.004)
Mexico	195.8	0.7	-0.1	0.6	197.1
Nigeria	302.6	0.7	1.8	2.5	310.2
Peru	261.1	0.7	-12.1	-11.4	231.2
Russia	181.2	1.1	2.2	3.3	186.9
Turkey	131.4	0.9	7.4	8.3	142.3

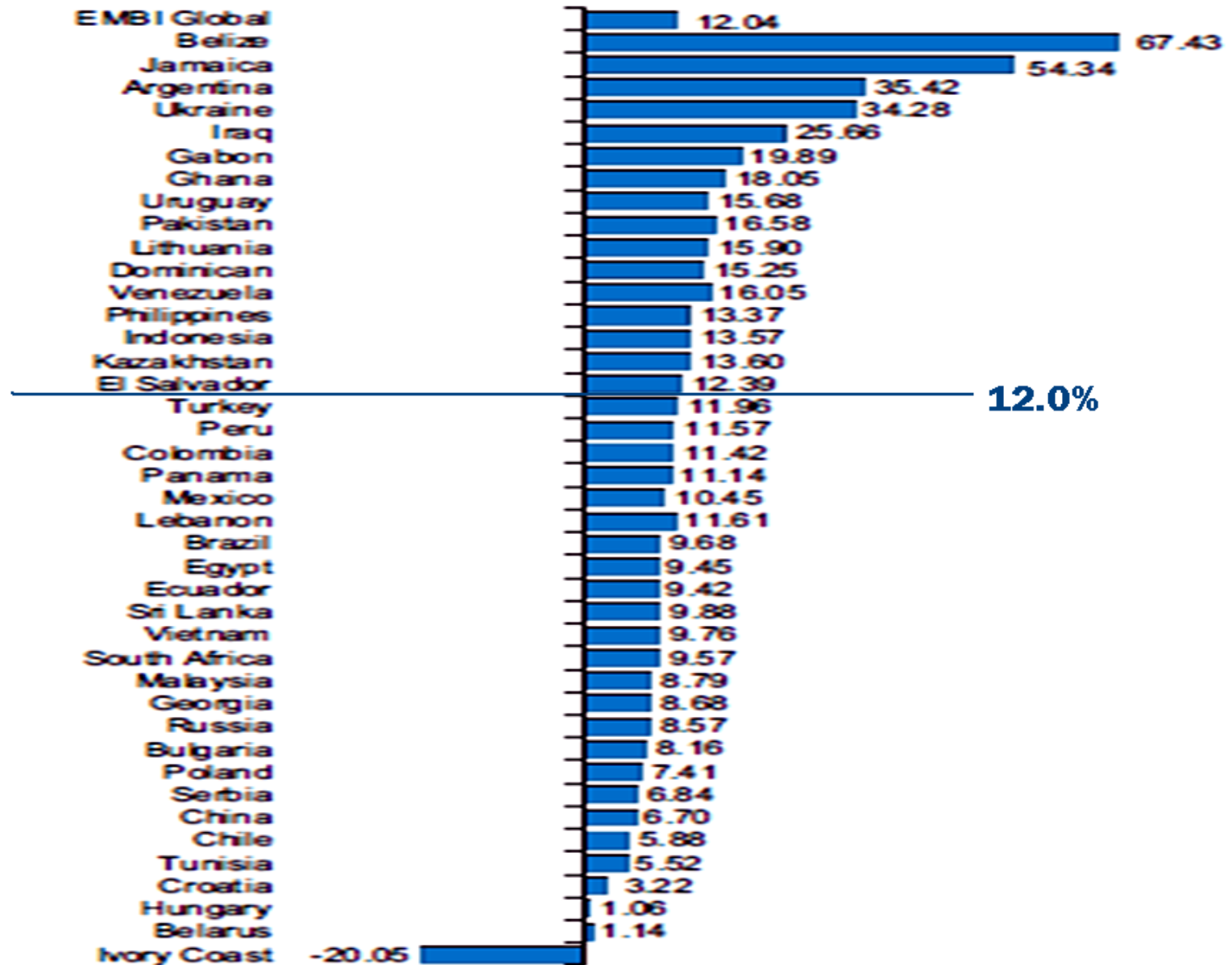
- The performance of EM bonds in the last few years has been as follows  
**EMBI Global, Total Return in % - Interest Rate plus**

**Annual Price Appreciation**

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
All EM countries	13.1	25.7	11.7	10.7	9.9	6.3	-10.9	28.2	12.0
Africa	12.6	22.0	8.1	9.2	4.2	8.4	-3.5	25.2	7.0
Asia	14.5	8.6	5.2	10.1	11.6	6.1	-5.6	32.5	12.4
Europe	27.8	15.0	7.3	9.6	5.6	7.9	-18.2	30.3	9.5
Middle East	14.1	19.5	9.9	9.8	2.2	10.5	-20.0	28.7	11.5
Latin America	6.8	33.0	13.4	10.9	11.9	5.1	-11.1	23.6	20.1
US 10-year T-yield	3.8	4.2	4.2	4.4	3.1	9.2	22.0	-11.1	8.5
Dow Jones Ind	-16.8	25.0	3.1	-0.6	14.7	5.5	-33.8	18.8	11.0
S&P 500	-23.4	26.4	9.0	3.0	13.6	3.5	-38.5	23.4	12.8
MSCI (eq) in EMs	-8.0	51.2	22.4	30.3	32.6	33.5	-54.4	74.1	16.3

# EMBI Global Returns in 2010:

## 2010 EMBIG - Total Returns (%)



# EMBI Global – % Total Return

## Best Performers

2010

1.	Belize	67%
2.	Jamaica	54%
3.	Argentina	35%
4.	Ukraine	34%
5.	Iraq	25%

2009

1.	Pakistan	147%
2.	Argentina	132%
3.	Ecuador	118%
4.	Ukraine	99%
5.	Iraq	96%

2008

1.	China	8%
2.	Brazil	6%
3.	Lebanon	5%
4.	Chile	5%
5.	Egypt	4%

## Worse Performers:

2010

1.	Cote D'Ivory	-20%
2.	Belarus	1%
3.	Hungary	1%
4.	Croatia	3%
5.	Tunisia	5%

2009

1.	China	8%
2.	Brazil	11%
3.	Poland	12%
4.	Egypt	12%
5.	Mexico	12%

2008

1.	Ecuador	-73%
2.	Argentina	-58%
3.	Ukraine	-54%
4.	Pakistan	-49%
5.	Venezuela	-40%

## (ii) Calculation of the Spread over Benchmarks - US T-bonds

- Given an EM bond and a date, all future cashflows are worked out.
- The sum of all the cashflows are discounted at an **arbitrary yield** to obtain the present value (PV) of the bond.
- The yield is adjusted so that the PV matches the current market price of the bond. **This is the yield-to-maturity (y) of the bond.**
- Now, given the benchmark (i.e. an interest rate spot curve for the US Treasury curve obtained by interpolating US notes and bonds with different maturities), the spread of the EM bond is calculated as follows:
  - The PV of the EM bond is calculated by discounting each cashflow at the **benchmark yield** with the same tenor plus a constant spread.
  - **The constant spread is adjusted such that the PV matches the bond market price.**
  - **This is the spread for the EM bond.**
- To calculate the spread of the index, a big cash flow is created that is the sum of all the bonds in the index weighted by market capitalization. Then the same procedure described above is used.

Example:

	Period 1			Period 2		
	<u>Price</u>	<u>YTM</u>	<u>Spread</u>	<u>Price</u>	<u>YTM</u>	<u>Spread</u>
US Bond	95	5.3%	-	98	2.0%	-
EM Bond	90	11.1%	580 bps	88	13.6%	1,160 bps

- Consider two zero-coupon bonds with 1-year maturity and that the market prices are \$95 for the US bond, and \$90 and for the EM bond.
- That means that the yield-to-maturity of the US bond is 5.3% [ $y=(100/95)-1$ ], while the YTM of the EM bond is 11.1%.
- With the US bond as benchmark, the spread is the difference of YTM, which is 580 bps (assuming that the benchmark yield curve is just constant at 5.3%).
- Suppose that suddenly the price of the US bond jumps to \$98 and that the price of the EM bond goes down to \$88.
- The YTM will change to 2% and 13.6% respectively, with a spread of 1160 bps. The spread of the EM bond is now higher. Investing in the US bond would have represented a gain of 3.2%, while investing in the EM bond would have produced a loss of 2.2%.
- So, even though the EM bond always had a positive spread over the US bond, because the EM bond spread increased over the period (e.g., the EM bond price declined), investing in the US bond will give a higher return than investing in the EM bond.

## EMBI Global – Sovereign Spreads: YTM over US Treasuries (in basis points)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>EMBI G</b>	<b>994</b>	<b>708</b>	<b>797</b>	<b>727</b>	<b>533</b>	<b>423</b>	<b>306</b>	<b>198</b>	<b>197</b>	<b>406</b>	<b>472</b>	<b>301</b>
<b>EM-Lat America</b>	<b>845</b>	<b>665</b>	<b>867</b>	<b>965</b>	<b>700</b>	<b>527</b>	<b>364</b>	<b>213</b>	<b>208</b>	<b>427</b>	<b>510</b>	<b>360</b>
<b>EM - Asia</b>	<b>278</b>	<b>294</b>	<b>328</b>	<b>257</b>	<b>245</b>	<b>265</b>	<b>265</b>	<b>180</b>	<b>161</b>	<b>356</b>	<b>374</b>	<b>206</b>
<b>EM- Europe</b>	<b>2050</b>	<b>1024</b>	<b>836</b>	<b>516</b>	<b>348</b>	<b>275</b>	<b>185</b>	<b>149</b>	<b>158</b>	<b>370</b>	<b>449</b>	<b>247</b>

## VI. Risks in EM Bonds

The risk of EM bonds is a function of their exposure to a number of factors:

- (i) **Interest Rate Risk**, risk of capital loss due to fluctuations in interest rates.
- (ii) **Default Risk**, risk due to the possibility that the borrower will not pay the principal or interest when due.
- (iii) **Sovereign Risk**, the risk that the country will not honor contractual obligations concerning its debt.
- (iv) **Liquidity Risk**, the risk that the bond can not be sold readily at a price close to the current price.
- (v) **Agency-type Risk**, risk that the value of the bond may decline due to actions taken by the issuer.
- (vi) **Foreign Exchange Risk**, risk from changes in exchange rates for bonds in foreign currency.

In EM bonds, default risks & sovereign risk are called “**Country Risk**”.

- Portfolio managers must decide on the level of exposure to these risk factors and choose bonds that give the required level of exposure in a cost-effective way.
- Compared to equity, bond returns for a similar risk class (default risk) tend to be more highly correlated with one another (say, all AA rated bonds). Therefore, diversification is less important than in equities.
- It is therefore possible to concentrate a portfolio in “best-value” bonds: deciding which bond to hold (based on its return/risk profile) is more important.
- Bond Indexes such as EMBI Global track the risks on bonds on the basis of the Volatility of Total Returns (standard deviations) for periods of 1 month, 3 months and 12 months.

## Interest Rate Risk and Duration

- For bond market participants who buy a bond, collect the coupon and **hold it to maturity**, market volatility is irrelevant; principal and interest are received according to a pre-determined schedule.
- But participants who buy and **sell bonds before maturity** are exposed to many risks, most importantly changes in interest rates.
- When interest rates increase, the value of existing bonds fall, since new issues pay a higher yield.
- Likewise, when interest rates decrease, the value of existing bonds rise, since new issues pay a lower yield.
- This is the fundamental concept of bond market volatility: **changes in bond prices are inverse to changes in interest rates.**
- Fluctuating interest rates are caused in part by a country's monetary policy and bond market volatility is a response to expected monetary policy and economic changes.

- **Interest rate risk** is the risk of loss of principal capital due to changes in the general level of interest rates (such as for a benchmark bond as US T-bonds).
- **If interest rates increases, price bonds will decline.**
- **But for the same interest rate increase, bonds with longer maturities and later repayments will experience larger declines in bond prices.**
- In these bonds more future cash flows will be discounted at high rates.
- **Duration** is a measure of the **average life of a bond**, taking into account the timing of the bond's cash flows (coupon payments/repayments).
- It is calculated as the weighted average of the present value of the bond's cash flows, where the weighting factor is the time at which the cash flow is to be received. In a "bullet" bond with a zero-coupon, duration will be equal to its maturity.
- A bond with periodic equal coupon payments and one single repayment at maturity will have a duration less than its maturity.
- A bond with equal coupons and equal principal repayments would have a duration which is close to half the maturity of the bond.

- The formula for Duration for a bond with equal coupons (C), with a maturity of “t”, and full repayment (M) at maturity, is:

$$D = \frac{\sum t (C)/(1+y)^t + n (M)/(1+y)^n}{P_0} = \frac{\sum t (C)/(1+y)^t + n (M)/(1+y)^n}{\sum (C)/(1+y)^t + (M)/(1+y)^n}$$

- Note that the denominator is the expression for the current bond price.
- Example: If  $y = 5\%$ , a \$100 three-year bond with a 5% coupon payment and a single repayment at maturity will have a duration of 2.86 years:

$$D = \frac{(1 \times 5)/(1.05) + (2 \times 5)/(1.05)^2 + (3 \times 5)/(1.05)^3 + (3 \times 100)/(1.05)^3}{5/(1.05) + 5/(1.05)^2 + 5/(1.05)^3 + 100/(1.05)^3} = \frac{286}{100}$$

- Bonds with longer **duration** experience higher interest rate risks.
- **A bond portfolio whose overall position is not affected by interest rate changes is called “immunized”**: this could be achieved in two forms:
  - (1) The duration of bond asset holdings is offset by a similar duration on equal liabilities (obtained through hedging); and
  - (2) In order to have “immunity” by the end of a planning period (say 10 years), combine various bonds to produce a similar duration (say, of 10 years.) The effect is similar to holding the bonds to maturity.

- For many Bond Managers, another important measure of risk is the volatility of the “tracking error” of the portfolio.
- The “tracking error” is the difference in the rate of return of the portfolio held by the manager and a “benchmark” portfolio (such as EMBI Global), usually prescribed by the plan sponsor or investor.

## Bond Volatility to Interest Rate Changes.

- The response (volatility) of bond prices to changes in interest rates depends on its duration. In fact, another expression for duration is the **elasticity of bond prices to interest rates**:

$$D = - \frac{dP/P}{d(1+y)/(1+y)} = - \frac{dP/P}{d(1+y)} (1+y) = - V (1+y) \quad \text{or} \quad \mathbf{V = - D / (1+y)}$$

- Where V (Volatility) is the % change in bond price resulting from a change in interest rates of 1 percentage-point (ie, from 5% to 6%).
- In the previous example, volatility would be  $- 2.86/(1.05) = - 2.7\%$
- An increase in “y” to 6% would drop the bond price by 2.7% to \$97.3

## VII. Measuring Risks: Bond Ratings

- To assess Country Risk, many purchasers of Eurobonds rely on the general reputation of the issuing borrower and its underwriters.
- As more new borrowers entered the market, there was a need for bond-rating services that would “measure” their creditworthiness.
- The rating agencies Standard & Poor’s (S&P’s) and Moody’s account for most of the ratings, normally providing ratings for a fee.
- Their evaluations are limited to the issuer’s ability to obtain the necessary currency to repay the issue according to the original terms of the bond (default and sovereign risks).
- It involves analyzing country **economic** and **political** risks as well as **corporate** risks.
- The review of **economic** risks for a country is based on debt burden, international liquidity, balance of payments flexibility, economic structure, economic growth performance, economic management and economic outlook (Country Ec Management Class).

- A 1997 study in the New York Fed showed that GDP growth, per-capital GDP, inflation, debt stock and default history explained more than 90% of cross-country variations in ratings.
- These variables are heavily affected by economic policies, particularly fiscal, monetary and business climate policies.
- The review of **political** risks includes an assessment of the government system, the social environment and the country's external relations.
- **Corporate** risk is assessed based on financial statements and other company information provided by the borrower and obtained by the rating agencies.
- The evaluation excludes any assessment of profit/loss risk to the investor caused by changing exchange rates.
- Based on preliminary information, a preliminary rating is made. The issuer is given the opportunity to comment.
- After the final rating is made, the issuer may decide not to have the rating published, if it believes the rating would be damaging. This produces a bias on published ratings.

# S&P's   Moody's   Definition.

## Upper Investment Grade:

AAA	Aaa	Strongest capacity to pay.
AA(+,-)	Aa2(1,3)	Strong capacity to pay, but less than AAA.
A(+,-)	A2(1,3)	Strong capacity to pay, but susceptible to adverse effects.

## Lower Investment Grade:

BBB(+,-)	Baa2(1,3)	Adequate capacity to pay, but adverse economic conditions are likely to lead to weakened capacity.
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## Non-Investment Grade:

BB(+,-)	Ba2(1,3)	Speculative elements with respect to capacity to pay, but at lowest degree. Debt service is not fully assured.
B(+,-)	B2(1,3)	Speculative & undesirable for investment.
CCC(+,-)	Caa2(1,3)	High degrees of speculation, with strong default risk.
CC - C	Ca - C	Highest degree of speculation with eminent default.

## Default

D, SD	D	Debt in Default, Selective Default
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- Ratings at or above “BBB-” are Investment Grade.
- Many institutional and other investors have authority to invest only in “investment-grade” issues (which are included in some benchmark investment-grade indexes -- such as Lehman Brothers and Salomon Smith Barney).
- Other investors must invest the largest share of their portfolio (say 70%) in investment grade securities, but can invest shares in non-investment grade securities (say, 20% in BB and 10% in B).
- But even though non-investment grade securities can be part of portfolios, they are not “core” investment (they are ex-index), and can be dropped easily at the discretion of the portfolio manager.
- Investment grade securities are “core”, and managers must justify their exclusion from the portfolio.
- Having an investment grade, therefore, increases not only the bond price, but also the demand and stability of the security.

# Key Factors in Sovereign Credit Rating Assessments

Fitch	Macroeconomic policies, performance, and prospects; structural features of the economy; public finances; external finances
Moody's	Economic strength; institutional strength; financial strength of the government; susceptibility to event risk
Standard & Poor's	Political risk; economic structure; economic growth prospects; fiscal flexibility; general government debt burden; offshore and contingent liabilities; monetary flexibility; external liquidity; external debt burden

Sources: Fitch (2010a); Moody's (2008); and Standard and Poor's (2008).

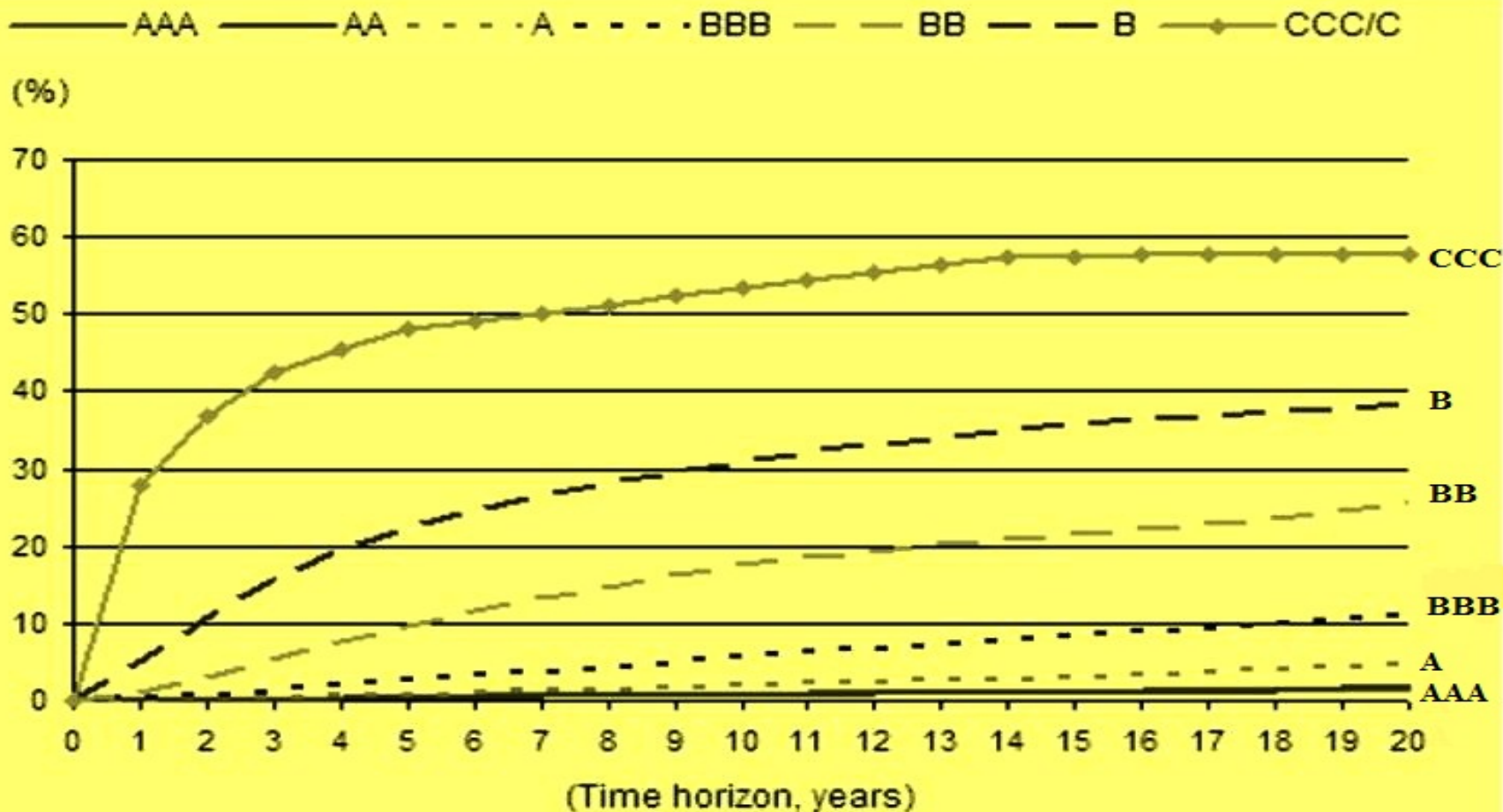
# Ratings of EM Government Eurobonds, January 2011

<u>Country</u>	<u>S&amp;P's Rating</u>		<u>Country</u>	<u>S&amp;P's Rating</u>	
Slovenia	AA	(from AA-)	Egypt	BB+	
Taiwan	AA-		Macedonia	BB+	
China	AA-	(from A+)	Colombia	BB+	
Chile	A+		Romania	BB+	(from BBB-)
Slovakia	A+		Latvia	BB+	(from A-)
Estonia	A		Philippines	BB	
South Korea	A		Turkey	BB	
Czech Rep	A		Indonesia	BB	(from B+)
Malaysia	A-	(from BBB)	Uruguay	BB	
Poland	A-	(from BBB+)	Serbia	BB-	
South Africa	BBB+		Venezuela	BB-	(from B+)
Thailand	BBB+		Ukraine	B+	(from CCC+)
Lithuania	BBB	(from A-)	Georgia	B+	
Russia	BBB	(from BBB+)	Sri-Lanka	B+	
Bulgaria	BBB		Argentina	B	(from B+)
Mexico	BBB		Bolivia	B	
Kazakhstan	BBB		Dominican R	B	
Hungary	BBB-	(from A-)	Pakistan	B-	
India	BBB-	(from BB+)	Ecuador	B-	(from CCC+)
Croatia	BBB-				
Brazil	BBB-	(from BB)			
Peru	BBB-	(from BB+)			

# Default Rates for All Government Bonds

- Historically, Government bonds rated as investment-grade have experienced very low default rates.
- From 1975 to 2010, the 15-year cumulative default rate for sovereigns rated in investment grade was 1.02%.
- The cumulative default rate was 0.00% for sovereigns rated in the 'A' category or higher.
- During this period, 97.78% of sovereigns rated 'AAA' at the beginning of the year retained their rating at the end of the year.

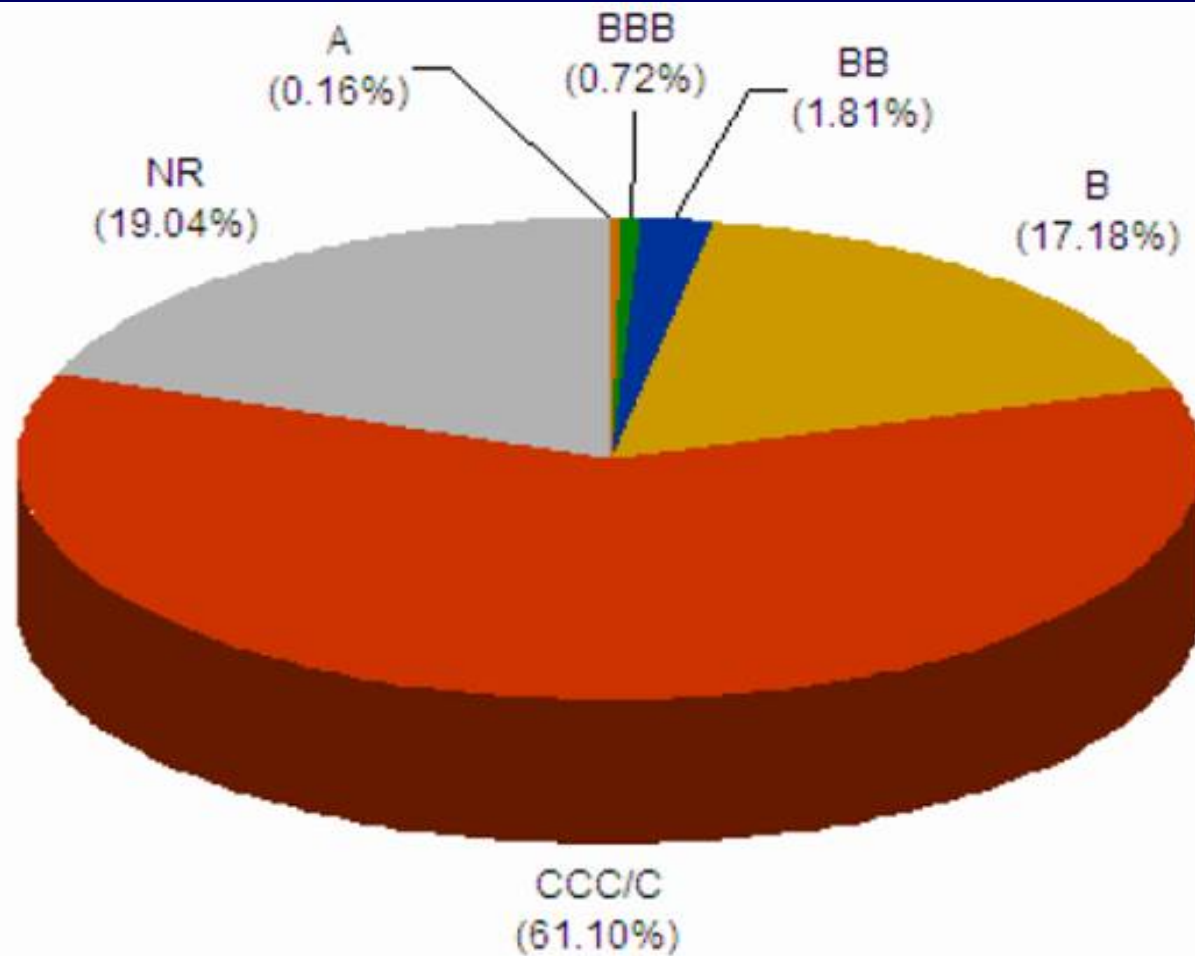
# Global Corporate Bonds: Average Cumulative Default Rates by Rating (1981-2009)



Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

© Standard & Poor's 2010.

# Global Corporate Bonds: Default Distribution by Rating prior to “D” (1981-2009)



Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

© Standard & Poor's 2010.

## Global Corporate Default Rates By Rating, Average for 1981-2009

	<u>1982-2009</u>	<u>2009</u>
• AAA	0.00%	0.00%
• AA	0.02%	0.00%
• A	0.07%	0.39%
• BBB	0.27%	0.18%
• BB	0.90%	1.02%
• B +	2.55%	5.48%
• B	7.37%	9.96%
• B -	10.23%	17.16%
• CCC/C	23.61%	48.42%

If your corporate bond defaults,  
how much will you get back?

<u>Defaulted Instrument</u>	<u>Mean Recovery</u>
Bonds	
Sr. Secured	54%
Sr. Unsecured	44%
Sr. Subordinated	29%
Subordinated	12%
Bank Loan	78%
Preferred Stock	1%

# Five-Year Default Rates: Corporate Vs Government

## Long-Term Senior Debt Rating Symbols

Interpretation	Fitch and S&P	Moody's	Moody's Five-Year Default Rates (1983–2009) (in percent)		
			Idealized	Corporate	Sovereign
Highest quality	AAA	Aaa	0.003	0.086	
High quality	AA+	Aa1	0.031		
	AA	Aa2	0.068		
	AA-	Aa3	0.142	0.247	
Strong payment capacity	A+	A1	0.261		
	A	A2	0.467		
	A-	A3	0.730	0.806	0.000
Adequate payment capacity	BBB+	Baa1	1.100		
	BBB	Baa2	1.580		
	BBB-	Baa3	3.050	2.027	2.437
Likely to fulfill obligations, ongoing uncertainty	BB+	Ba1	5.280		
	BB	Ba2	8.410		
	BB-	Ba3	11.860	11.444	8.079
High-risk obligations	B+	B1	16.120		
	B	B2	20.710		
	B-	B3	27.050	26.240	10.572
Vulnerable to default	CCC+	Caa1	36.314		
	CCC	Caa2	48.750		
	CCC-	Caa3	69.821		
Near or in bankruptcy or default	CC	Ca			
	C	C		52.350	32.458
	D	D			

Sources: Fitch; Moody's; and Standard & Poor's.

# Default Risk Protection

## Credit Default Swaps (CDS)

- CDS were created by J.P. Morgan in 1995 and have become the major credit derivative, with over \$50 trillion of CDS outstanding in the over-the-counter market, up from \$29 trillion in December 2006 and \$14 trillion in December 2005 (BIS).
- A CDS contract is a credit derivative under which one party (the protection seller) agrees to pay a “premium” to the counterparty (the protection buyer) if a particular debtor (the reference entity) experiences any one of a number of defined credit default events that indicate it is unable or may be unable to service its debts.
- For buyers of credit protection, the CDS market offers the opportunity to reduce credit concentration and regulatory capital while maintaining customer relationships.
- For sellers of protection, it offers the opportunity to take credit exposure over a customised term and earn income without having to fund the position.
- Typically a CDS contract is for five years, but could be shorter or longer up to 10 years.

## ...Credit Default Swaps (CDS)

- The protection seller receives a CDS premium, typically expressed as a per annum percentage in basis points (e.g., 300 basis points) of the notional value of the reference obligation (the amount of coverage).
- This premium is paid quarterly or semi-annually until either the maturity date of the contract or the occurrence of a credit event.
- Under most conditions, this CDS premium should reflect but be lower than the credit spread of the bond of the same maturity (the yield of the bond minus the risk-free rate for Treasury bonds of similar maturity).
- This is because a holder of a security protected by a CDS will have a risk somewhat similar – but higher -- to the risk of a free-risk security.
- In fact, the CDS contract takes away many but not all the risks of the security compared to a risk-free security.
- Empirical work shows that the CDS premium trend to vary in parallel but more widely than the spread of the security itself.
- CDS premiums typically decline when creditworthiness improves, and rise when it worsens (as is the case with the bond spread). But these premium movements are amplified compared to the bond spreads.
- Therefore someone who believes that a company's credit quality would change could potentially profit much more from investing in CDS swaps than in the underlying bonds (although having a greater loss risk).

## ...Credit Default Swaps (CDS)

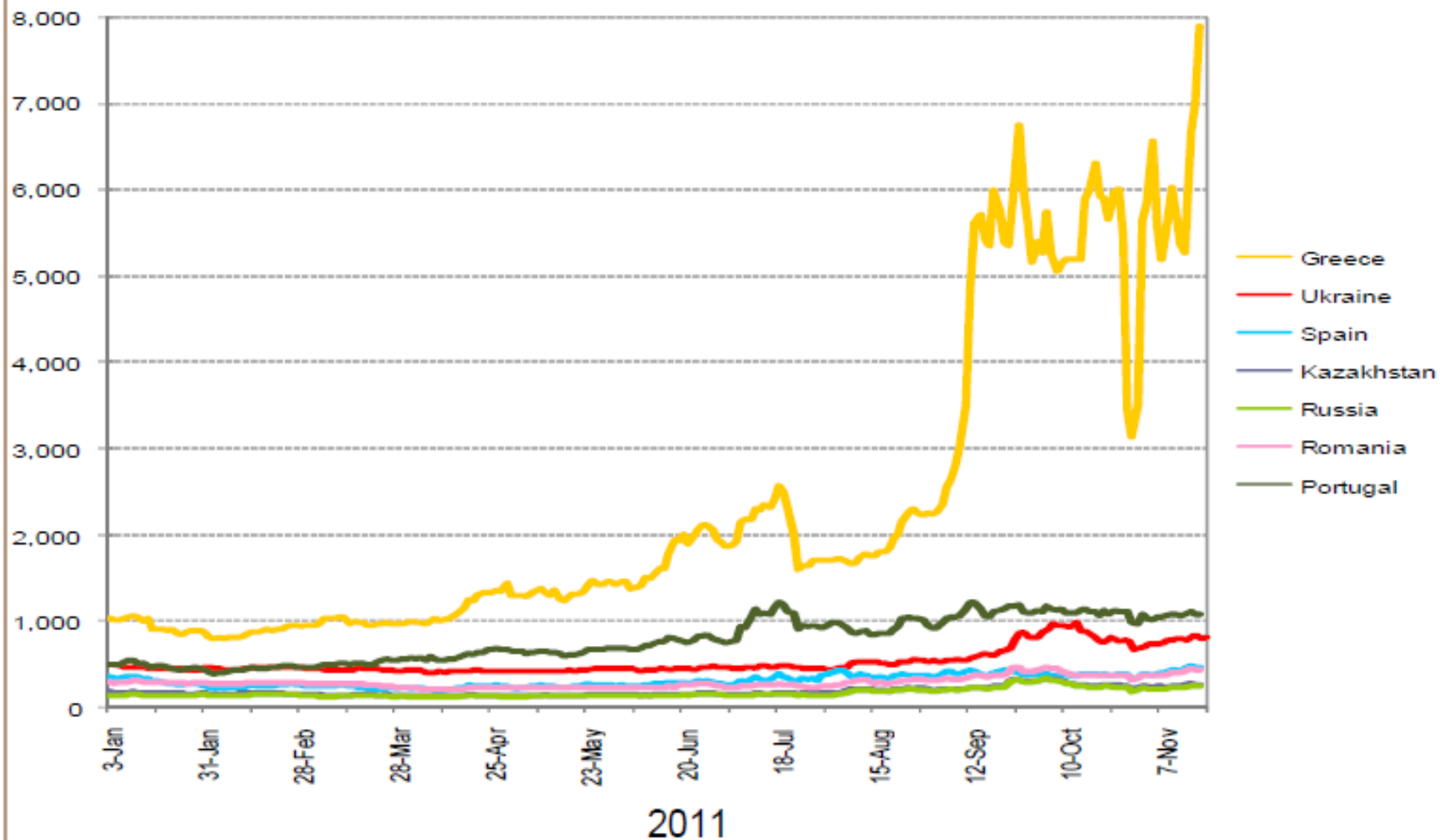
- **For example:** A UK Lending Bank owns \$10 million worth of a five-year bond issued by Risky Corporation in Ukraine.
- In order to manage the risk of losing money if Risky Corporation defaults, the UK Lending Bank buys a CDS from UK Derivative Bank in an amount of \$10 million that trades at 300 basis points.
- In return for this credit protection, the UK Lending Bank pays 3% of 10 million (\$300,000) in quarterly installments of \$75,000 to the UK Derivative Bank.
- If Risky Corporation does not default on its bond payments, the UK Lending Bank makes payments to UK Derivative Bank for 5 years and receives its \$10 million loan back after 5 years from Risky Corp.
- Though the protection payments reduce investment returns for the pension fund, its risk of loss in a default scenario is reduced.
- If Risky Corporation defaults on its debt 3 years into the CDS contract, the UK Lending Bank would stop paying the quarterly premium, and UK Derivative Bank would ensure that the UK Lending Bank is refunded for its loss of \$10 million (either by taking physical delivery of the defaulted bond for \$10 million or by cash settling the difference between par and recovery value of the bond).

## **Sovereign 5Y CDS (as of Jan 2010)**

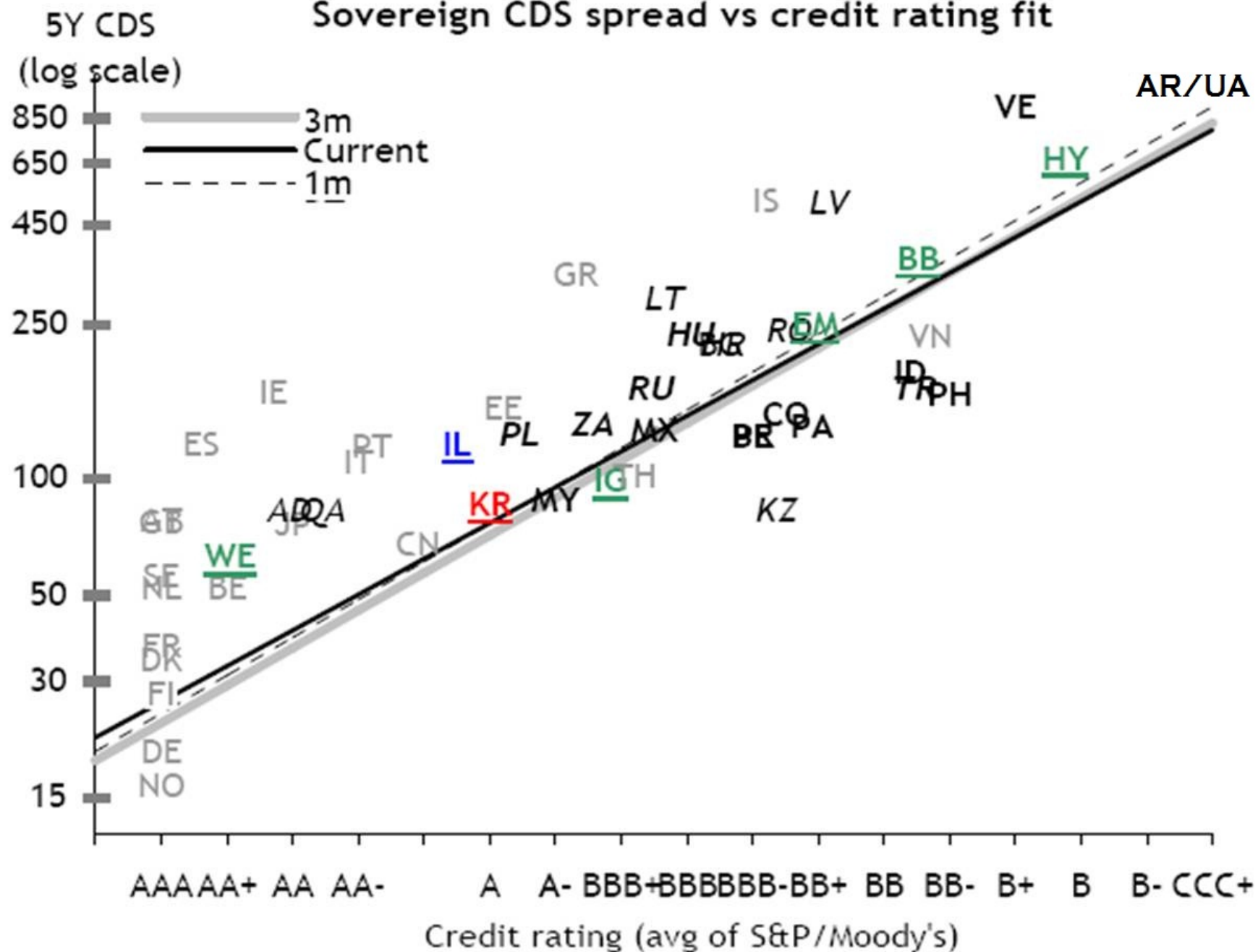
• China	<b>67</b>	• Russia	<b>170</b>
• Korea	<b>85</b>	• Turkey	<b>170</b>
• Malaysia	<b>87</b>	• Indonesia	<b>187</b>
• Thailand	<b>100</b>	• Croatia	<b>220</b>
• Israel	<b>122</b>	• Bulgaria	<b>220</b>
• Peru	<b>127</b>	• Vietnam	<b>230</b>
• Brazil	<b>127</b>	• Hungary	<b>232</b>
• Poland	<b>129</b>	• Romania	<b>240</b>
• Mexico	<b>132</b>	• Lithuania	<b>290</b>
• Panama	<b>135</b>	• Latvia	<b>512</b>
• South Africa	<b>136</b>	• Iceland	<b>518</b>
• Colombia	<b>145</b>	• Venezuela	<b>900</b>
• Estonia	<b>150</b>	• Ukraine	<b>965</b>
• Philippines	<b>164</b>	• Argentina	<b>1005</b>

Source : J.P.Morgan, Jan 2010

## Credit Default Swaps



# Sovereign CDS spread vs credit rating fit



# Spreads: BBB companies raise money more cheaply than BB or B rated companies



## Bond Returns and Bond Risks

The spreads of the **EM Government bonds** included in the EMBI Global compared to US Treasury bonds have fluctuated widely between risk categories and over time as follows:

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2006</u>	<u>2007</u>
Invest. Grades	382	178	329	260	272	247	101	162
BB	818	441	724	692	490	415	176	271
B	1231	672	923	883	1236	1007	238	473
Residual	3784	2282	1684	3169	3555	2495	858	771

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 Total Returns of the EMBI Global were as follows:

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2006</u>	<u>2007</u>
Invest. Grades	-4.6	10.8	11.4	13.8	15.1	2.6	5.5	6.9
BB	-6.9	13.0	7.8	9.5	3.8	7.2	12.6	5.6
B	-37.7	37.3	11.2	0	35.8	11.8	20.6	1.2
Residual	-20.7	99.4	48.8	-13.3	-2.6	11.1	-6.1	36.1

- The average spread for the EMBI Global was 295 basis points in December 2009, down from 685 bps in December 2008.
- The average spreads for different EM risks have been approximately as follows (based on EMBI Global and S&P's ratings):

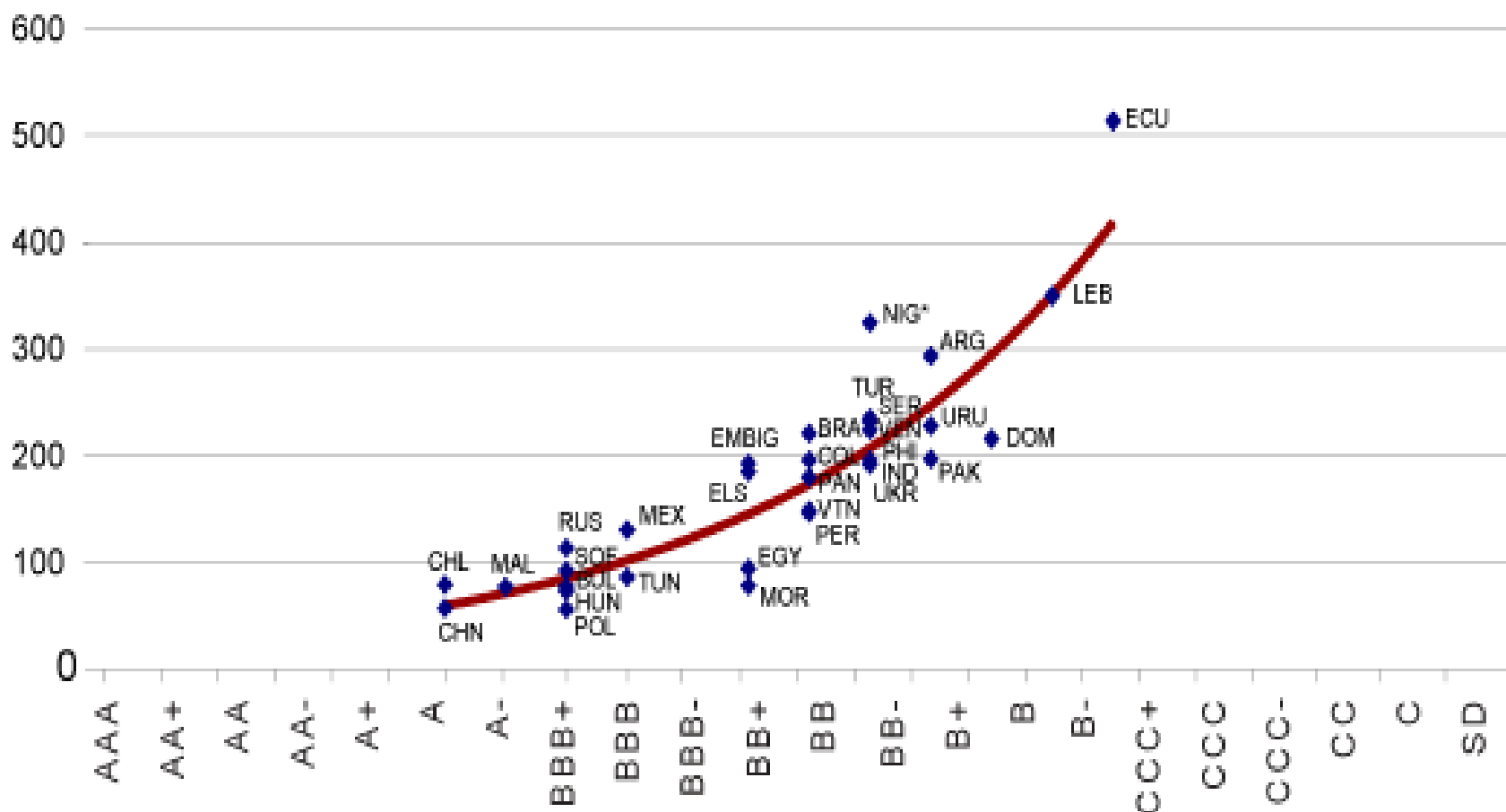
<u>Rating</u>	<u>Spread over USTry</u>	<u>Default Probability (1)</u>
A	50-150 bps	1.3% (based on spread of 120 bps)
BBB	100-300 bps	2.4% (based on 190 bps spread)
BB	300-500 bps	5.1% (based on 350 bps spread)
B	500-800 bps	9.0% (based on 580 bps spread)
CCC	800-3,000 bps	21.0% (based on 1,300 bps spread)

- Up to 2008, spread compressed due in part to better macroeconomic performance in most Emerging Markets and also due to Western investors appetite for EM bonds in their drive to seek greater returns in EMs. This drove EM bond prices up and spreads down.
- More recently, after September 2008, due to the international crisis, the spreads over US Treasuries of EM bonds have increased.

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 (1) Default Probability over 5 years (Hull, J., M. Predescu, and A. White, “The Relationship Between Credit Default Swap Spreads, Bond Yields, and Credit Rating Announcements” *Journal of Banking and Finance*, 2004.

# JPMorgan EMBIG Index As Of Oct. 31, 2006

(Spread over UST)

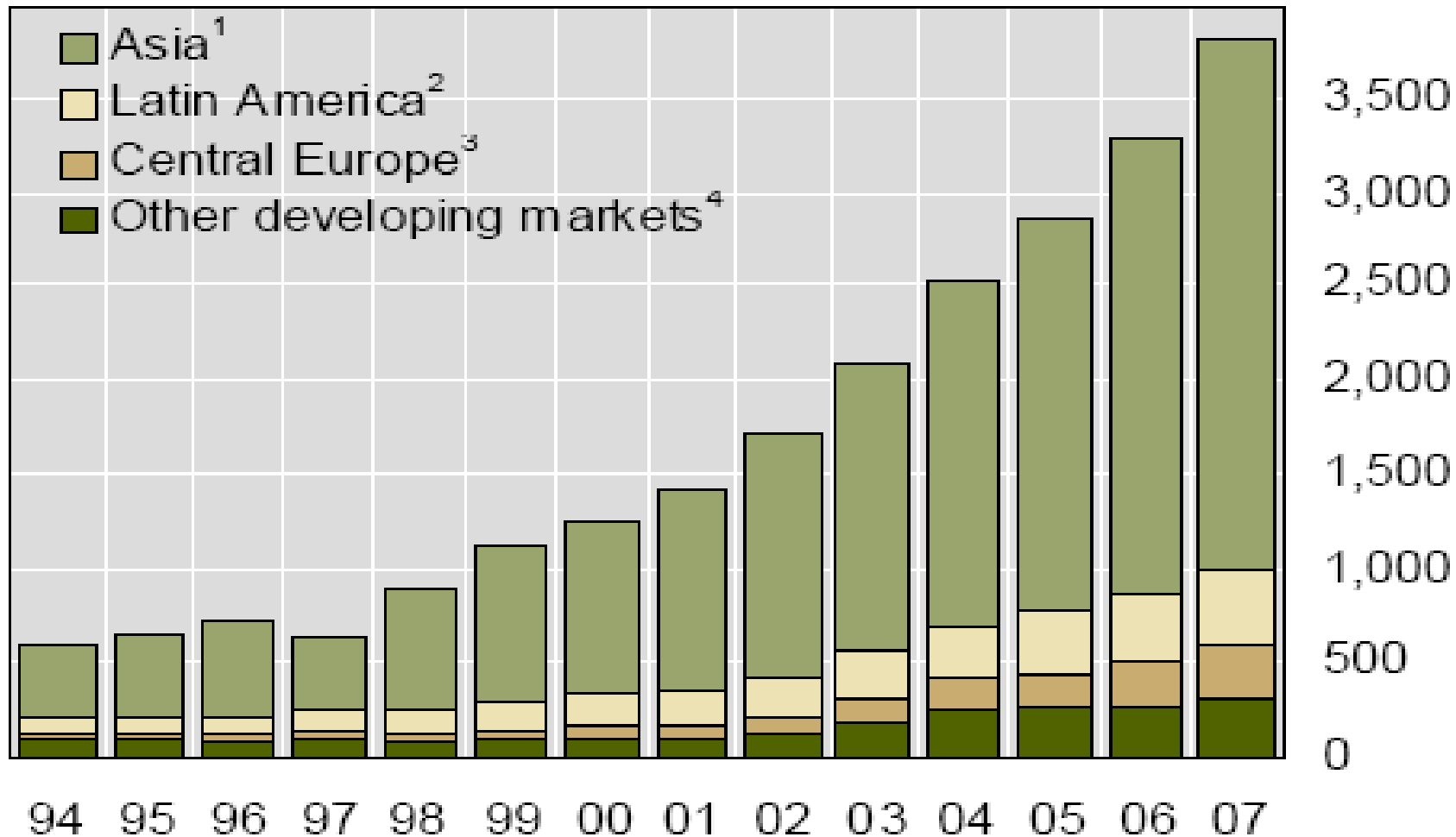


## VIII. Local Government Bond Markets

- The severity of the recent financial crises (Mexico, Asia, Russia) has highlighted the risks of contracting debt in foreign currencies.
- Many EM countries have stimulated the development of local bond markets in local currency, improving transparency and predictability and opening them to foreign investors.
- EM Domestic Debt is now the fastest growing security markets in the world: For 15 major EM countries, the outstanding value of domestic debt securities increased to \$3,800 billion in 2007 compared to \$2,100 billion in 2003 and \$600 million in 1995.
- In Asia, local bonds have been issued to retire foreign debt, bail out failing banks, and carry out corporate restructuring.
- J.P. Morgan has developed the Emerging Local Markets Bond Index (+), tracking short-maturity bonds in 20 EMs.

# Domestic Bond Markets have Boomed

(Outstanding Value of Local Bonds of 15 largest EM Issuers, in US billion)



## EMs with largest Local Bond Markets

Total Amounts Outstanding, March 2011 (in US\$ billion)

<u>Country</u>	<u>Total Local Bonds</u>	<u>Government</u>
<u>Local Bonds</u>		
1. China	3048	1500
2. Brazil	1527	980
3. Korea	1175	122
4. India	711	610
5. Malaysia	278	131
6. Turkey	232	229
7. Poland	230	220
8. Thailand	228	165

Source: Bank of International Settlements, November 2011

# Local Government Bond Index-Emerging Markets GBI-EM

- International investors are looking more closely at local government bond markets in search for higher yields and greater diversification.
- In 2005, JPMorgan launched the Government Bond Index-Emerging Markets (**GBI-EM**) to track the performance of local currency bonds issued by 13 EM governments.
- The **GBI-EM GLOBAL** index was launched in November 2006, with more diversification (17 countries) and including only those countries that are directly accessible by most international investors (excludes countries with capital controls such as China and India).
- For 2010, JPMorgan forecasts that GBI-EM will yield a total return in local currencies of 2.7%. With many local currencies expected to appreciate against the dollar on an average by 9.7%, the total return in US dollars is expected to be 12.6% ( $1.027 \times 1.097$ )
- The best performing GBIs are expected to be Poland (22.9%, 4.2% local + 17.9% appreciation), followed by Turkey (17%), Hungary (13%), Russian (13%), and Egypt (11%).

# Strategic Steps to Develop a Govt Bond Market:

## A. Fiscal and Monetary Policies

- Control fiscal budget deficits and establish adequate forecasting facilities for Government revenues and expenditures.
- Phase out direct Government control over interest rates, deposits and loans
- Design central bank operations (liquidity management) to stimulate interbank transactions in government bonds.

## B. Improve Market Access and Bond Issuance

- Establish a strong commitment to move towards market-base government financing through bills and bonds sold at market prices. Dismantle captive sources of funds.
- Develop appropriate Government debt management and governance structures, stating responsibilities of debt managers, and providing appropriate operational capacity, professional staff, incentives and accountability.

- Develop a sound overall risk and cash management framework.
- Develop efficient bond distribution channels (auction mechanisms, underwriters), including use of information technology.
- Start with simple bond instruments with conventional maturities.
- Establish buy-backs.

### **C. Develop an Investor Base for Govt Bond**

- Develop an investor base by reforming the pension system into a fully funded system, promoting investment funds specializing in Government securities, and encouraging new market-makers.
- Liberalizing contractual savings and insurance schemes (based on sound prospectuses).
- Improve information and disclosure requirements for institutional investors.
- Improve supervision and regulation of financial institutions.
- Examine capital account restrictions and consider liberalization.

- Introduce certification standards for investment advisors.

## **D. Develop Secondary Market Structures for Govt Bonds**

- Facilitate development of automated trading systems, trading in derivatives.
- Facilitate the emergence of organized trading facilities and interdealer brokers.
- Promote prudent regulations governing trading practices.
- Promote development of professional associations.

## **E. Improve Securities Clearance and Settlement**

- Establish payment and settlement procedures for cash and securities, including dematerialized account for securities.
- Develop reliable Depository arrangements to record ownership and settlement of securities.
- Establish security settlements with DVP (Delivery-Vs-Payment).

## **F. Improve the Legal and Regulatory Framework**

- Develop a sound legal framework for Securities.
- Improve enforcement of securities laws.
- Ensure the legal protection of investors.
- Set standards for auditing and accounting.
- Strengthen securities prudential supervision and enforcement.

## **G. Adjust Tax Policy to Facilitate Bonds**

- Adopt a tax policy that treats earnings in Government securities at comparable rates as other income.
- Eliminate taxes on security trading.
- Establish sunset clauses for tax incentives on bond income

(The IMF and World Bank are quite active in assisting EMs in this area (for elaboration on the above steps see “Government Bond Markets: A Handbook”, World Bank, Washington DC, 2001).

## IX. EM Access to International Debt

- Banks would normally advise an EM country, which is contemplating entering international debt obligations, to plan for a gradual introduction, based on easy of access to the various markets.
- A typical sequence of access would be as follows:
  - (1) A Eurocredit, based on promissory notes with a single institution.
  - (2) Syndication through FRNs, based on marketable securities.
  - (3) A Foreign Bond, in a neighboring, sympathetic country, such as a Yankee bond for Mexico, a Samurai bond for China, a German bond for Poland, etc.
  - (4) Issuance of Commercial Paper in the US, with the guarantee of an irrevocable stand-by line of credit from a prime US bank.

- (5) A Euronote issue, with a NIF or RUF.
- (6) Convertible or Indexed Eurobond
- (7) Eurobond with warrants
- (8) Country Funds
- (9) Straight Eurobonds

In addition, some of the instruments can be enhanced to increase attractiveness. For example, a FRN can be linked to an interest rate swap to convert it into a fixed rate obligation.

# X. Bond Portfolio Strategies

An investor in International bonds could follow a Passive or Active Management Strategy.

## Passive Portfolio Management

- In a passive approach the portfolio manager uses an EM bond index, such as the EMBI Global.
- The index would contain the major EM securities, weighed by market capitalization.
- This approach works well in developed economies (as predicted by the CAPM, such index would be optimum and would be located at the efficient frontier).
- However, given that international security markets are not fully integrated, several studies have shown that an international index is not located at the efficient frontier, though it yields higher return/risk combinations than purely domestic portfolios.

- An international portfolio manager that wishes to follow a passive approach will need to introduce some judgment in selecting various -- not all -- groups or categories of securities to be included in her index.
- This selection of groups could be based on factors that define the degree of integration with the rest of the world, such as size of companies, maturities, type of borrower, degree of bond liquidity, transparency of information, etc.
- Despite its technical problems, the great advantage of passive bond management is retaining the benefits of international diversification, while reducing transaction costs.
- A passive management strategy may include “immunization”. That is, construct the portfolio so that the bond values are in line with the value of liabilities (such as through cash-flow matching).

# Active Portfolio Management

- An active portfolio management requires knowledge of the markets as well as ability to forecast economic conditions, including foreign exchange currency rates and interest rates.
- Historically, all bonds issued in a given currency behave similarly. This suggest a top-down currency approach. The major determinant of performance is caused by the selection of the currency.
- The desirability of currency hedging should also be considered. Studies have shown that currency hedging in international bond portfolios increased the value of the portfolio (despite that Foreign Exchange Parity Relations would indicate that differences in interest rates would compensate for changes in exchange rates ).
- A second major determinant of portfolio performance is the evolution of interest rates in that EM country.

- Investment banks have developed a number of approaches to forecast interest rates in Emerging Markets.
- Goldman Sachs' uses econometrics to forecast real interest rates in EMs. Combined with inflation forecast, it can produce forecasts of nominal interest rates. In Goldman Sachs model, real interest rates in EMs are a function of the following dependent variables:
  - (1) The global real interest rate, measured by real interest rates in the G-7.
  - (2) The rate of return on capital, measured by corporate profits to capital stock in enterprise sector. Economic reforms (such as liberalization) affect the rate of return.
  - (3) Financial risk premia, measured by the ratios of public debt to GDP and current account deficits to GDP.
  - (4) A number of bond market pressure indicators, including inflation rates, fiscal deficits, economic activity and political risks.

- The building of a bond portfolio can be broken down into three steps:
- (1) **Portfolio analysis and Valuation:** analysis of the current composition of the portfolio and the risks that it faces. Breakdown by currency, type of borrower, maturity, credit ratings, duration, yield-to-maturity, etc. The analysis is linked to a valuation system.
  - (2) **Strategic analysis:** The strategic analysis is based on forecast scenarios of currency rates and interest rates. It would involve simulating the effects of exchange rates and interest rates on the value of the portfolio. This simulation would also suggest which securities to sell and which to buy, given the forecasted scenarios.
  - (3) **Bond Selection:** Valuation techniques are used to detect the cheapest (underpriced) bonds to buy. Spread analysis is used to assess the relative values of similar securities (the spreads in yield-to-maturity are compared daily and actions are taken when the spread goes significantly above its average.) Other techniques are used to add value to the basic strategy, including derivatives use.

Financial Times: [www.ft.com](http://www.ft.com); markets; markets data; data archive;  
select category: bonds & rates; select a report: high yield and emerging markets bonds.

<b>BONDS - HIGH YIELD &amp; EMERGING MARKET</b>										
Nov 5	Red date	Coupon	Ratings			Bid price	Bid yield	Day's chge yield	Mth's chge yield	Spread vs US
			S*	M*	F*					
<b>High Yield US\$</b>										
HSBK Europe	05/13	7.75	B+	Ba2	B+	105.95	5.19	-0.05	0.39	4.88
Kazkommerts Int Bertin	04/14	7.88	B	Ba3	B-	96.28	9.17	0.06	-0.37	8.38
	10/16	10.25	NR	B1	-	110.75	7.93	-0.03	0.17	6.56
<b>High Yield Euro</b>										
Royal Carib Crs	01/14	5.63	BB-	Ba3	-	100.85	5.32	0.02	-1.10	4.16
Kazkommerts Int	02/17	6.88	B	B2	B-	91.18	8.75	-	-0.18	6.91
<b>Emerging US\$</b>										
Bulgaria	01/15	8.25	BBB			120.00	3.11	-0.30	-0.55	2.02
Peru	02/15	9.88	BBB-	Baa3	BBB-	130.50	2.28	-0.11	-0.45	1.19
Brazil	03/15	7.88	BBB-	Baa3	BBB-	124.38	1.97	-0.17	-0.59	0.88
Mexico	09/16	11.38	BBB	Baa1	BBB	146.63	2.70	0.01	-0.19	1.61
Argentina	01/17	11.38	D	Ca	WD	32.50	43.38	0.23	-0.61	41.64
Philippines	01/19	9.88	BB-	Ba3	BB	143.81	3.63	-0.10	-0.13	1.87
Brazil	01/20	12.75	BBB-	Baa3	BBB-	172.63	3.45	0.01	-0.21	0.91
Colombia	02/20	11.75	BBB-	Ba1	BB+	161.00	3.87	-0.04	-0.38	1.33
Russia	03/30	7.50	BBB	Baa1	BBB	121.38	4.04	0.01	-0.26	2.27
Mexico	08/31	8.30	BBB	Baa1	BBB	145.75	4.80	-0.05	-0.22	0.67
Indonesia	02/37	6.63	BB	Ba2	BB+	121.75	5.11	-0.04	-0.08	0.99
<b>Emerging Euro</b>										
Brazil	02/15	7.38	BBB-	Baa3	BBB-	117.50	2.92	0.05	0.06	1.59
Poland	02/16	3.63	A-	A2	A-	103.18	2.96	0.10	0.07	1.40
Turkey	03/16	5.00		Ba2	BB+	106.25	3.68	-0.08	-0.42	2.13
Mexico	02/20	5.50	BBB	Baa1	BBB	109.50	4.24	-0.03	-0.17	1.90

US \$ denominated bonds NY close; all other London close. \*S - Standard & Poor's, M - Moody's, F - Fitch.  
Source: ThomsonReuters

# Which bond offers best value?

- Highest spread is Argentina 01/17 at 41.64% but is in D (default)
- Best quality is Poland (A-), but spread is only 1.40%
- Longest maturity is Indonesia 2/37 (BB) but spread only 0.99%
- Currency makes a difference too: Kazkommerts pays more for a shorter maturity in dollars than it does in euros.
- Is Russia better value than Mexico? Russian spread over US Treasuries is 2.27% compared with just 0.67% for Mexico, despite identical credit ratings and similar maturities.
- Yet Mexico in euros pays a spread of 1.90% for a bond over eleven years shorter than the Mexican dollar issue.

Based on this information an Emerging Markets Bond Portfolio could have the following composition, including 5 bonds for diversification:

- 20% in Argentina 01/17 (D in \$)-- to go for gains as Argentina improves
- 20% in Kazkommertz 04/14 ( B in \$) -- also for yield, more secured
- 20% in Royal Carib 1/14 (BB in euro) -- yield and currency diversific.
- 20% in Russia 03/30 (BBB in \$) -- best spread for a BBB
- 20% in Mexico 02/20 (BBB in euro) -- for currency diversification

# Yields for Government Bonds of Developed Countries (FT)

## BONDS - BENCHMARK GOVERNMENT

	Red		Bid	Bid	Day chg	Wk chg
Nov 3	Date	Coupon	Price	Yield	yield	yield
Australia	11/12	4.75	99.53	5.00	0.11	-0.01
	04/20	4.50	94.47	5.25	0.03	0.01
Austria	07/12	5.00	106.36	1.16	-0.03	-0.06
	07/20	3.90	108.56	2.87	-0.03	-0.03
Belgium	03/12	2.00	100.93	1.32	0.10	0.07
	09/20	3.75	103.94	3.28	-0.02	-0.02
Canada	12/12	1.50	100.14	1.43	0.02	0.00
	06/20	3.50	105.20	2.87	0.04	0.05
Denmark	11/12	4.00	105.45	1.25	0.02	-0.02
	11/19	4.00	111.42	2.57	-0.03	-0.06
Finland	09/12	4.25	105.86	1.04	-0.04	-0.05
	04/20	3.38	106.03	2.64	-0.07	-0.12
France	09/12	0.75	99.33	1.11	-0.08	-0.01
	07/15	2.00	100.68	1.85	-0.02	-0.03
	10/20	2.50	97.01	2.85	-0.03	0.02
	04/41	4.50	123.50	3.27	-0.07	-0.09
Germany	09/12	0.75	99.62	0.96	-0.03	-0.06
	10/15	1.75	100.60	1.62	-0.06	-0.10
	09/20	2.25	98.57	2.42	-0.06	-0.10
	07/40	4.75	136.50	2.90	-0.08	-0.13
Greece	05/13	4.60	84.28	12.16	0.28	2.44
	06/20	6.25	72.76	10.94	0.14	1.18
Ireland	01/14	4.00	94.17	6.06	0.26	1.17
	10/20	5.00	82.37	7.59	0.36	1.10
Italy	07/12	2.50	100.85	1.98	0.03	0.14
	06/15	3.00	100.41	2.93	0.04	0.19
	09/20	4.00	100.99	3.92	0.01	0.11
	09/40	5.00	104.71	4.76	-0.04	0.07

Japan	11/12	0.10	99.93	0.14	-	-0.01
	09/15	0.30	100.00	0.30	0.00	0.01
	09/20	0.80	98.69	0.95	0.00	0.04
	09/30	1.80	100.15	1.79	-0.03	0.04
Netherlands	07/12	5.00	106.60	1.02	-0.03	-0.04
	07/20	3.50	107.11	2.66	-0.03	-0.07
New Zealand	04/13	6.50	105.39	4.16	0.02	0.20
	05/21	6.00	105.27	5.34	0.03	0.20
Norway	05/15	5.00	111.30	2.33	0.00	-0.24
	05/21	3.75	104.37	3.25	-0.01	-0.23
Portugal	06/12	5.00	102.01	3.67	0.32	0.64
	06/20	4.80	88.95	6.37	0.20	0.68
Spain	04/12	2.75	100.97	2.07	0.09	0.19
	10/20	4.85	104.21	4.32	0.07	0.24
Sweden	10/12	5.50	107.74	1.38	-0.01	-0.09
	12/20	5.00	119.47	2.76	-0.05	-0.05
Switzerland	02/13	4.00	107.80	0.52	0.01	-0.04
	04/21	2.00	104.91	1.49	-0.02	-0.10
UK	12/11	3.25	102.83	0.64	-0.02	-0.07
	01/15	2.75	104.75	1.58	-0.03	-0.04
	03/20	4.75	114.16	3.00	-0.05	-0.06
	09/39	4.25	102.68	4.09	-0.03	-0.02
US	10/12	0.38	100.09	0.33	-0.01	-0.06
	10/15	1.25	100.72	1.10	-0.07	-0.14
	08/20	2.63	100.42	2.58	-0.06	-0.06
	08/40	3.88	96.81	4.06	0.04	0.07

London close.

Source: FT

Yields: Local market standard Annualised yield basis. Yields shown for Italy exclude tax at 12.5 per cent payable by non residents.

## Spreads for 10-yr Govt Bonds of Developed Countries (FT)

# BONDS - TEN YEAR GOV'T SPREADS

	Bid	Spread	Spread		Bid	Spread	Spread
Nov 5	Yield	vs	vs		Yield	vs	vs
		Bund	T-Bonds			Bund	T-Bonds
Australia	5.30	+2.87	+2.75	Netherlands	2.65	+0.22	+0.10
Austria	2.88	+0.46	+0.34	New Zealand	5.33	+2.91	+2.79
Belgium	3.30	+0.88	+0.76	Portugal	6.72	+4.30	+4.18
Canada	2.85	+0.43	+0.31	Spain	4.38	+1.96	+1.84
Denmark	2.54	+0.12	+0.00	Sweden	2.72	+0.29	+0.17
Finland	2.66	+0.24	+0.12	Switzerland	1.48	-0.95	-1.07
France	2.86	+0.44	+0.32	UK	2.98	+0.55	+0.43
Germany	2.42	-	-0.12	US	2.54	+0.12	-
Greece	11.57	+9.15	+9.03				
Ireland	7.82	+5.40	+5.28				
Italy	3.94	+1.52	+1.40				
Japan	0.93	-1.49	-1.61				

Yields: annualised basis. Source: Thomson Reuters Selection made by Thomson Reuters.

# Bond Investment by Individuals

- Individual investors normally do not have the skills or the time to do the analysis required to build successfully an bond portfolio.
- But Investment companies allow individual investors the ability to participate in the bond markets through bond funds, closed-end funds and unit-investment trusts.
- In 2006 in the US, total bond fund net inflows increased 97% from \$30.8 billion in 2005 to \$60.8 billion in 2006.
- Exchange-traded funds (ETFs) are another alternative to trading or investing directly in a bond issue.
- These securities also allow individual investors the ability to overcome large initial and incremental trading sizes.