Protecting Your Agency's Portfolio

Presented by:

Office of the State Treasurer

November 4, 2008

Part I

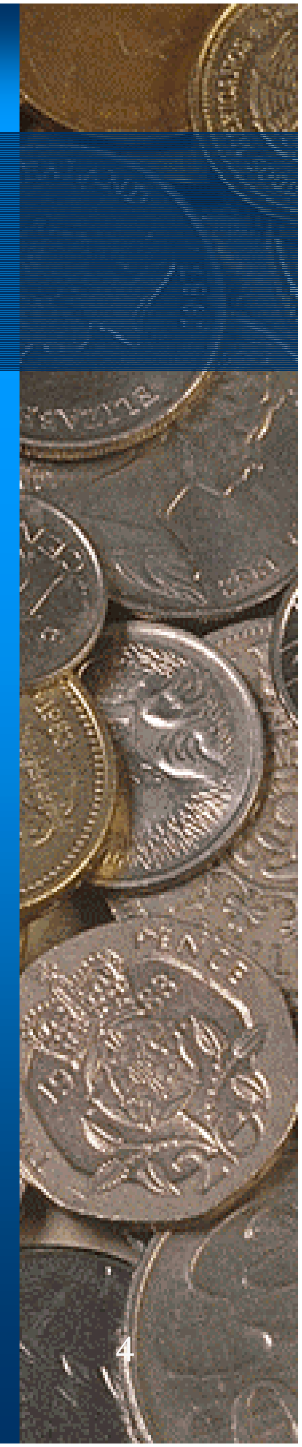
Portfolio Risks

Types of Risk

- Legal Risk - violation of law
- Credit Risk/Default Risk
  - Issuer of debt is unable to repay the holder of a security
  - Also the risk that an issuer is downgraded below your minimum credit rating
- Market/Interest Rate Risk
  - Price depreciation of a security you own due to a change in interest rates or other adverse conditions (interest rates move inversely to prices)
  - Results in an unrealized or “paper” loss unless security has to be sold

Types of Risk (Cont'd.)

- Liquidity Risk
  - Inability to sell a security at a competitive price
  - Agency does not have enough cash to make payments due to:
    - Cash Flow Issues
      - Unexpected decline in revenues or increased expenditures
      - Inaccurate cash flow forecast
    - Extension of callables to maturity date or a slowing of paydowns on a MBS ("extension risk")



Types of Risk (Cont'd.)

- Reinvestment Risk
  - Cash flow generated by a security is reinvested at a lower rate than what is earned on the security
    - Callable securities are called when interest rates decline
    - Mortgage Backed Securities
- Internal Risk
  - Opportunity for theft or other malfeasance due to lack of internal controls, insufficient segregation of duties, etc.

Legal Risk

Issue

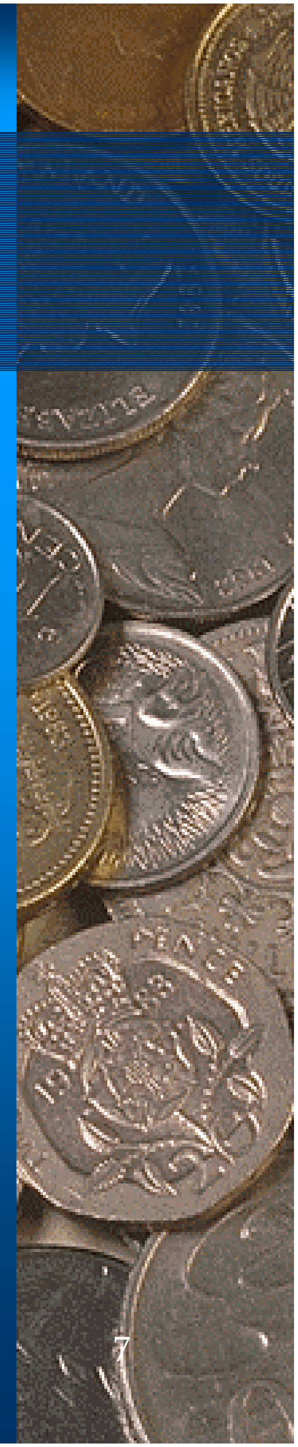
- New financial products such as auction rate securities have been introduced to the market during the last 5-10 years
- Broker-dealers may be unaware of the legal constraints that local governments operate under

Solution

- Review the statutes that govern your agency
- Undergo an Investment Policy check-up to determine if your policy requires updating or “tightening”
- Include an Investment Policy Compliance page in your reports to your board

Investment Policy

- An investment policy is a statement of your agency's tolerance for risk
- Establishes a consensus between finance/ investment staff and board on what acceptable risks are
- Strategy at any one time may be <u>more</u> conservative than your policy
- Have you updated or examined your policy in the last 2 years?



Investment Policy

<u>Major Components of an Investment Policy</u>

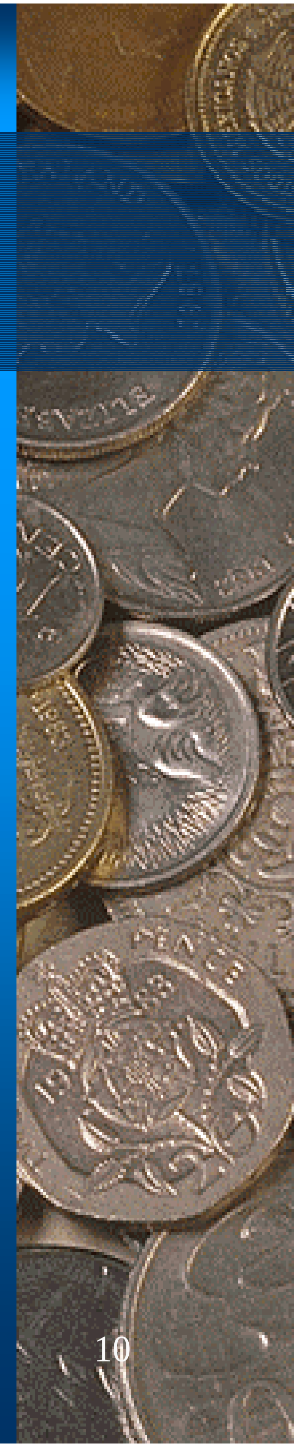
- Legal Authority
- Ethics
- Prudent Person Rule
- Investment Objectives (S – L – Y)
- Delegation of Authority/Internal Controls
- Safekeeping/Custody of Assets

Investment Policy

Major Components of an Investment Policy

- List of Permissible Investments
  - Maximum maturity
  - Maximum allocation for asset class
  - Diversification limits
  - Minimum credit rating

Sample Investment Policy Compliance Report



Office of the Missouri State Treasurer
INVESTMENT POLICY COMPLIANCE
August 31, 2008

v

I. Overall Portfolio	Policy Limit	Actual Portfolio Value	Compliance
(1) Maximum Effective Duration	1.50	0.58	YES
(2) Liquidity - minimum pctg. of portfolio with a maturity of 12 mo or less	40.0%	62.8%	YES

II. Ratings Limits	Minimum Rating		Lowest Actual Rating		Compliance	Issuer(s)
A. Commercial Paper						
1. Short-Term Credit Rating	A-1	P-1	A-1	P-1	YES	Multiple Issuers
2. Long-Term Rating (if applicable)	A-	A3	A	A2	YES	Multiple Issuers

III. Term Restrictions	Maximum Term	Longest Actual Term	Compliance	Longest Security	
				Maturity	Issue
A. General Time Deposits	5.0 yrs	1.8 yrs	YES	6/18/10	Multiple issuers
B. US Treasuries	5.0 yrs	1.2 yrs	YES	11/30/09	T 3.125 11/30/09
C. Federal Agencies Securities					
Noncallable Bonds	5.0 yrs	1.8 yrs	YES	6/22/10	FHLB 4.5 6/22/10
Callable Bonds	5.0 yrs	4.8 yrs	YES	7/1/13	FHLMC 5 7/1/13
Mortgage-Backed Securities	5.0 yrs	4.9 yrs	YES	8/1/13	CUSIP 31371LB99
D. Commercial Paper	180 days	39 days	YES	10/9/08	GE Capital
E. Repurchase Agreements	90 days	2 days	YES	9/2/08	Bank of America

IV. Per-Issuer Restrictions	Max. Pct. of Portfolio	Actual Portfolio Value	Compliance	Maximum Per-Issuer Exposure	
				Holdings	Issuer(s)
A. General Time Deposits *(% of Total General Time Deposits)*	7.5%	6.3%	YES	$ 41,000,000	Union Bank
B. Commercial Paper	5.0%	2.2%	YES	$ 90,000,000	GE Capital
C. Repurchase Agreements	15.0%	7.7%	YES	$ 317,071,000	Bank of America

Constitutional References
(State Treasurer's Office)

- Article IV, Section 15
  - Identifies Investment Authority of State Treasurer
  - Five Year Maximum Maturity
    - Time Deposits in Missouri Financial Institutions
    - U.S. Treasuries
    - U.S. Government Agencies
    - Repurchase Agreements
      - Up to 90 days
    - Commercial Paper and Bankers Acceptances
      - Up to 180 days

Statutory References for School Districts

- Chapter 165.051, RSMo.
  - Allows School Districts to Place Surplus Funds in:
    - Time Deposits (CDs)
    - Article IV – Sec. 15 Securities, and
    - State of Missouri Bonds
- Chapter 67.085, RSMo.
  - CDARS Program

Statutory References for Counties

- Chapter 110.270, RSMo.
  - Article IV – Sec. 15 Securities Through a Local Financial Institution
- Chapter 67.085, RSMo.
  - CDARS Program

Statutory References

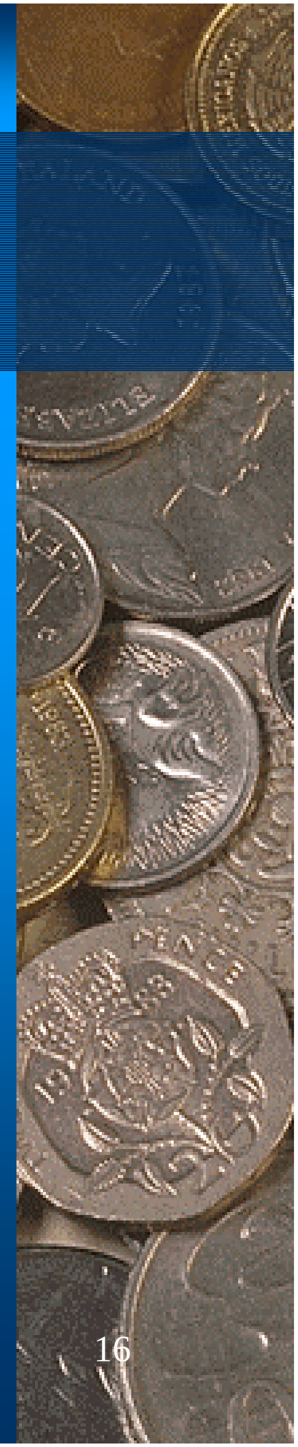
(Written Investment Policy)

- Chapter 30.950, RSMo.
  - Any Political Subdivision Responsible for Investment of Public Funds Shall Develop and Adhere to a Written Investment Policy
  - Lack of Written Policy Limits a Political Subdivision to Authorized Investments as of January 1, 1997 (maximum of 3 years, no commercial paper)
  - STO Required to Prepare Model Investment Policy
    - Adoption Constitutes Compliance with Section.
    - Available online at www.treasurer.mo.gov

Statutory References
(Collateral Provisions)

- Chapter 110.010, RSMo.
  - Requires all Public Funds be Collateralized
- Chapter 110.020, RSMo.
  - Market Value of Collateral Shall be at Least 100% of Amount on Deposit (Less FDIC Ins.)
- Chapter 30.270, RSMo.
  - Lists Acceptable Collateral

Liquidity Risk
(Individual Securities)



Issue

- In this credit crisis, the ability to easily sell securities in the open market has dramatically worsened.
- Bid-ask spreads have widened.
- Spreads on “spread” product like Agencies have widened to historic levels, so even though Treasury yields have fallen, your Agency securities may show an unrealized loss.

Solution

- Diversify the types of asset classes you hold.
- Purchase securities with an active secondary market
- An Ounce of Prevention….

  Prepare a Cash Flow Forecast so you are not forced to sell securities.

Liquidity Risk
(Overall Portfolio)

<u>Issue</u>

- If recession takes hold or worsens, some of your agency's revenues likely will decline or at best remain flat
- Some of your callable agency securities you hold may <u>not</u> be called.
- Local governments will have trouble issuing debt if credit crisis continues
- <u>Remember</u> - Budget and liquidity issues do not necessarily track together

<u>Solution</u>

- An Ounce of Prevention….

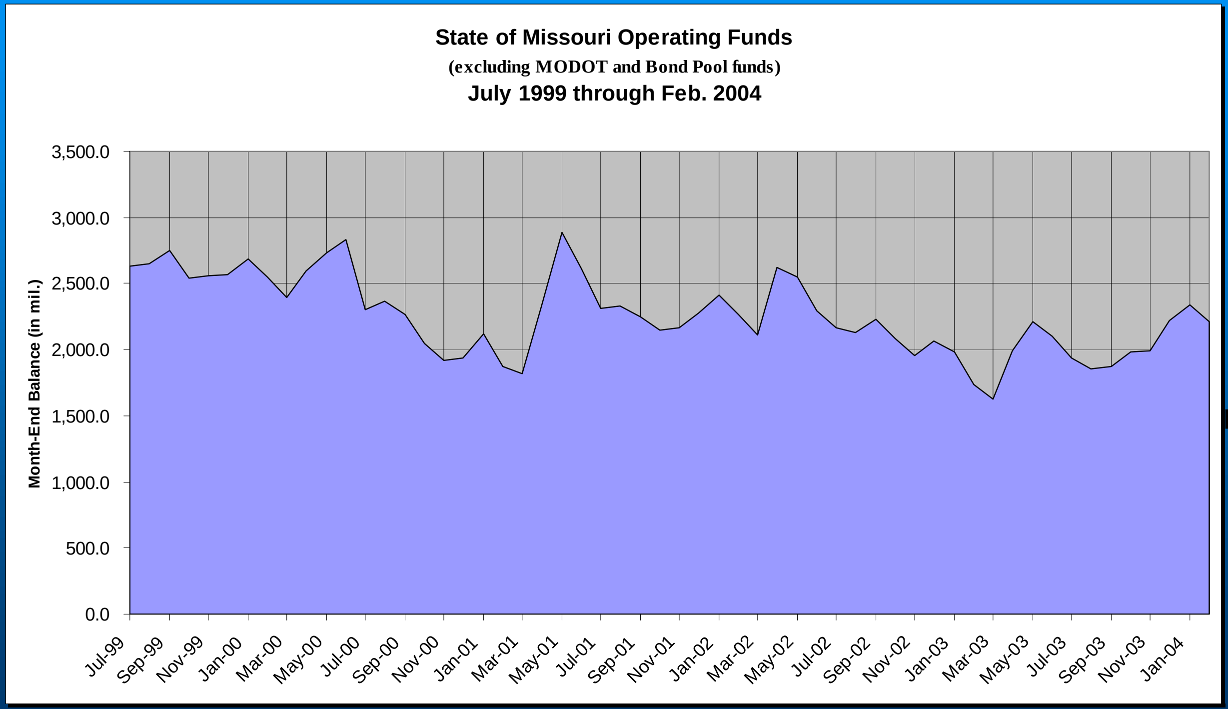
  Prepare a Cash Flow Forecast so you are not forced to sell securities.
- If you already prepare a cash flow forecast, revise it to reflect economic downturn.
- Model your portfolio's liquidity assuming <u>none</u> of your callable bonds are called.

Cash Flow Forecasts

- Cash flow forecasts are the key to understanding your liquidity needs versus "surplus cash"
- For some, cash flow disbursement dates may drive investment maturities
- Others may choose to prepare an actual cash flow forecast
  - "Macro"-level forecast
  - Detailed forecast

Cash Flow Forecasting
(Historic Cash Flow Analysis)

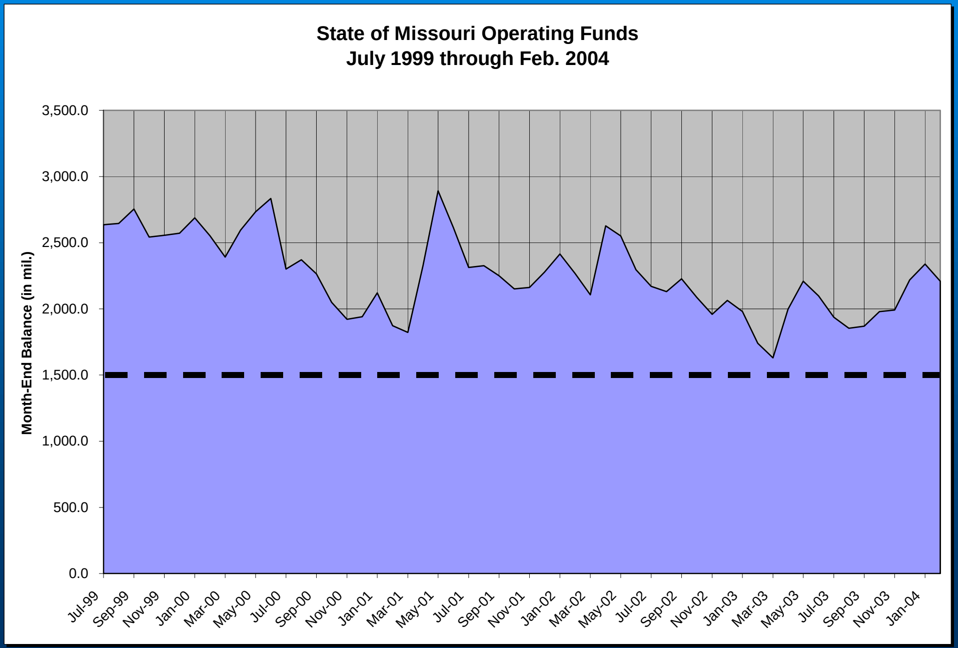
- State Treasurer's Office plotted its monthly fund balances over last 4 years



Cash Flow Forecasting

(Core versus Liquidity)

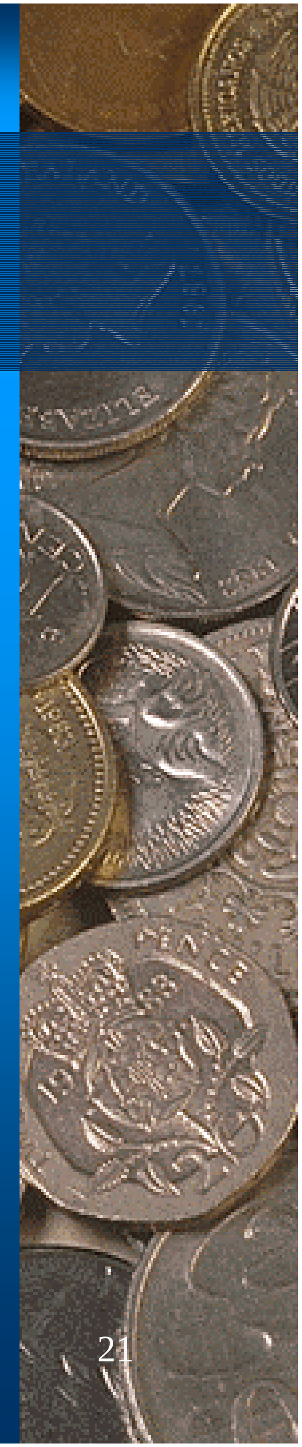
- Our core balance (the amount that we never dipped below) was $1.5 billion
- This figure is theoretically the amount of funds we can place up to our legal maximum maturity.



State Treasurer’s Monthly Liquidity Report

Liquidity Analysis
(in millions)

Month (a)	Opening Liquidity (b)	Gen Rev Fund Inflows/ (Outflows) (c)	Other Funds Inflows/ (Outflows) (d)	General Pool Inflows/ (Outflows) (e = c + d)	Maturities (f)	Excess/ (Shortfall) (g = f + e)	Ending Liquidity (h = b + g)
Sep-08	167.60	25.75	(110.72)	(84.97)	135.82	50.85	218.45
Oct-08	218.45	(203.49)	125.94	(77.55)	158.62	81.08	299.52
Nov-08	299.52	(102.09)	(111.06)	(213.15)	110.77	(102.38)	197.14
Dec-08	197.14	(23.31)	(50.31)	(73.62)	63.42	(10.20)	186.94
Jan-09	186.94	22.85	119.50	142.35	130.74	273.09	460.03
Feb-09	460.03	(272.89)	(43.35)	(316.24)	164.67	(151.57)	308.46
Mar-09	308.46	(143.86)	(5.59)	(149.45)	136.76	(12.70)	295.76
Apr-09	295.76	511.87	151.17	663.04	64.84	727.88	1,023.64



Interest Rate Risk

Issue

- How do I structure my portfolio to protect against falling rates?
- Are there techniques or portfolio strategies I can use to dampen volatility?
- What measures can I use to assess my portfolio?

Solution

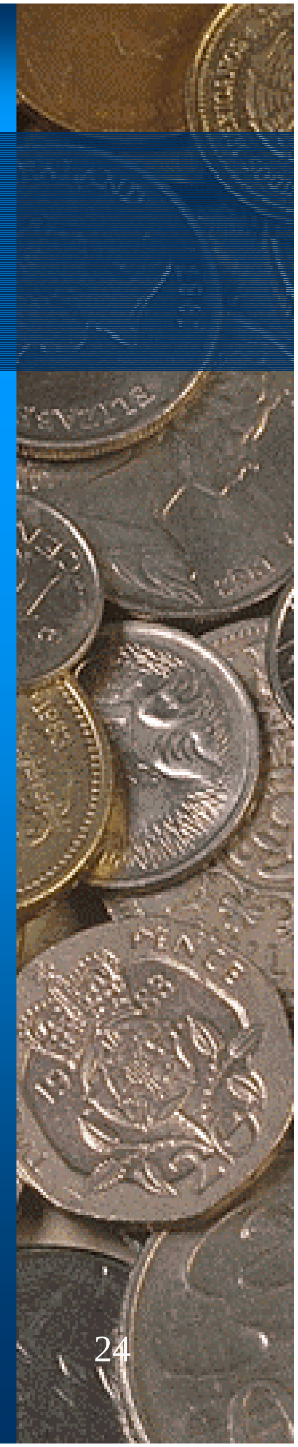
- Split portfolio into multiple portfolios
- Set target duration for portfolio
- Match portfolio to expected cash flow requirements
- Look at WAM and duration

Options for Structuring Portfolio

- Separate short-term and core portfolio
  - Short-Term Portfolio – matched against disbursements and/or monthly changes in balances
  - Reserve Portfolio – surplus funds
- Establish a portfolio for other funds that have distinct cash flows (bond proceeds)
- Set target duration for portfolio

Duration & WAM

- WAM – weighted average maturity
  - Fine for noncallable securities
- Duration – weighted average maturity of present value of cash flows of a portfolio
- The longer a security and/or the lower the coupon, the greater the volatility of that security's value
- Portfolio with duration > 1.5 will have much greater chance of below-average quarters but only incrementally higher yield



Passive Investment Strategies

- Matching
  - Match maturity date of security to disbursement date
- Laddered maturities
  - Instead of investing all of your money to the furthest possible date, “ladder” funds to multiple intermediate dates
  - If rates rise, you will be able to re-invest on those intermediate dates at higher yields
- Rolling purchases
  - Purchase a set amount of securities (e.g., 2-year Treasuries) at regular intervals
  - Generates an average market return

Reinvestment Risk

Issue

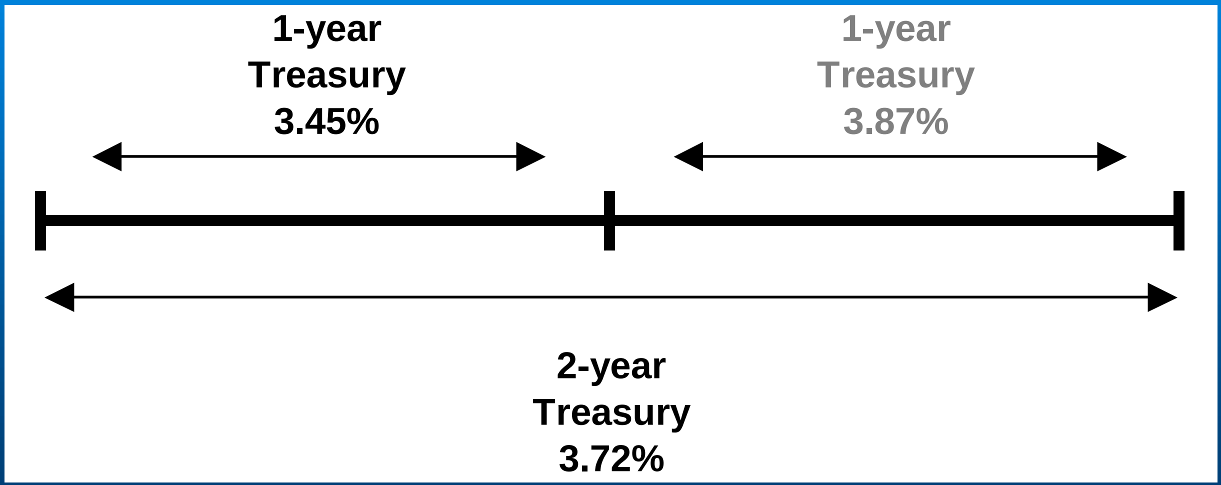
- Callable bonds purchased at par may be called as rates fall. Your reinvestment yield will then be lower at that time.
- How do I analyze my investment opportunities – should I stay short or go longer?

Solution

- Limit exposure to callable securities
- Only buy par-ish callables when you are paid well to do so.
- Emphasize one-time calls versus American & Bermuda calls
- Perform “gap” analysis when considering different bonds

Investment Analysis
(Gap Analysis)

- In gap analysis, we compare two investment periods
- We ask ourselves what rate would we need to earn in the second half of the investment period to generate the same income as investing to term.



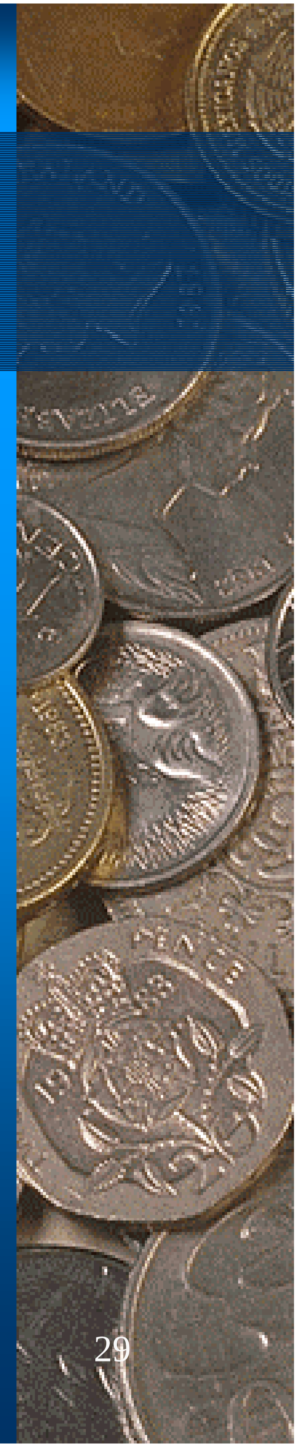
Investment Analysis

(Multi-step Gap Analysis)

- We compute the break-even yield we would earn staying short (in overnight investments) versus investing to a specific term

Current Fed Funds Rate:	2.75%		
FOMC Meeting Date	Fed Funds Rate	MMY during the Prior Period	Cash at End of Period
5/3/2005	3.00%	2.75%	$ 10,016,806
6/30/2005	3.25%	3.00%	$ 10,065,220
8/9/2005	3.50%	3.25%	$ 10,101,567
9/20/2005	3.75%	3.50%	$ 10,142,815
11/1/2005	4.00%	3.75%	$ 10,187,190
12/13/2005	4.25%	4.00%	$ 10,234,730
2/2/2006	4.25%	4.25%	$ 10,296,351
3/15/2006	4.25%	4.25%	$ 10,346,189
Break-Even Point (Bond equiv yield)			**3.738%**

Internal Risk



Issue

- As times become tough, does staff have a greater temptation to take from the till?
- Ethical Lapses

Solution

- Segregation of duties
  - Trading vs. accounting
  - Wire processing
- Auditing
  - Broker confirms
  - Documentation of trades
  - Review of all trades
- Ethics Policy

Credit/Default Risk

Issue

- Are my deposits with banks safe?
- Should I invest in commercial paper?
- How safe are US Agency securities?

Solution

- Make sure that all deposits are properly collateralized and that you have a process for tracking collateral
- FDIC has recently raised FDIC insurance limits from $100,000 to $250,000
- See commentary on specific asset classes that follows in this presentation.

Summary of Risk Control Measures

Liquidity Risk

- Avoid having to sell securities in this market (other than US Treasuries which remain very liquid)
- Match portfolio to expected cash flow requirements
- Purchase securities with an active secondary market

Credit / Reinvestment Risk

- Diversification - Spreading funds among several classes of investments with varying maturities and yields.
  - Establish sector limitations
  - Introduce maximum maturity limits
  - Diversify by issuer
- Monitor Credit Quality
- Limit exposure to callable securities

Summary of Risk Control Measures

Reinvestment Risk

- What-if/gap analysis

Interest Rate Risk

- Consider the use of an investment benchmark or target duration for investment of surplus funds

Part II

Market Commentary on Specific Asset Classes

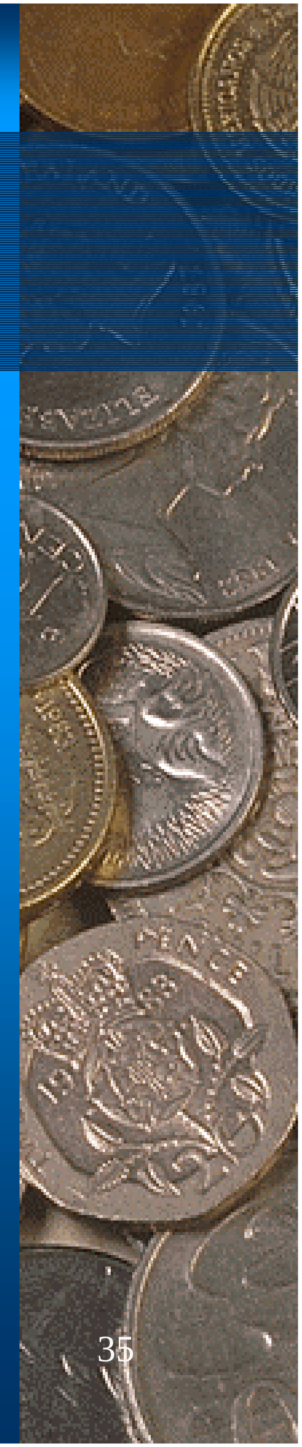
CAUTION: Information may be dated past early November 2008.

US Agency Debt

- Four Main Government Sponsored Enterprises (GSE’s):
  - Fannie Mae (FNMA)
  - Freddie Mac (FHLMC)
  - Federal Home Loan Bank (FHLB)
  - Federal Farm Credit Bank (FFCB)
- Debt includes:
  - Mortgage-backed Securities (FNMA, FHLMC)
  - Senior debt/debentures (including discount notes)
  - Subordinated debt/debentures (FNMA, FHLMC)

Fannie Mae & Freddie Mac

- FHFA, the new regulator of the housing GSE's, place Fannie Mae and Freddie Mac into conservatorship in Sep.
  - In conservatorship, the companies continue to operate with the powers of the directors, officers and shareholders transferred to the conservator.
- Suspended dividends on GSE's common and preferred stock
- US government will back holders of Agency MBS, senior debt and subordinated debt

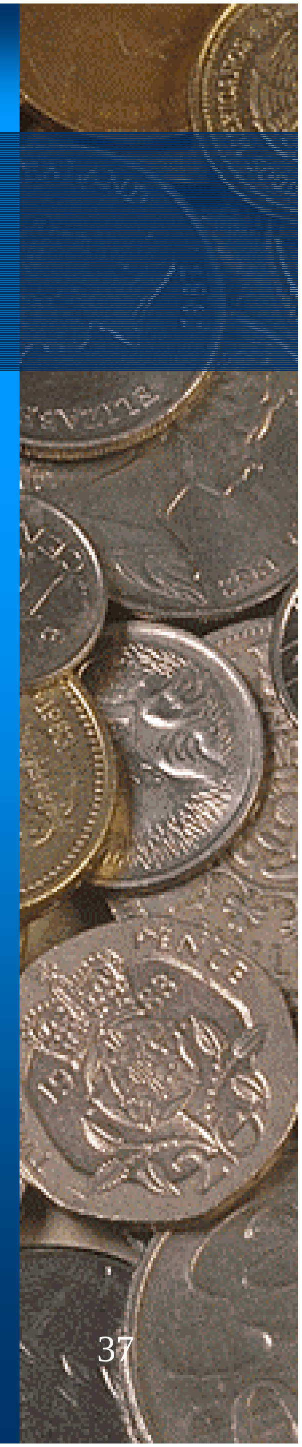


Fannie Mae & Freddie Mac
(Continued)

- Senior Preferred Stock Purchase Agreement
  - Government can purchase up to $100 bil in senior preferred stock per company
  - Government has a 79.9% ownership stake in each company
- GSE Credit Facility
  - A senior credit facility was created to allow the GSE's to borrow on a collateralized basis in the event of a liquidity emergency
  - Expires on 12/31/09
- GSE MBS Purchase Program
  - Treasury will make monthly purchases of MBS in the open market.
  - Also expires on 12/31/09

Fannie Mae & Freddie Mac
(Continued)

- Freddie and Fannie are allowed to grow over the next 1-2 years but then their loan portfolios are supposed to shrink
- Bottom Line
  - Conservatorship period is open ended.
  - Ultimate fate of Fannie and Freddie is left to new President and Congress
  - Hard for us to see the GSE’s privatized by 12/31/09 when the credit facility ends
  - If the GSE’s are privatized, debt they have issued to date would likely be “grandfathered” as GSE debt (similar to Sallie Mae debt)

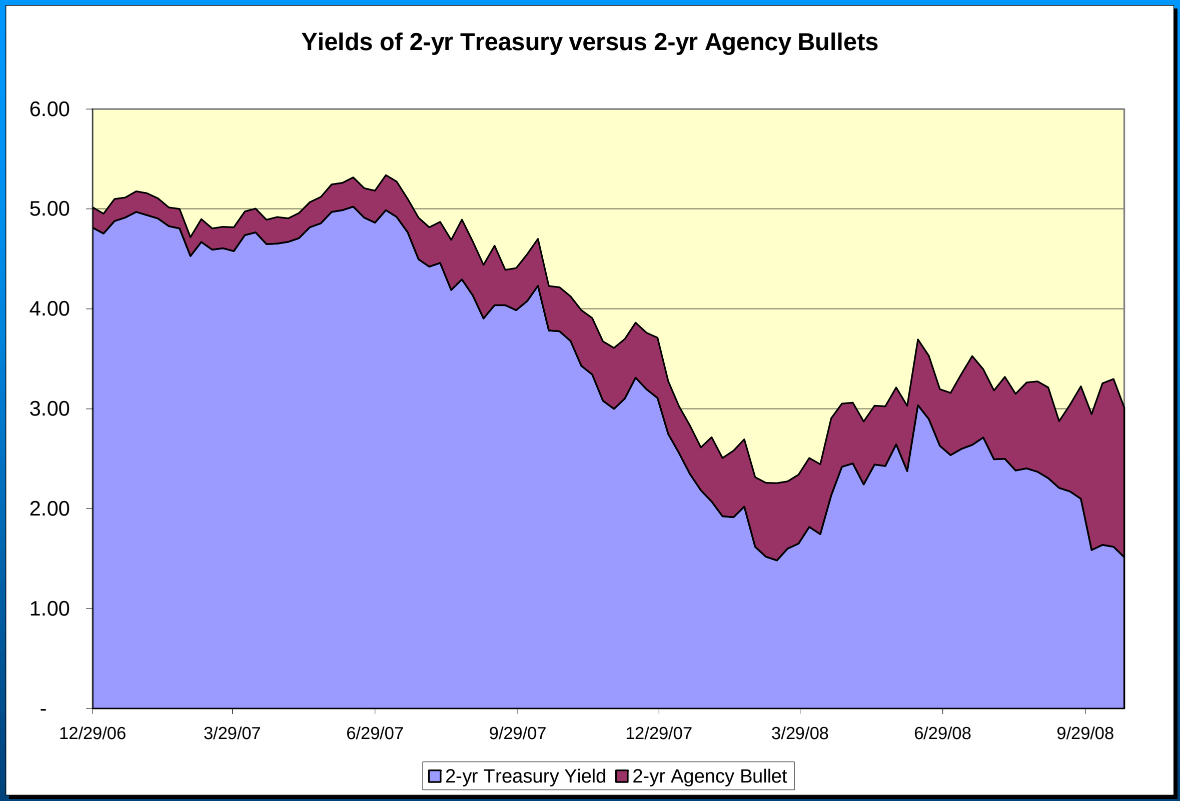


Federal Home Loan Bank

- Created by Congress in 1932
- 8,100 members in the system, primarily commercial banks and thrifts. Each member is a shareholder in one of the 12 regional Federal Home Loan Banks.
- FHLB provides loans/advances to its member banks and funds these loans by issuing debt at a cheaper level in the bond markets
- All loans and advances to member banks are collateralized (with securities and individual loans/mortgages)

Non-Callable Agency Bonds
(a.k.a. "Bullets")

- Spreads for Agency securities have climbed from a low of 20bp in 2006 to more than 150 bp.



Callable Agency Securities

- Set a maximum allocation of callables (15%-25%)
- Understand the call types
  - European (one-time), American (continuous), Bermuda (quarterly/semi-annual)
  - We strongly prefer Euro calls
- Diversify call & maturity dates
  - Avoid all of your callables being called on same date or maturing in the same period
- Consider high-coupon “cushion” callables in low-interest rate environment

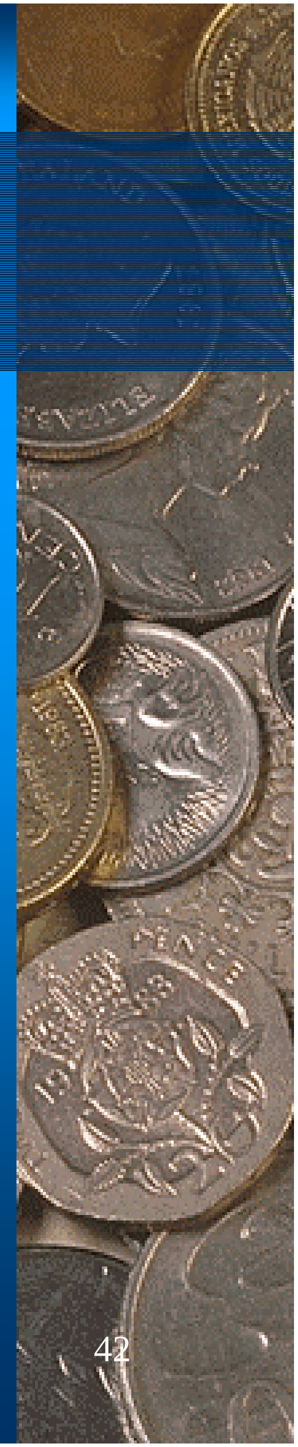
Commercial Paper

- Traditional, non-ABCP commercial paper is unsecured short-debt debt issued by a corporation to cover cash flow needs (i.e., working capital)
- New Federal Programs to Support CP Market
  - Commercial Paper Funding Facility (CPFF)* – Fed Reserve buys 3-month A1/P1/F1 CP from companies
  - Asset-backed Commercial Paper Money Market Liquidity Program (AMLF)/Money Market Investor Funding Facility (MMIFF)
  - Temporary Liquidity Guarantee Program* – FDIC insures senior debt (including CP) for next three years

* Eligible companies must apply for admission to these programs. Participating institutions must pay a fee.

Commercial Paper (Cont'd.)

- Only buy commercial paper (CP) if you have the time to track financial information on each issuer
  - Monitor current news on a daily or weekly basis
  - Credit Agency Reports/Changes
  - Company Financials
- Use of <u>Short</u> Pre-Approved Buy List
- Sector/Industry Outlook
  - State Treasurer's Office avoids C/P of any sector experiencing volatility or damage (financial sector)
- We do not recommend C/P in this environment to any agency that has not purchased it before.

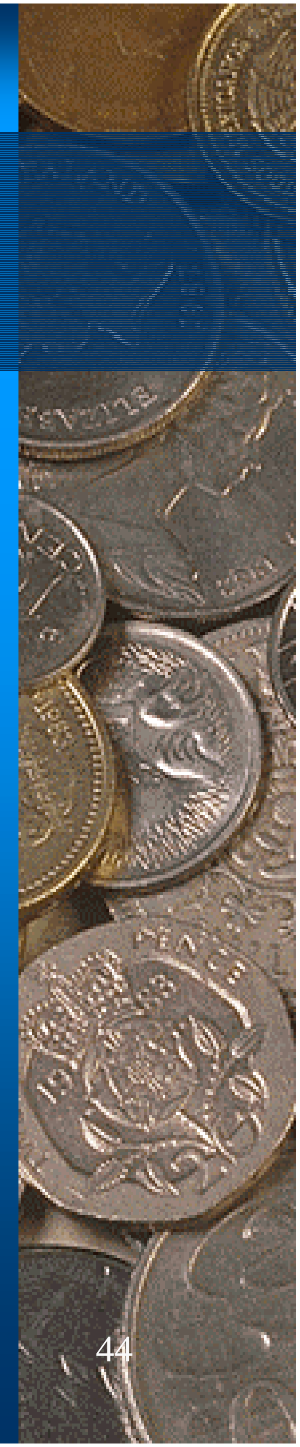


Commercial Paper (Cont’d.)

- State Treasurer’s Office Policies/Practices:
  - Have avoided all Asset-Backed Commercial Paper (ABCP) programs since 2007
  - Have never purchased <u>partially</u> supported ABCP or securities arbitrage programs
  - Purchases are contained to non-finance, industrial/service US corporations (e.g., Emerson Electric, Procter & Gamble, IBM, Coca Cola, 3M, Wal-Mart, Sigma-Aldrich)
  - Currently limiting ourselves to 30-60 day maturities

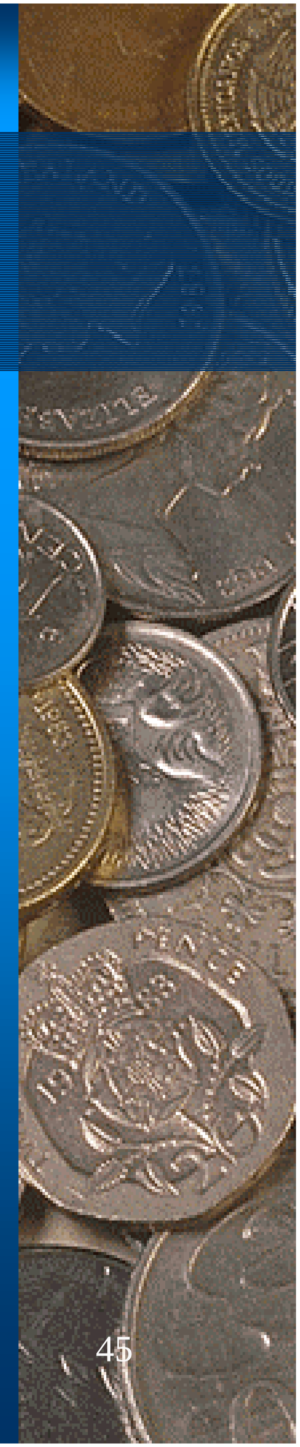
Commercial Paper (Cont'd.)

TK	Company	Industry Sector	S-T Debt	Cash	Debt Due/Cash
MON	MONSANTO CO	Basic Materials	24	1,613	0.01
EL	ESTEE LAUDER	Consumer, Non-cyclical	119	402	0.30
CL	COLGATE-PALMOLIV	Consumer, Non-cyclical	255	623	0.41
DIS	WALT DISNEY CO	Communications	2,050	2,589	0.79
EMR	EMERSON ELEC CO	Industrial	1,732	2,057	0.84
WMT	WAL-MART STORES	Consumer, Cyclical	6,851	6,907	0.99
MMM	3M CO	Industrial	2,257	2,240	1.01
DHR	DANAHER CORP	Industrial	316	287	1.10
KO	COCA-COLA CO	Consumer, Non-cyclical	8,647	7,797	1.11
HON	HONEYWELL INTL	Industrial	3,230	2,292	1.41
3091Z	CARGILL	Consumer, Non-cyclical	6,427	3,898	1.65
IBM	IBM	Technology	16,181	9,755	1.66
SIAL	SIGMA-ALDRICH	Basic Materials	413	221	1.87
PG	PROCTER & GAMBLE	Consumer, Non-cyclical	13,084	3,313	3.95
ADM	ARCHER-DANIELS	Consumer, Non-cyclical	3,355	810	4.14
CAT	CATERPILLAR INC	Industrial	14,370	2,138	6.72
T	AT&T INC	Communications	17,419	1,594	10.93
PRU	PRUDENTL FINL	Financial	21,942	9,943	2.21
JPM	JPMORGAN CHASE	Financial	489,213	54,350	9.00
C	CITIGROUP INC	Financial	639,093	62,951	10.15
BAC	BANK OF AMERICA	Financial	439,770	39,341	11.18
GE	GENERAL ELECTRIC	Industrial	204,837	18,989	10.79
MWD	MORGAN STANLEY	Financial	405,300	23,702	17.10
MER	MERRILL LYNCH	Financial	535,094	31,211	17.14
GS	GOLDMAN SACHS GP	Financial	455,658	12,160	37.47



Money-Market Mutual Funds
(Cities Only)

- Characteristics of 2a-7 funds
  – Regulated under Rule 2a-7 of the Investment Company Act of 1940 / Registered with SEC
  – Maximum WAM of 90 days, no investment longer than 397 days
  – Top tier investments
  – Attempt to keep their net asset value (NAV) at a constant $1.00 per share – do not "break the buck"
- Types – each type below may be unrated or rated
  – Treasury Obligations Funds
  – Government Obligations Funds
  – Prime Obligations Funds



Money-Market Mutual Funds

(Cities Only)

- Until recently, the difference in yield between Government Obligations and Prime Obligations funds in the same fund family might be 1-30 bp
- New Federal Programs to Support Industry
  - Temporary Guarantee Program for MMF's* – US Treasury guarantees investments for amounts held in participating funds as of 9/19/08
  - Asset-backed Commercial Paper Money Market Liquidity Program (AMLF) – MMF's may sell back A1/P1 asset-backed commercial paper

* Eligible companies must apply for admission to these programs. Participating institutions must pay a fee.

A Look Ahead….

- What we know
  - – Amount of issuance of Treasury Debt will increase significantly to pay for these new programs
  - – FOMC is unlikely to significantly raise rates in the short-term
- What we don't know
  - – Severity and length of current recession both in US and globally
  - – Future role of Fannie Mae & Freddie Mac
  - – Level of Deflation/Inflation
  - – Who survives and who thrives

A Look Ahead….

- What we don’t know (continued)
  - Short- to intermediate-term effects of new programs introduced so far
    - Does Fed pick winners and losers in the banking sector?
    - Are new programs successful in thawing credit freeze?
    - Are there unintended consequences of these new programs?
  - New or expanded programs introduced by a new President and Congress in 2009 and beyond
  - Long-term effects of the US government’s support of US banks and businesses

Investing Truisms

- "There's no such thing as a free lunch"
- "If it seems too good to be true, it is"
- "You don't get something for nothing"
  - If you see a high-yielding investment, there's a reason -- the issuer has to offer a higher yield due to the perception of increased risk
- Do not risk incremental yield if one default would wipe out years of incremental income
- Do not stretch for yield by taking careless risks

For Further Reference

- If you have further questions or need assistance, consult:
  - Your counsel
  - State Treasurer's Office
    - Mark Mathers, Director of Investments
      (573) 751-8530 or mark.mathers@treasurer.mo.gov
  - GFOA
    - "Investing Public Funds"
    - www.gfoa.org - see Recommended Practices link
  - Websites
    - www.Investinginbonds.com
    - www.bloomberg.com