Evolution of the Fixed Income Market
Finance 472: Trading & Markets

September 10, 2004

Deutsche Bank Securities Inc., a subsidiary of Deutsche Bank AG, conducts investment banking and securities activities in the United States.
Contents

Section
1  Unsecured Debt and Swap Market
2  Development of Mortgage and Asset Backed Securities
3  Issuer Case Study: Capital One
Unsecured Debt and Swap Market

Section 1
“Neither a borrower,

nor a lender be. . . ”

--Polonius, to his son Laertes, in Hamlet
What is Debt Capital Markets?

- Envision the corporate balance sheet. Specialist bankers are responsible for covering each component of a corporate balance sheet. In addition to delivering their own specialties, these bankers also work together to deliver multi-disciplinary solutions that encompass more than one section of the balance sheet.

\[
\text{Assets} = \text{Liabilities} + \text{Shareholders’ Equity}
\]

- The debt originators are responsible for underwriting transactions with their client base in a broad range of currencies: USD, EUR, GBP, JPY and AUD, as well as smaller ones.

- The risk marketers -- all highly specialized -- focus separately on interest rate, currency, commodity and credit risk.
The Capital Markets process of matching investors with issuers requires intricate coordination between various parts of an investment bank.

Key Players in the Origination, Sales and Trading of Corporate Debt

Issuers

Debt originators

DCM

Syndicate

Credit Trading

Cash bond traders

Credit default swap traders

Credit Research

Sales

Investors

Interest rate swap traders

Treasury traders

Interest Rate Trading
Treasury Yield Curve

Yield Curve as of 9/7/04

<table>
<thead>
<tr>
<th>Investment Period</th>
<th>Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 month</td>
<td>1.62%</td>
</tr>
<tr>
<td>6 month</td>
<td>1.88%</td>
</tr>
<tr>
<td>1 year</td>
<td>2.11%</td>
</tr>
<tr>
<td>2 year</td>
<td>2.56%</td>
</tr>
<tr>
<td>3 year</td>
<td>2.89%</td>
</tr>
<tr>
<td>5 year</td>
<td>3.46%</td>
</tr>
<tr>
<td>10 year</td>
<td>4.24%</td>
</tr>
<tr>
<td>30 year</td>
<td>5.01%</td>
</tr>
</tbody>
</table>
Interest rates have fallen dramatically over the last 20 years. The principal reason for this secular decline in rates has been a precipitous decline in inflation. In recent years, a decline to new lows in rates has been driven by the 2001-2002 recession and accommodating Fed monetary policy.
Credit Spreads Relative to Treasuries

High-quality corporate bonds are quoted as basis point spreads to Treasuries. The basis point spreads equate to incremental yield for the greater credit risk of a corporate bond versus a Treasury bond.

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Corporate credit spreads are theoretically driven by the probability of default (failure by the borrower to pay principal or interest) and the anticipated recovery of principal (as a % of par) if there is a default.
Corporate Credit Spreads
Closer Look

Corporate Yield = Treasury Yield + Corporate Spread (bps)

= Treasury Yield + (Amortization of implicit premium generated by writing puts on the equity of the specific company)

- Corporate bond investor accepts risks that equity cushion (SE = Assets minus Liabilities) will decline or even become negative (leading to an event of default)

- Equity volatility (both company-specific and in index form, as expressed by the VIX) influences corporate spreads as well. Low volatility translates into low implicit option premium and tight corporate spreads. Conversely, high volatility leads to high premium and wide spreads.

- Capital structure arbitrageurs look to profit from discrepancies in valuation of different layers of a given company’s capital structure.
**Historical Credit Spreads**

- **Spread Compression**: Periods of low volatility are typically accompanied by small spread increments for differing levels of credit risk.
- **Spread Decompression**: Periods of high volatility typically see much greater spread increments for the same differences in risk.

Stock market bubble bursts, economy goes into recession, default frequency accelerates.

**Asian crisis**

Russian debt default/LTCM

US economy begins to recover; assets reflate.

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Issuance volume has multiplied as funding cost became cheaper.

### Historical US Investment Grade and High Yield Issuance

- **$ Billions**
- **%**

**Historical Overview**

- **1984**
- **1985**
- **1986**
- **1987**
- **1988**
- **1989**
- **1990**
- **1991**
- **1992**
- **1993**
- **1994**
- **1995**
- **1996**
- **1997**
- **1998**
- **1999**
- **2000**
- **2001**
- **2002**
- **2003**
- **2004 YTD**

**Data Key**

- **Inv. Grade (LHS)**
- **High Yield (LHS)**
- **10y Treasury Note (RHS)**

**Legend**

- Down arrows for Rates
- Up arrows for Issuance Volume

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**Deutsche Bank**
Historical Default Rates

Global Corporate Bond Default Counts & Dollar Volumes, 1982-2003

Recessions lead to sharp increases in default frequencies.

After prolonged periods of economic growth, lax underwriting standards and/or investor avarice can exacerbate the pressures of economic weakness.

Source: Moody's Investor Services

Oops! Corporate bonds actually do carry principal risk!
### Historical Default Migration

#### Average One-Year Ratings Transition Matrix: 1920-2002

<table>
<thead>
<tr>
<th>Ratings From</th>
<th>Aaa</th>
<th>Aa</th>
<th>A</th>
<th>Baa</th>
<th>Ba</th>
<th>B</th>
<th>Caa-C</th>
<th>Default</th>
<th>WR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa</td>
<td>88.37%</td>
<td>6.31%</td>
<td>0.96%</td>
<td>0.20%</td>
<td>0.01%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>4.15%</td>
</tr>
<tr>
<td>Aa</td>
<td>1.17%</td>
<td>86.99%</td>
<td>5.75%</td>
<td>0.63%</td>
<td>0.15%</td>
<td>0.02%</td>
<td>0.00%</td>
<td>0.07%</td>
<td>5.21%</td>
</tr>
<tr>
<td>A</td>
<td>0.07%</td>
<td>2.36%</td>
<td>86.09%</td>
<td>4.78%</td>
<td>0.62%</td>
<td>0.10%</td>
<td>0.02%</td>
<td>0.12%</td>
<td>5.82%</td>
</tr>
<tr>
<td>Baa</td>
<td>0.04%</td>
<td>0.25%</td>
<td>3.92%</td>
<td>82.66%</td>
<td>4.72%</td>
<td>0.65%</td>
<td>0.09%</td>
<td>0.29%</td>
<td>7.38%</td>
</tr>
<tr>
<td>Ba</td>
<td>0.01%</td>
<td>0.08%</td>
<td>0.42%</td>
<td>4.76%</td>
<td>78.41%</td>
<td>5.38%</td>
<td>0.50%</td>
<td>1.11%</td>
<td>9.33%</td>
</tr>
<tr>
<td>B</td>
<td>0.00%</td>
<td>0.04%</td>
<td>0.14%</td>
<td>0.56%</td>
<td>5.86%</td>
<td>75.99%</td>
<td>3.22%</td>
<td>3.67%</td>
<td>10.52%</td>
</tr>
<tr>
<td>Caa-C</td>
<td>0.00%</td>
<td>0.02%</td>
<td>0.03%</td>
<td>0.32%</td>
<td>1.21%</td>
<td>4.59%</td>
<td>71.72%</td>
<td>13.27%</td>
<td>8.84%</td>
</tr>
</tbody>
</table>

#### Average Cumulative Credit Loss Rates from 1 – 5 years (1982 – 2003)

<table>
<thead>
<tr>
<th>Ratings To:</th>
<th>1yr</th>
<th>2yr</th>
<th>3yr</th>
<th>4yr</th>
<th>5yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.03%</td>
</tr>
<tr>
<td>Aa</td>
<td>-</td>
<td>0.00%</td>
<td>0.03%</td>
<td>0.08%</td>
<td>0.14%</td>
</tr>
<tr>
<td>A</td>
<td>0.01%</td>
<td>0.05%</td>
<td>0.14%</td>
<td>0.24%</td>
<td>0.34%</td>
</tr>
<tr>
<td>Baa</td>
<td>0.15%</td>
<td>0.40%</td>
<td>0.69%</td>
<td>1.13%</td>
<td>1.55%</td>
</tr>
<tr>
<td>Ba</td>
<td>0.88%</td>
<td>2.50%</td>
<td>4.49%</td>
<td>6.56%</td>
<td>8.59%</td>
</tr>
<tr>
<td>B</td>
<td>4.19%</td>
<td>9.75%</td>
<td>15.12%</td>
<td>20.37%</td>
<td>25.27%</td>
</tr>
<tr>
<td>Caa-C</td>
<td>17.14%</td>
<td>30.91%</td>
<td>44.84%</td>
<td>55.91%</td>
<td>66.80%</td>
</tr>
</tbody>
</table>

Source: Moody’s Investor Services
Corporate Debt Issuance—Sellers (“Issuers”)

Examples

**Auto (Captive Finance)**
- Ford Motor Co.
- General Motors
- American Honda

**Telecom/Media/Technology**
- AT&T
- Motorola
- IBM

**Consumer/Retail**
- Anheuser-Busch
- Wal-Mart
- Procter & Gamble

**Financials**
- Citigroup
- Washington Mutual Bank
- Allstate

**Industrial**
- General Electric
- Caterpillar
- John Deere

**Healthcare**
- GlaxoSmithKline
- Pfizer

**Energy/Power**
- Con Edison of New York
- Pacific Gas and Electric

**Other**
- FedEx
- Berkshire Hathaway

**Sovereign/Supranationals**
- Republic of Philippines
- International Finance Corp.
### Sample Buyers of Corporate Debt

- **Asset Managers:** Blackrock, PIMCO, WAMCO, etc.
- **Banks:** Bank of New York, Citibank, HSBC, etc.
- **Corporates:** Caterpillar Investment Management, Fannie Mae, Microsoft, etc.
- **Hedge funds:** BlueBay, SAC Capital, Solent, etc.
- **Insurance Companies:** Aegon, AIG, Northwestern Mutual Life, etc.
- **Mutual Funds:** Dreyfus, Fidelity, Vanguard, etc.
- **Pension Funds:** General Electric Pension Fund, Teachers Insurance & Annuity Assoc., etc.
- **State Fund:** Alabama State Fund, California PERS, Maryland State Retirement and Pension System, etc.
Evolution of the European Corporate Credit Market

Recent issuance growth among European A/BBB rated entities has outpaced AAA/AA rated issuers.

The “institutionalization” of European money management has turned credit into an asset class.

Arrival of Monetary Union created a single-currency euro-denominated credit market to rival the US market.

“Belgian dentist” buys individual bonds from highly-rated, highly recognized companies like Siemens, BT, GE, and Ford.

Historical European Investment Grade and High Yield Issuance

Year

$ Billions


AAA/AA  A/BBB  High Yield
# Largest Debt Transactions in History

The largest capital-raising initiatives ever have occurred in the unsecured debt market. Deals in bold indicate Deutsche Bank served as Bookrunner.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Date</th>
<th>Issuer</th>
<th>Size</th>
<th>Currencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>June 2003</td>
<td>General Motors/GMAC</td>
<td>$17.5 Bn</td>
<td>USS, Euro, GBP</td>
</tr>
<tr>
<td>2</td>
<td>March 2001</td>
<td>France Telecom</td>
<td>$16.4 Bn</td>
<td>US$, Euro, GBP</td>
</tr>
<tr>
<td>3</td>
<td>June 2000</td>
<td>Deutsche Telecom</td>
<td>$14.6 Bn</td>
<td>USS, Euro, GBP, JPY</td>
</tr>
<tr>
<td>4</td>
<td>May 2001</td>
<td>WorldCom</td>
<td>$11.9 Bn</td>
<td>US$, Euro, GBP</td>
</tr>
<tr>
<td>5</td>
<td>March 2002</td>
<td>General Electric Capital Corp. (GECC)</td>
<td>$11.0 Bn</td>
<td>US$</td>
</tr>
<tr>
<td>6</td>
<td>November 2001</td>
<td>AT&amp;T</td>
<td>$10.1 Bn</td>
<td>US$, Euro</td>
</tr>
<tr>
<td>7</td>
<td>December 2000</td>
<td>British Telecom</td>
<td>$10.0 Bn</td>
<td>US$</td>
</tr>
<tr>
<td>8</td>
<td>October 2001</td>
<td>Ford/Ford Motor Credit</td>
<td>$9.4 Bn</td>
<td>US$, Euro</td>
</tr>
<tr>
<td>9</td>
<td>January 2001</td>
<td>Ford Motor Credit</td>
<td>$9.3 Bn</td>
<td>US$, Euro</td>
</tr>
<tr>
<td>10</td>
<td>July 1999</td>
<td>Ford/Ford Motor Credit</td>
<td>$8.6 Bn</td>
<td>US$</td>
</tr>
</tbody>
</table>
Innovations in US Corporate Bond Market

- **Early ‘80s**
  - Swaps to create funding efficiencies and foster cross-currency funding opportunities

- **Early/mid ’80s**
  - Deep and liquid high-yield market (“junk bonds”)

- **Late ’80s**
  - Puttable bonds

- **1993**
  - 100-year bonds (“Century Bonds”)

- **1993**
  - Tax-deductible preferred stock (equity credit at a debt cost)

- **Continuous**
  - Issuance in new currencies (e.g., CZK, DKK, HUF, NOK, SGD, ZAR)

- **1995**
  - Retail investor-targeted debt ($25 par baby bonds, MTNs)

- **1996-1997**
  - Synthetic put bonds (derivatives market-enhanced optionality for issuers)

- **1997**
  - Inflation-linked debt

- **1997**
  - GIC-backed notes

- **Late ’90s**
  - Evolution of European credit market

- **2000**
  - Extendible notes (expand 2a7 money fund capacity at status quo backstop bank facility capacity)

- **Early ’00s**
  - Credit default swaps as a risk management tool
Interest Rate Swaps

- An interest rate swap is an agreement between two counterparties to exchange a set of cashflows over an agreed time period in the future.

- An interest rate swap is essentially a PV-weighted average of expected future LIBOR rates.

**5yr Interest Rate Swap Diagram**

**Intuition Behind Pricing**

**Illustrative Cashflow**

<table>
<thead>
<tr>
<th>Beg of Period</th>
<th>End of Period</th>
<th>Discount Factor</th>
<th>Coupon</th>
<th>PV Pmt</th>
<th>LIBOR</th>
<th>PV Pmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/9/04</td>
<td>3/9/05</td>
<td>0.9896</td>
<td>3.92%</td>
<td>1.94</td>
<td>2.08%</td>
<td>1.04</td>
</tr>
<tr>
<td>3/9/05</td>
<td>9/9/05</td>
<td>0.9761</td>
<td>3.92%</td>
<td>1.91</td>
<td>2.72%</td>
<td>1.36</td>
</tr>
<tr>
<td>9/9/05</td>
<td>3/9/06</td>
<td>0.9605</td>
<td>3.92%</td>
<td>1.88</td>
<td>3.22%</td>
<td>1.56</td>
</tr>
<tr>
<td>9/9/06</td>
<td>9/11/06</td>
<td>0.9429</td>
<td>3.92%</td>
<td>1.85</td>
<td>3.63%</td>
<td>1.77</td>
</tr>
<tr>
<td>9/11/06</td>
<td>3/9/07</td>
<td>0.9246</td>
<td>3.92%</td>
<td>1.81</td>
<td>3.98%</td>
<td>1.83</td>
</tr>
<tr>
<td>3/9/07</td>
<td>9/10/07</td>
<td>0.9047</td>
<td>3.92%</td>
<td>1.77</td>
<td>4.28%</td>
<td>1.99</td>
</tr>
<tr>
<td>9/10/07</td>
<td>3/10/08</td>
<td>0.8845</td>
<td>3.92%</td>
<td>1.73</td>
<td>4.51%</td>
<td>2.02</td>
</tr>
<tr>
<td>3/10/08</td>
<td>9/9/08</td>
<td>0.8637</td>
<td>3.92%</td>
<td>1.69</td>
<td>4.74%</td>
<td>2.08</td>
</tr>
<tr>
<td>9/9/08</td>
<td>3/9/09</td>
<td>0.8428</td>
<td>3.92%</td>
<td>1.65</td>
<td>4.93%</td>
<td>2.09</td>
</tr>
<tr>
<td>3/9/09</td>
<td>9/9/09</td>
<td>0.8214</td>
<td>3.92%</td>
<td>1.61</td>
<td>5.11%</td>
<td>2.14</td>
</tr>
</tbody>
</table>

NPV 17.86

**LIBOR Forwards vs. Swap Rate**

5yr Swap Rate = 3.92%

**Client**

5yr Interest Rate Swap Diagram

NPV 17.86

**Deutsche Bank**
Interest Rate Swaps: Who Uses and Why?

<table>
<thead>
<tr>
<th></th>
<th>Pay Floating; Receive Fixed</th>
<th>Receive Floating; Pay Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Banks</strong></td>
<td>Match assets with liabilities; Leverage balance sheet</td>
<td>Match assets with liabilities</td>
</tr>
<tr>
<td><strong>Agencies/Mortgage</strong></td>
<td>Convexity hedging / Manage prepayment risk</td>
<td>Convexity hedging / Manage average life extension risk</td>
</tr>
<tr>
<td><strong>Hedge funds</strong></td>
<td>Relative value / Yield enhancement / Yield curve riding / leverage asset base</td>
<td>Relative value / Yield enhancement</td>
</tr>
<tr>
<td><strong>Corporates</strong></td>
<td>Hedging interest rate exposure (mostly converting fixed debt to floating)</td>
<td>Hedge anticipated fixed-rate issuance or swap floating-rate bank debt to fixed</td>
</tr>
<tr>
<td><strong>Fund managers</strong></td>
<td>Relative value / Yield enhancement</td>
<td>Relative value / Yield enhancement</td>
</tr>
</tbody>
</table>
Floating Interest Rates – Forward Curve

In a steep yield curve environment, such as the current one, forward rates suggest a rapid near-term rise in rates. Many market participants will elect to “bet” against this by over-weighting fixed-rate assets or floating-rate liabilities, or both.

Current Swap Rates (9/7/04)
- 1-Year: 2.42%
- 2-Year: 2.95%
- 3-Year: 2.34%
- 4-Year: 3.66%
- 5-Year: 3.92%

Current 3mL (9/7/04): 1.86%

Forward LIBORs
- Sept ’04: 1.86% (+0bps)
- Dec ’04: 2.29% (+43bps)
- Mar ’05: 2.59% (+73bps)
- Jun ’05: 2.86% (+100bps)
- Dec ’05: 3.27% (+141bps)
- Dec ’06: 3.99% (+213bps)
- Dec ’07: 4.51% (+265bps)
Overprediction of LIBOR Forward Curves

The “hair chart” illustrates that forward curves have nearly systematically overpredicted the eventual path of LIBOR.
Cross-Currency Swaps

- A cross-currency swap can be used to convert interest and principal denominated in one currency into another currency (e.g., from the foreign currency into a company’s functional, or local, currency)

  - **Euro Fixed/Floating Swap**: The Euro LIBOR leg is eventually crossed out by the Euro LIBOR leg from the Basis swap

  - **Basis swap**: Adjusts floating-rates across different currencies: in this example between US$ LIBOR and Euro LIBOR

  - **USD Fixed/Floating Swap**: The US$ LIBOR leg crosses out the US$ LIBOR leg from the Basis swap
Cross-Currency Issuance Case Study: SLM Corporation (A2/A) in Australian Dollars

Fixed-Rate Notes

- Announcement Date: May 5, 2004
- Maturity Date: May 18, 2009
- Size: A$375mm
- Launch Spread: Mid Swaps + 40 bps
- Bookrunners: Deutsche Bank, UBS
- Co-Managers: CBA, Citigroup, NAB, RBC

Floating-Rate Notes

- Announcement Date: May 5, 2004
- Maturity Date: May 18, 2009
- Size: A$225mm
- Launch Spread: Bank Bills + 40 bps
- Bookrunners: Deutsche Bank, UBS
- Co-Managers: CBA, Citigroup, NAB, RBC

Transaction Highlights and Motivation

- This transaction represents SLM's inaugural offering in the Australian market, and at a total size of A$600mm, this was the largest single-A kangaroo bond ever issued in the Australian market.
- With total annual unsecured debt issuance needs of $10+ billion, SLM looks to maximize investor diversification by issuing in multiple currencies and regions. Investor diversification leads to increased demand for SLM's paper and ultimately more attractive debt pricing.
- As such, Deutsche Bank recommended an Australian transaction, providing SLM with access to a completely new investor base. Being a new issuer in the Australian market, SLM was able to achieve attractive pricing as investors looked to include a new US credit in their portfolios.
- As the US Dollar is SLM's functional currency, the entire deal was swapped to US$. The attractive basis swap between A$ and US$ allowed SLM to meet its funding targets.
- This transaction met SLM's goals of investor diversification and issuance at levels slightly better than US$ levels (2 to 3 bps).
- With such a successful transaction, SLM has positioned itself well to be a regular and well-received issuer in the domestic Aussie market.
Evolution of the Interest Rate and Currency Swap Market

The near exponential growth of the swap market has been driven by a broader awareness of and comfort with this technology’s ability to mitigate risk, transform cash flows and generate returns.

Source: International Swap and Derivatives Association
Development of Mortgage and Asset Backed Securities
Development of the Mortgage Backed Securities Market

- Total Size of U.S. Mortgage Market: $7.5 Trillion
- Roughly $4.0 Trillion in MBS outstanding
- $3.5 Trillion in Agency MBS outstanding
  - $2.5 Trillion in Agency MBS
    - $1.5 Trillion FNMA
    - $0.6 Trillion FHLMC
    - $0.4 Trillion GNMA
  - $1.0 Trillion in Agency CMOs
    - $0.5 Trillion FHLMC
    - $0.4 Trillion FNMA
    - $0.1 Trillion GNMA
- Roughly $0.5 Trillion in Non-Agency CMOs

Source: Bond Market Association Statistics (March 31, 2004), Deutsche Bank Securities
Mortgage-Backed Securities
Securitization: Turning Loans into Securities

Birth of Mortgage-Backed Securities

BANK

8% 30 Year Mortgage Obligation, with house pledged as collateral

INDIVIDUAL HOMEOWNER

Borrows Money

$100,000
Mortgage-Backed Securities (continued)

Mortgages Swapped to become Mortgage-Backed Securities

With possession of FNMA instead of Mortgages, Bank can:
1. Sell FNMA into liquid market
2. Borrow against it efficiently
3. Keep it on balance sheet with less capital

$1 million 7.5%
FNMA Certificate
backed by 'Full Faith and Credit' of U.S. Government

Bank swaps a pool of ten
$100,000 8% interest rate
mortgages

Pays insurance
premium 0.25%
Continues to receive
Servicing Fee 0.25%

8% 30 Year Mortgage Obligation, with house pledged as collateral

Borrows Money
$100,000

FNMA
("Federal National Mortgage Association")
Typical Bank Balance Sheet

Assets

- FNMA Certificates
- Single-Family Mortgages
- Student Loans
- Auto Loans
- Credit Card Loans

Liabilities

- Deposits
- Term Notes
- Preferred Stock
- Equity

More Liquid

Senior

Less Liquid

Subordinated
Collateralized Mortgage Obligations

- CMO’s allowed cash flows of 30 year mortgages to be cut up and tailored to suit investor preferences.

Tranching of Cash Flows

FNMA 7.5% CASH FLOW (12 YEAR AVERAGE LIFE, 30 YEAR AMORTIZATION)

<table>
<thead>
<tr>
<th>Investment Horizon:</th>
<th>Short Term</th>
<th>Intermediate Term</th>
<th>Intermediate/Long Term</th>
<th>Long Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Life:</td>
<td>2 years</td>
<td>5 years</td>
<td>10 years</td>
<td>20 years</td>
</tr>
<tr>
<td>Amortization Window:</td>
<td>4 years</td>
<td>4 years</td>
<td>8 years</td>
<td>14 years</td>
</tr>
<tr>
<td>Investor Type:</td>
<td>Banks</td>
<td>Banks/Insurance</td>
<td>Insurance</td>
<td>Insurance/Pension Funds</td>
</tr>
</tbody>
</table>
Impact of CMO’s on Mortgage Costs

30 Year Mortgage Benchmark vs. 30 Year Treasury Benchmark

Average Spread Before CMO’s: 286 bps

Average Spread After CMO’s: 134 bps

Source: Freddie Mac & Bloomberg
ABS Market Overview

- Wall Street starts to turn its attention to securitization of other asset categories:

**ABS Market Continues Growth Trajectory**

*Data annualized.

Source: Deutsche Bank, Thomson Financial Securities Data
ABS Market Overview (continued)

Estimated Outstandings of U.S. Fixed Income Securities – $22.8 Trillion

- Mortgage Related, $5.4 trillion, 23.5%
- Corporate, $4.6 trillion, 20.0%
- US Treasury, $3.8 trillion, 16.5%
- Fed Agencies, $2.8 trillion, 12.1%
- Money Market, $2.6 trillion, 11.6%
- Municipal, $2.0 trillion, 8.6%
- Asset Backed, $1.8 trillion, 7.8%

As of Q2 2004

Source: Bond Market Association
The Forces Driving Asset Securitization

<table>
<thead>
<tr>
<th>Issuer Incentives</th>
<th>Investor Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Capital efficiency</td>
<td>- Attractive nominal yield and better credit relative to corporates for similar ratings</td>
</tr>
<tr>
<td>- Funding diversification</td>
<td>- Generally low payment variability relative to MBS</td>
</tr>
<tr>
<td>- Asset-liability management</td>
<td>- Excellent liquidity in most sectors</td>
</tr>
<tr>
<td>- Accounting gain on sale</td>
<td></td>
</tr>
<tr>
<td>- Manage portfolio growth</td>
<td></td>
</tr>
</tbody>
</table>
Some Top Clients
# League Tables: Total ABS Market

## 2003

(Excluding Self-Funded Issues & Shelf Issues)

<table>
<thead>
<tr>
<th>Lead Manager</th>
<th>Principal (mm)(^{(1)})</th>
<th>Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Citigroup</td>
<td>$45,555.2</td>
<td>11.8</td>
</tr>
<tr>
<td>2 Deutsche Bank Securities</td>
<td>40,502.0</td>
<td>10.5</td>
</tr>
<tr>
<td>3 JPMorgan</td>
<td>36,735.2</td>
<td>9.5</td>
</tr>
<tr>
<td>4 Credit Suisse First Boston</td>
<td>34,849.9</td>
<td>9.1</td>
</tr>
<tr>
<td>5 Banc of America Securities</td>
<td>30,473.5</td>
<td>7.9</td>
</tr>
<tr>
<td>6 Morgan Stanley</td>
<td>29,261.3</td>
<td>7.6</td>
</tr>
<tr>
<td>7 Lehman Brothers</td>
<td>25,878.6</td>
<td>6.7</td>
</tr>
<tr>
<td>8 Greenwich Capital</td>
<td>25,160.0</td>
<td>6.5</td>
</tr>
<tr>
<td>9 Merrill Lynch</td>
<td>20,865.0</td>
<td>5.4</td>
</tr>
<tr>
<td>10 Bear Stearns</td>
<td>19,314.2</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Total of top 10 Managers</strong></td>
<td><strong>$308,594.9</strong></td>
<td><strong>80.2%</strong></td>
</tr>
<tr>
<td><strong>Industry Total</strong></td>
<td><strong>$384,944.3</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: Thomson Financial Securities Data (SDC) and Deutsche Bank Securities

1) In U.S. dollar equivalents based on exchange rate as of pricing date.

## 2004 Year to Date (\(^{2}\))

(Excluding Self-Funded Issues & Shelf Issues)

<table>
<thead>
<tr>
<th>Lead Manager</th>
<th>Principal (mm)(^{(1)})</th>
<th>Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Citigroup</td>
<td>$32,328.0</td>
<td>12.5</td>
</tr>
<tr>
<td>2 Deutsche Bank Securities</td>
<td>25,211.0</td>
<td>9.7</td>
</tr>
<tr>
<td>3 JPMorgan</td>
<td>23,385.7</td>
<td>9.0</td>
</tr>
<tr>
<td>4 Greenwich Capital</td>
<td>21,724.4</td>
<td>8.4</td>
</tr>
<tr>
<td>5 Credit Suisse First Boston</td>
<td>21,191.1</td>
<td>8.2</td>
</tr>
<tr>
<td>6 Merrill Lynch</td>
<td>21,109.3</td>
<td>8.2</td>
</tr>
<tr>
<td>7 Banc of America Securities</td>
<td>17,967.2</td>
<td>6.9</td>
</tr>
<tr>
<td>8 Lehman Brothers</td>
<td>16,750.9</td>
<td>6.5</td>
</tr>
<tr>
<td>9 Morgan Stanley</td>
<td>15,575.9</td>
<td>6.0</td>
</tr>
<tr>
<td>10 UBS</td>
<td>14,746.7</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>Total of top 10 Managers</strong></td>
<td><strong>$209,990.2</strong></td>
<td><strong>81.1%</strong></td>
</tr>
<tr>
<td><strong>Industry Total</strong></td>
<td><strong>$258,987.8</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: Thomson Financial Securities Data (SDC) and Deutsche Bank Securities

2) As of July, 2004
Case Study: Capital One

- As the ABS Market has grown to rival corporate market, an increasing number of major corporations have used securitization as a principal means of financing their business:

Capital One: Alternative Funding

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Credit Cards</th>
<th>Prime Autos</th>
<th>Sub-Prime Autos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autos</td>
<td>92.0% Corporate Debt</td>
<td>BBB (L+70)</td>
<td>AAA (L+11)</td>
<td>AAA</td>
</tr>
<tr>
<td>Credit Cards</td>
<td>8.0% Equity</td>
<td>81.25%</td>
<td>A (L+36)</td>
<td>87.0% AAA</td>
</tr>
<tr>
<td>International</td>
<td></td>
<td>10.0%</td>
<td>BBB (L+83)</td>
<td>13.0% O/C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.25%</td>
<td>O/C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AAA-BBB avg = L+ 70 bps vs. AAA-BBB avg = L+ 19 bps
History of ABS – An Issuer’s Perspective

Steve Linehan, SVP & Treasurer, Capital One Financial Corporation
Capital One is:

- A major credit card player
  - 5th Largest Visa/Mastercard issuer
  - $45.3 managed U.S. credit card assets

- A diversified consumer financial services company
  - 2003: $1.1B net income, ROA 1.52%, ROE 23.4%
  - $71.8B in managed loans
  - 37% of assets are outside of U.S. Card
  - 18% of Q1 2004 profits are non U.S. Card

- 34th largest depository institution in the U.S.
  - $23.6B in deposits
  - Direct Retail Deposits
  - Brokered Deposits

- A significant capital markets issuer
  - Over $20.2B of Capital Markets issuance in 2003
  - ABS programs include U.S. credit card, non-prime and prime auto, U.K. credit card
  - Unsecured programs include senior and subordinate debt
  - Ratings: BB+/BBB- Baa3/Baa2
Capital One continues to deliver strong earnings

Earnings Per Share

|------|------|------|------|------|------|------|------|------|------|------|-------|
| EPS  | $0.48| $0.64| $0.77| $0.93| $1.32| $1.72| $2.24| $2.91| $3.93| $4.85| $5.60-
|      |      |      |      |      |      |      |      |      |      |      | $5.90 |

Growth Rate

- 1994: 33%
- 1995: 21%
- 1996: 21%
- 1997: 42%
- 1998: 30%
- 1999: 30%
- 2000: 30%
- 2001: 35%
- 2002: 23%
- 2003: 15-22%
- 2004E: 15-22%

One of three companies to earn > 20% EPS growth for 10 consecutive years

Capital One’s Killer App: The Information Based Strategy - IBS

World Class People & Analytics

Scientific Laboratory

One of the Largest Databases in the World

Massive Innovation

Micro-segmentation/Mass Customization

Quantum Advance in Risk Management
We are using IBS to diversify our assets

Diversified Managed Outstandings

- Auto: $9.4B (13%)
- GFS: $18.7B (25%)
- Card: $45.2B (62%)

Funding Mix – Securitization is important to Capital One

Total Managed Liabilities and Capital

* Includes repos, Fed Funds, trust preferred securities, various payables and other liabilities
The Rationale for Securitization

**Funding Cost**
- Allows lower-rated companies to fund at approximately AA levels

**Funding, Diversification, & Liquidity**
- The higher ratings on issuer’s securitization “debt” vs. its unsecured debt broadens its investor base and enhances its liquidity

**Accounting & Regulatory Capital Requirements**
- Transactions may represent risk transfer and qualify as sales
  - Issuers don’t need to hold capital against securitized assets for regulatory capital requirements
  - Issuers don’t need to reserve against loan losses on securitized assets

**Asset Liability Management**
- Securitization transactions are an effective tool for asset liability management, including maturity, currency, and basis (fixed vs. floating) management
Securitization enables us to access deeper investor bases at lower costs.

Securitization benefit increases during times of market disruptions.
Credit Card securitization involves the issuance of securities secured by a designated pool of asset receivables “sold” to a bankruptcy remote entity.
The financial engineering of cash flows creates credit rating efficiency

As unsecured revolving debt obligations, credit card receivables offer limited recovery in the event of cardholder default.

To achieve investment-grade ratings, credit enhancement is needed to protect investors from changes in loss performance.

Credit enhancement is provided through:

- **Subordination (Class B and C tranches)**
  - Interest and principal payments are made to subordinate tranches only after all senior payments have been made.

- **Excess spread** is the net income of a securitization trust that flows back to the issuer.

- **Spread or reserve accounts**
  - A mechanism to capture excess spread if performance begins to deteriorate.

### Capital One Subordination Structure

<table>
<thead>
<tr>
<th>Class</th>
<th>Rating</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>81.25% (“AAA”)</td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>10% (“A”)</td>
<td></td>
</tr>
<tr>
<td>Class C</td>
<td>7.25% (“BBB”)</td>
<td></td>
</tr>
<tr>
<td>Class D</td>
<td>1.50% (“BB”)</td>
<td></td>
</tr>
</tbody>
</table>

**Excess spread is function of:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust revenue</td>
<td>20.00%</td>
</tr>
<tr>
<td>Gross portfolio yield</td>
<td></td>
</tr>
<tr>
<td>Trust expenses</td>
<td></td>
</tr>
<tr>
<td>Investor coupon</td>
<td>-5.00%</td>
</tr>
<tr>
<td>Servicing fee</td>
<td>-2.00%</td>
</tr>
<tr>
<td>Charge offs</td>
<td>-6.00%</td>
</tr>
<tr>
<td>Trust net income</td>
<td>7.00%</td>
</tr>
<tr>
<td>Excess spread</td>
<td></td>
</tr>
</tbody>
</table>
Credit Card ABS have bullet maturities just like corporate unsecured bonds making them attractive to a broad investor base.

**Investment: Credit card ABS, three-year bullet maturity**

**Bond cash flow** $10,000,000 investment

- Interest paid to investor
- Principal paid to investor

**Collateral: Credit card accounts, monthly principal and interest receipts**
Funding costs are lower and less volatile than the company’s corporate debt

Indicative 5 Year Fixed Rate Cost of Funds for Capital One

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Low</th>
<th>Average</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposits</td>
<td>6.13%</td>
<td>3.60%</td>
<td>4.72%</td>
<td>0.60%</td>
</tr>
<tr>
<td>Corporate Debt</td>
<td>11.29%</td>
<td>3.78%</td>
<td>6.66%</td>
<td>1.92%</td>
</tr>
<tr>
<td>Card ABS</td>
<td>5.95%</td>
<td>3.13%</td>
<td>4.37%</td>
<td>0.76%</td>
</tr>
</tbody>
</table>

*ABS represents the weighted avg. cost of funds for 5 year COMET deal including A, B and C tranches
Securitization is an effective capital management tool

Illustrative Example

<table>
<thead>
<tr>
<th>% of Capital Required</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Securitization</td>
<td>10%</td>
</tr>
<tr>
<td>Without Securitization</td>
<td>20%</td>
</tr>
</tbody>
</table>
Securitization markets provide flexibility to meet our asset-liability management objectives

**Deterministic Net Interest Income Sensitivity**

% Change in 12 Month NII

- NII rises 1.4% or $78MM
- Limit 7/31/04

**Programs**

- Fixed Rate 3, 5, 7 years
- Floating Rate 3, 5, 7, 10, 15 years
- £ Denominated transactions using US Collateral
- € Denominated transactions using £ collateral
- € Denominated transactions using £ collateral
- £ Denominated transactions using £ collateral

$34B swap book also used to manage interest rate & currency risk
Capital One continues to enjoy success in the capital markets

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>1H 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S. Card Securitizations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triple-A</td>
<td>$5,100</td>
<td>$3,100</td>
</tr>
<tr>
<td>Single-A</td>
<td>$1,100</td>
<td>$650</td>
</tr>
<tr>
<td>Triple-B</td>
<td>$1,375</td>
<td>$668</td>
</tr>
<tr>
<td><strong>U.K. Card Securitizations</strong></td>
<td>$981</td>
<td>$1,249</td>
</tr>
<tr>
<td><strong>(1)</strong> Auto Loan Securitizations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prime</td>
<td>$2,000</td>
<td>$850</td>
</tr>
<tr>
<td>Non-Prime</td>
<td>$2,125</td>
<td>$1,000</td>
</tr>
<tr>
<td>Senior Notes</td>
<td>$2,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Subordinated Notes</td>
<td>$500</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$20,271</td>
<td>$10,279</td>
</tr>
</tbody>
</table>

1) In U.S. dollar equivalents based on exchange rate as of pricing date
Capital One expects to remain a lead issuer in the securitization market

<table>
<thead>
<tr>
<th>Issuer</th>
<th>Total $ (billions)</th>
<th>(%)</th>
<th>Issuer</th>
<th>Total $ (billions)</th>
<th>(%)</th>
<th>Issuer</th>
<th>Total $ (billions)</th>
<th>(%)</th>
<th>Issuer</th>
<th>Total $ (billions)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Citibank</td>
<td>14.1</td>
<td>21.7</td>
<td>1 Bank One</td>
<td>5.7</td>
<td>18.8</td>
<td>1 GMAC</td>
<td>10.4</td>
<td>13.4</td>
<td>1 GMAC</td>
<td>4.6</td>
<td>9.0</td>
</tr>
<tr>
<td>2 Bank One</td>
<td>10.4</td>
<td>16.1</td>
<td>2 MBNA</td>
<td>5.2</td>
<td>17.2</td>
<td>2 Honda</td>
<td>6.1</td>
<td>7.8</td>
<td>2 Ford</td>
<td>4.6</td>
<td>9.0</td>
</tr>
<tr>
<td>3 MBNA</td>
<td>9.1</td>
<td>14.0</td>
<td>3 Capital One</td>
<td>4.6</td>
<td>15.1</td>
<td>3 Nissan</td>
<td>5.9</td>
<td>7.6</td>
<td>3 WFS</td>
<td>4.1</td>
<td>8.0</td>
</tr>
<tr>
<td>4 Capital One</td>
<td>6.9</td>
<td>10.7</td>
<td>4 Citibank</td>
<td>4.4</td>
<td>14.4</td>
<td>4 WFS</td>
<td>4.8</td>
<td>6.2</td>
<td>4 Daimler Chrysler</td>
<td>4.1</td>
<td>8.0</td>
</tr>
<tr>
<td>5 Chase</td>
<td>6.5</td>
<td>10.0</td>
<td>5 Chase</td>
<td>3.4</td>
<td>11.1</td>
<td>5 Ford</td>
<td>4.7</td>
<td>6.0</td>
<td>5 Honda</td>
<td>3.5</td>
<td>7.0</td>
</tr>
<tr>
<td>6 Discover</td>
<td>3.6</td>
<td>5.5</td>
<td>6 American Express</td>
<td>3.4</td>
<td>11.0</td>
<td>6 Daimler Chrysler</td>
<td>4.3</td>
<td>5.5</td>
<td>6 USAA</td>
<td>3.0</td>
<td>6.0</td>
</tr>
<tr>
<td>7 American Express</td>
<td>3.1</td>
<td>4.8</td>
<td>7 Providian</td>
<td>1.5</td>
<td>4.8</td>
<td>7 Chase</td>
<td>3.6</td>
<td>4.6</td>
<td>7 Nissan</td>
<td>2.5</td>
<td>5.0</td>
</tr>
<tr>
<td>8 Gracechurch</td>
<td>3.0</td>
<td>4.6</td>
<td>8 GE</td>
<td>1.0</td>
<td>3.3</td>
<td>8 Capital One</td>
<td>3.5</td>
<td>4.5</td>
<td>8 Capital One</td>
<td>2.5</td>
<td>5.0</td>
</tr>
<tr>
<td>9 Household</td>
<td>2.3</td>
<td>3.5</td>
<td>9 Gracechurch</td>
<td>0.8</td>
<td>2.6</td>
<td>9 AmeriCredit</td>
<td>3.3</td>
<td>4.3</td>
<td>9 AmeriCredit</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>10 Advanta</td>
<td>1.5</td>
<td>2.3</td>
<td>10 World Financial Network</td>
<td>0.5</td>
<td>1.7</td>
<td>10 Toyota</td>
<td>2.9</td>
<td>3.7</td>
<td>10 Chase</td>
<td>1.5</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Industry Total 64.9 100.0 Industry Total 30.5 100.0 Industry Total 77.7 100.0 Industry Total 50.8 100.0

Source: Deutsche Bank Securitization Monthly
As of July 31, 2004

#3 ABS Issuer in 2003
#1 ABS issuer YTD 2004