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# SFGFOA Annual Finance & Investment Seminar

## A Primer on Fixed Income Securities

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Thursday, August 18, 2016

➤ A BNY MELLON COMPANY<sup>SM</sup>



# Presentation agenda

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- **Bond Fundamentals**
  
- **Types of Bonds**
  - treasury
  - agency / instrumentalities / GSE / MBS
  - supranational
  - commercial paper/corporate notes
  - certificates of deposit
  - money market mutual funds/Local Government Investment Pools (LGIPs)



## Fixed income securities – a review

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## Primary risks

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### **Credit Risk**

- Risk that the issuer of the security will be downgraded or default on the security

### **Market Risk**

- Sensitivity of the security to interest rate changes

### **Liquidity Risk**

- Ability to sell the security in the secondary market

# Primary vs. secondary markets

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## Primary Market

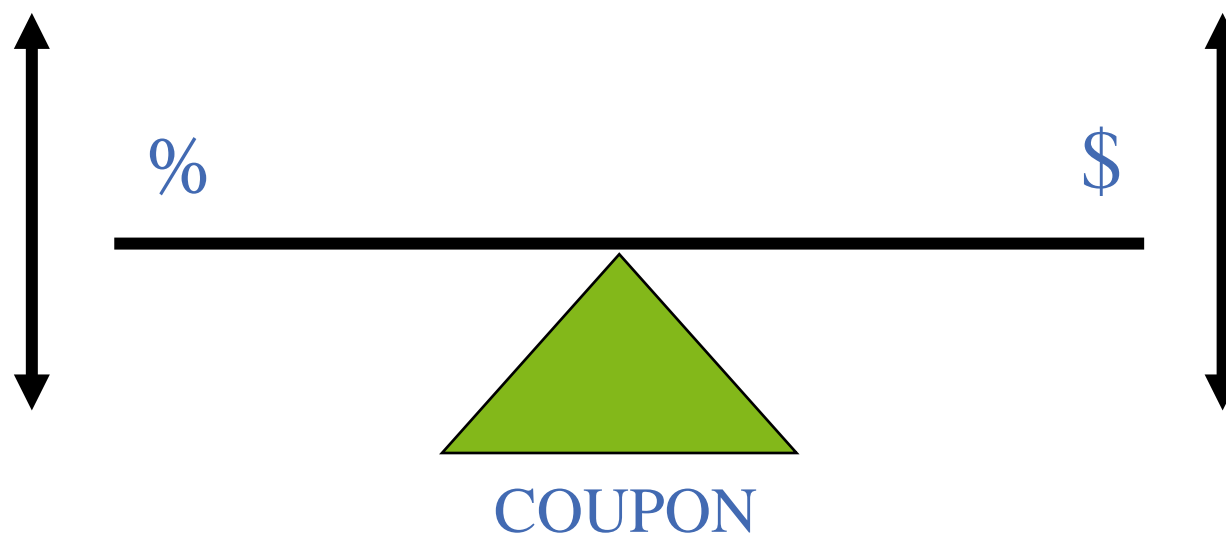
- Market in which securities are originally issued

## Secondary Market

- Market where securities trade after they are issued but prior to their maturity\*

\* This market may be cheaper than new issues.

## Prices and yield move inversely



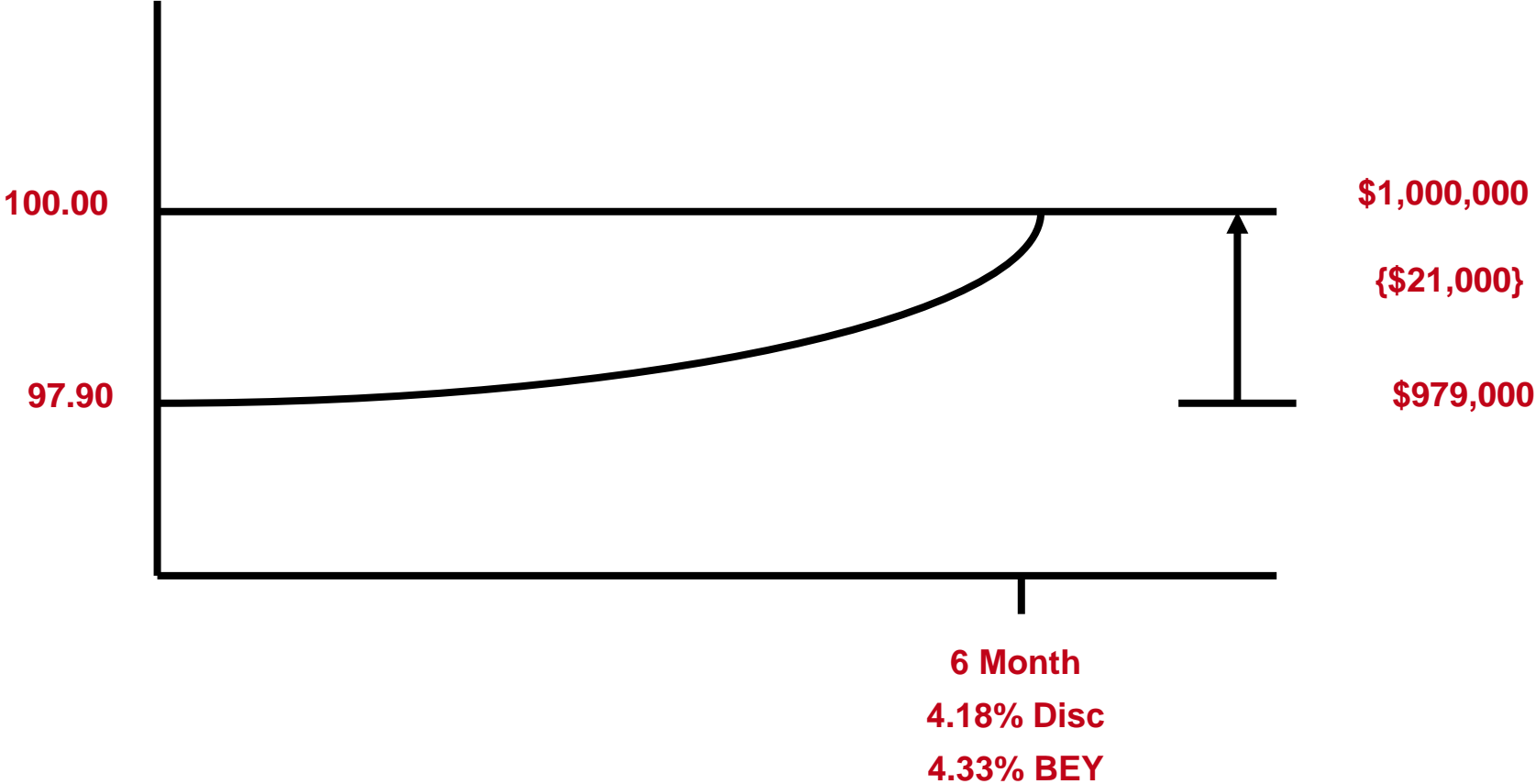
**Par**: Amount that will be repaid by the issuer at maturity

**Premium**: If the purchase price is greater than par value (Current Yield < Coupon)

**Discount**: If the purchase price is less than par value (Current Yield > Coupon)

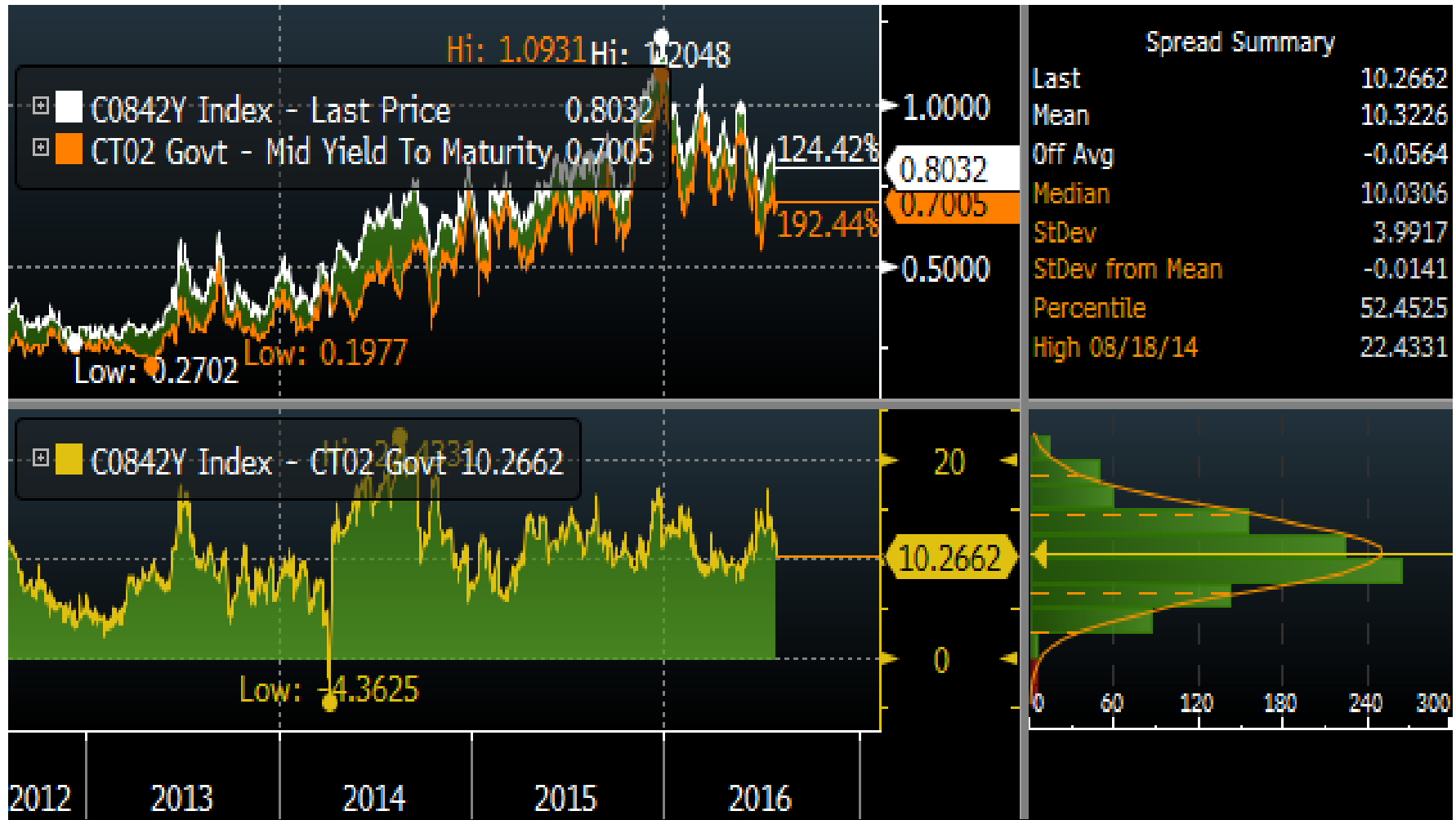
For illustrative purposes only.

# Original issue discount



For illustrative purposes only.

# Significance of spread



Source: Bloomberg, as of August 2, 2016.



## Types of securities

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- Treasury securities
- Agency / Instrumentality securities
- Supranational securities
- Corporate securities
- Certificates of deposit
- Money market funds / LGIPs

# Treasury securities

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## **Virtually credit risk free**

- Backed by full faith and credit of US government
- Market risk

## **Potential for excellent liquidity**

- Each issue \$12 to \$24 billion range
- Primary dealers

## **Standardization**

- Coupon and maturity
- Auction schedule

## **Benchmarks for fixed-income securities**

## Treasury bills

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- Maturities of 1 year or less
- 3- and 6-month auctioned every Monday
- 4-week and 1-year bills auctioned on Tuesday
- Mature Thursdays, unless it's a holiday
- Trade at discount to par
- No coupon
- Actual/360 basis

## Treasury notes and bonds

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- Notes
  - original maturity of 10 years and under
- Bonds
  - original maturity >10 years, up to 30 years
  - STRIPS: Separate Trading of Registered Interest and Principal
- Mature either the 15th or last day of the month
- Semi-annual fixed coupons
- Interest calculated on actual/actual basis

## Current treasury issues

<b>Maturity</b>	<b>Auction</b>	<b>Minimum/Multiple</b>
1-month	Every Tuesday	\$1,000/1,000
3-month	Every Monday	\$1,000/1,000
6-month	Every Monday	\$1,000/1,000
1 year	Every Mon	\$1,000/1,000
CMB	As needed	\$1,000/1,000
2, 3, 5, 7-year	Every month	\$1,000/1,000
10-year	Feb, May, Aug and Nov	\$1,000/1,000
30-year	Feb, May, Aug and Nov	\$1,000/1,000

As of May 2016. For illustrative purposes only.

## Primary dealer list

[www.newyorkfed.org](http://www.newyorkfed.org)

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- Bank of Nova Scotia, New York Agency
- BMO Capital Markets Corp.
- BNP Paribas Securities Corp.
- Barclays Capital Inc.
- Cantor Fitzgerald & Co.
- Citigroup Global Markets Inc.
- Credit Suisse Securities (USA) LLC
- Daiwa Capital Markets America Inc.
- Deutsche Bank Securities Inc.
- Goldman, Sachs & Co.
- HSBC Securities (USA) Inc.
- Jefferies & Company, Inc.
- J.P. Morgan Securities LLC
- Merrill Lynch, Pierce, Fenner & Smith Incorporated
- Mizuho Securities USA Inc.
- Morgan Stanley & Co. LLC
- Nomura Securities International, Inc.
- RBC Capital Markets, LLC
- RBS Securities Inc.
- Societe Generale, New York Branch
- UBS Securities LLC.
- Wells Fargo Securities, LLC

Source: [www.newyorkfed.org](http://www.newyorkfed.org), as of May 2016.

## US agencies securities

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- Government National Mortgage Association (GNMA)
- Farmers Home Administration (FMHA)
- Small Business Association (SBA)
- General Services Administration (GSA)
- Federal Housing Administration (FHA)
- Housing and Urban Development (HUD)

## US agencies securities

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- Backed by the full faith and credit of the US government
- Most not considered money-market instruments
- Most are not active; therefore, the quotes, except for GNMA's are not widely published
- Some are Fed wireable



## Instrumentality securities

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- Federal National Mortgage Association (FNMA)
- Federal Farm Credit Banks (FFCB)
- Federal Home Loan Banks (FHLB)
- Federal Home Loan Mortgage Corporation (FHLMC)

## Instrumentality characteristics

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- Government sponsored corporations (GSE)
- Often referred to as “agencies”
- No explicit government guarantee, although implied government assistance
- Most are widely traded
- Some are state tax exempt (FFCB, FHLB)

## Instrumentality characteristics

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- Spread over Treasuries
- Liquidity considerations
  - issues size \$10 MM to several billion
- Various structures
  - discount notes, “bullets,” callables, floating rate, step-up callables
- Coupons non-standard (2.17%, 1.83%)
- No predictable issuing schedule
- 30/360 interest calculation

# Instrumentality securities

## Discount notes

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- Discount notes issued by instrumentalities
  - FNMA
  - FHLMC
  - FFCB
  - FHLB
- Purchased at the “window” or secondary through dealer

# Instrumentality securities

## Discount notes

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- **T-Bill similarities**

- maturity - 1 year or under
- no coupon
- discount to par
- actual/360

- **T-Bill differences**

- yield
- liquidity
- days of week mature

# Instrumentality securities

## Coupon

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- Securities that pay periodic interest (similar to Treasury notes or bonds)
- Many different structures
  - quarterly, semi-annually
  - floating rate
  - callable
  - step-up

# Instrumentality securities

## Coupon

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- Similar to Treasury notes and bonds
- Typically pay interest semi-annually
- No predictable issuing schedule
- Coupons non-standard (2.17%, 1.83%)
- 30/360 interest calculation

# Instrumentality securities

## Callable

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- Issuer has right but not the obligation to redeem early
- Usually called at par value
- Investors are paid a higher yield to compensate them for their loss of rights
- Various structures
  - protection period - non-callable
  - different types of calls



## Callable structures

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- One-time (European): Callable one-time only on call date
- Discrete (Bermuda): Callable on certain specified dates (e.g., coupon payment date, monthly, quarterly, annual)
- Continuous (American): Can be called at any time on or after the first call date

## Different structures = different yields

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- The yield of the callable is based on the rights that have been sold
- The more rights you sell, the higher the yield
  - 5 year, non-callable 3 month (one-time) 1.23%\*
  - 5 year, non-callable 3 month (discrete) 1.50%\*
  - 5 year, non-callable 3 month (continuous) 1.58%\*

\* Yields are for illustrative purposes only and are not intended as an offer to buy or sell securities. Yields are based on securities in Wells Fargo Securities' inventory as of July 26, 2016.

# You need information

1) Yield & Spread		2) Yields		3) Graphs		4) Pricing		5) Description		6) Custom		7) Calls	
FHLMC 1 1/2 08/25/20 ( 3134G93R6 )													
Spread	117.48 bp	3m	B 0	10/27/16	Risk		Maturity	OAS					
Price	100.1			0.295	12:44:28	<input checked="" type="radio"/> M.Dur	<input type="radio"/> Dur	3.869	1.378				
Yield	1.474164	Mty		0.299323	Con	Risk		3.873	1.379				
Wkout	08/25/2020	100.00	Consensus	Yld	6 6	Convexity		0.171	-3.089				
Settle	08/25/16			07/27/16		DV	01 on 1MM	387	138				
Spreads		Yield Calculations		Invoice		Benchmark Risk		0.252	0.251				
11) G-Sprd	44.5	Street Convention	1.474164	Face		Risk Hedge		15,388 M	5,483 M				
12) I-Sprd	34.7	Equiv 1 /Yr	1.479597	Principal		Proceeds Hedge		1,002 M					
13) Basis	66.4	Mmkt (Act/ 360 )		Accrued (0 Days)		Invoice							
14) Z-Sprd	33.6	True Yield	1.474117	Total (USD)		Face		1,000 M					
15) ASW	33.0	Current Yield	1.499			Principal		1,001,000.00					
16) OAS	-16.2					Accrued (0 Days)		0.00					
17) TED	-30.7					Total (USD)		1,001,000.00					
After Tax (Inc 43.400 % CG 23.800 %)				0.829395									

Source: Bloomberg, as of July 26, 2016.

# You need information

1) Yield & Spread		2) Yields		3) Graphs		4) Pricing		5) Description		6) Custom		7) Calls	
FHLMC 1 1/2 08/25/20 ( 3134G93R6 )													
Spread	79.96 bp	vs	3mB 0	10/27/16									
Price	100.1			0.295	12:44:28								
Yield	1.098901	Call		0.299323	Con								
Wkout	11/25/2016	@	100.00	Consensus	Yld	6	6						
Settle	08/25/16			07/27/16									
Risk													
M.Dur						Dur		Workout		OAS			
								0.249		1.378			
Risk								0.250		1.379			
Convexity								0.001		-3.088			
DV						01 on 1MM		24.96		138			
Benchmark Risk								0.252		0.251			
Risk Hedge								992 M		5,485 M			
Proceeds Hedge								1,002 M					
Invoice													
Face								1,000 M					
Principal								1,001,000.00					
Accrued (0 Days)								0.00					
Total (USD)								1,001,000.00					
Spreads		Yield Calculations											
1) G-Sprd	76.4	Street Convention		1.098901									
12) I-Sprd	24.9	Equiv 1 /Yr		1.103438									
13) Basis	85.8	Mmkt (Act/ 360 )		1.075012									
14) Z-Sprd	14.2	True Yield		1.098901									
15) ASW	13.8	Current Yield		1.499									
16) OAS	-16.3												
17) TED	-35.5												
After Tax (Inc 43.400 % CG 23.800 %)		0.543656											

Source: Bloomberg, as of July 26, 2016.

# You need information

FHLMC 1 1/2 08/25/20 Corp      97) Settings      Page 10/11      Security Description: Bond

Data not provided by Bloomberg      94) Notes      95) Buy      96) Sell

25) Bond Description      26) Issuer Description

**Pages**

- 11) Bond Info
- 12) Addtl Info
- 13) Covenants
- 14) Guarantors
- 15) Bond Ratings
- 16) Identifiers
- 17) Exchanges
- 18) Inv Parties
- 19) Fees, Restrict
- 20) Schedules
- 21) Coupons

**Quick Links**

- 32) ALLQ Pricing
- 33) QRD Quote Recap
- 34) TDH Trade Hist
- 35) CAC Corp Action
- 36) CF Prospectus
- 37) CN Sec News
- 38) HDS Holders
- 39) VPR Underly Info

66) Send Bond

**Schedules**

Call Schedule

Discrete Call minimum 5 business days notice

Last Call Date 05/25/2020

**Call Frequency Quarterly**

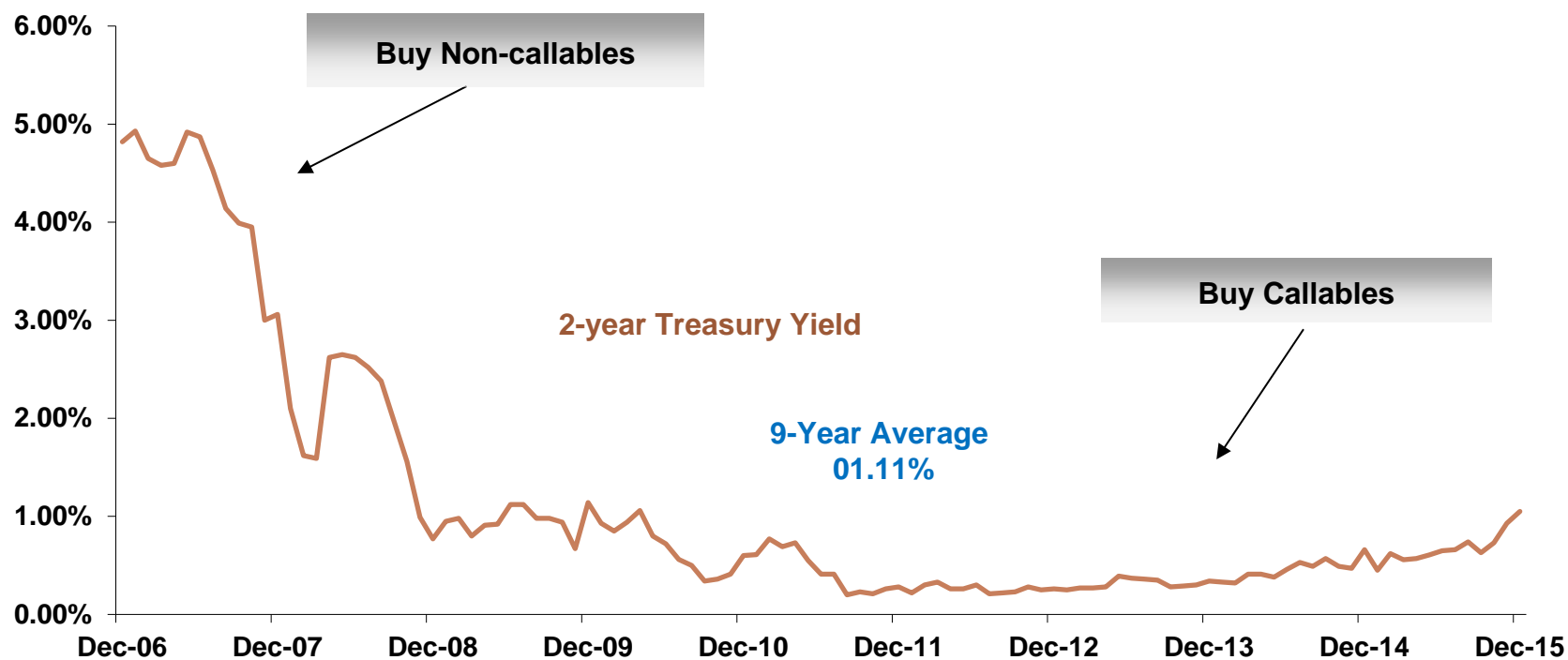
Callable only on date(s) shown

	Date	Price
	11/25/2016	100.000
	02/25/2017	100.000
	05/25/2017	100.000
	08/25/2017	100.000
	11/25/2017	100.000
	02/25/2018	100.000
	05/25/2018	100.000
	08/25/2018	100.000
	11/25/2018	100.000
	02/25/2019	100.000
	05/25/2019	100.000
	08/25/2019	100.000

Source: Bloomberg, as of July 26, 2016.

# Callable timing

- Some market conditions favor callable securities and other conditions favor non-callable securities
- Insight has the resources and experience to know which structures are most likely favorable to the investor



As of December 31, 2015. For illustrative purposes only.

## Instrumentality securities

### Mortgage backed (MBS)

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- These securities are back by a collection of mortgages
- Typically are “pass through”
- Amortizing securities – partial periodic principal repayment
- P&I is guaranteed either by either US government (GNMA) or GSE (FNMA, FHLMC)
- P&I is usually monthly
- Prepayment risk, extension risk, liquidity risk
- Collateralized Mortgage Obligations (CMO)

## 2015 top 10 underwriters of agency/instrumentality securities

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Barclays

JP Morgan

Citi

BNP Paribas Group

Deutsche Bank

Morgan Stanley

Nomura Holdings Inc.

Credit Suisse First Boston

FNT Financial

TD Securities

Source: Bloomberg, as of July 2016.



# Supranational securities



As of July 2016. For illustrative purposes only.

## US ownership

	Percentage of US Ownership	US is X largest Owner	Headquarters
<b>Asian Development Bank</b>	16%	1 <sup>st</sup> (co-largest Japan)	Manila, Philippines
<b>European Bank of Reconstruction</b>	10%	1 <sup>st</sup>	London, UK
<b>Inter-American Development Bank</b>	29%	1 <sup>st</sup>	Washington, DC, USA
<b>International Finance Corporation</b>	24%	1 <sup>st</sup>	Washington, DC, USA
<b>International Bank for Reconstruction</b>	17%	1 <sup>st</sup>	Washington, DC, USA
<b>African Development Bank</b>	7%	2 <sup>nd</sup>	Abidjan, Ivory Coast

Source: The World Bank, as of December 31, 2015.

## Corporate securities

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- Commercial paper
- Medium-term corporate notes
- Asset backed securities (ABS)

## Commercial paper

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- Credit risk
- Unsecured debt
- Highest ratings
  - Moody's: P-1
  - S & P: A-1+
  - Fitch: F-1+
- 270-day maximum maturity
- Discount (most common) or coupon
- Purchased direct or through dealers

## Largest issuers of direct commercial paper

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General Electric Capital Corporation

UBS Finance (DE) Inc.

Toyota Motor Corporation

Deutsche Bank Financial

Societe Generale

Citicorp

Prudential Funding Corporation

American Express Credit Corporation

Source: Bloomberg, as of July 2016.

## Medium-term corporate notes

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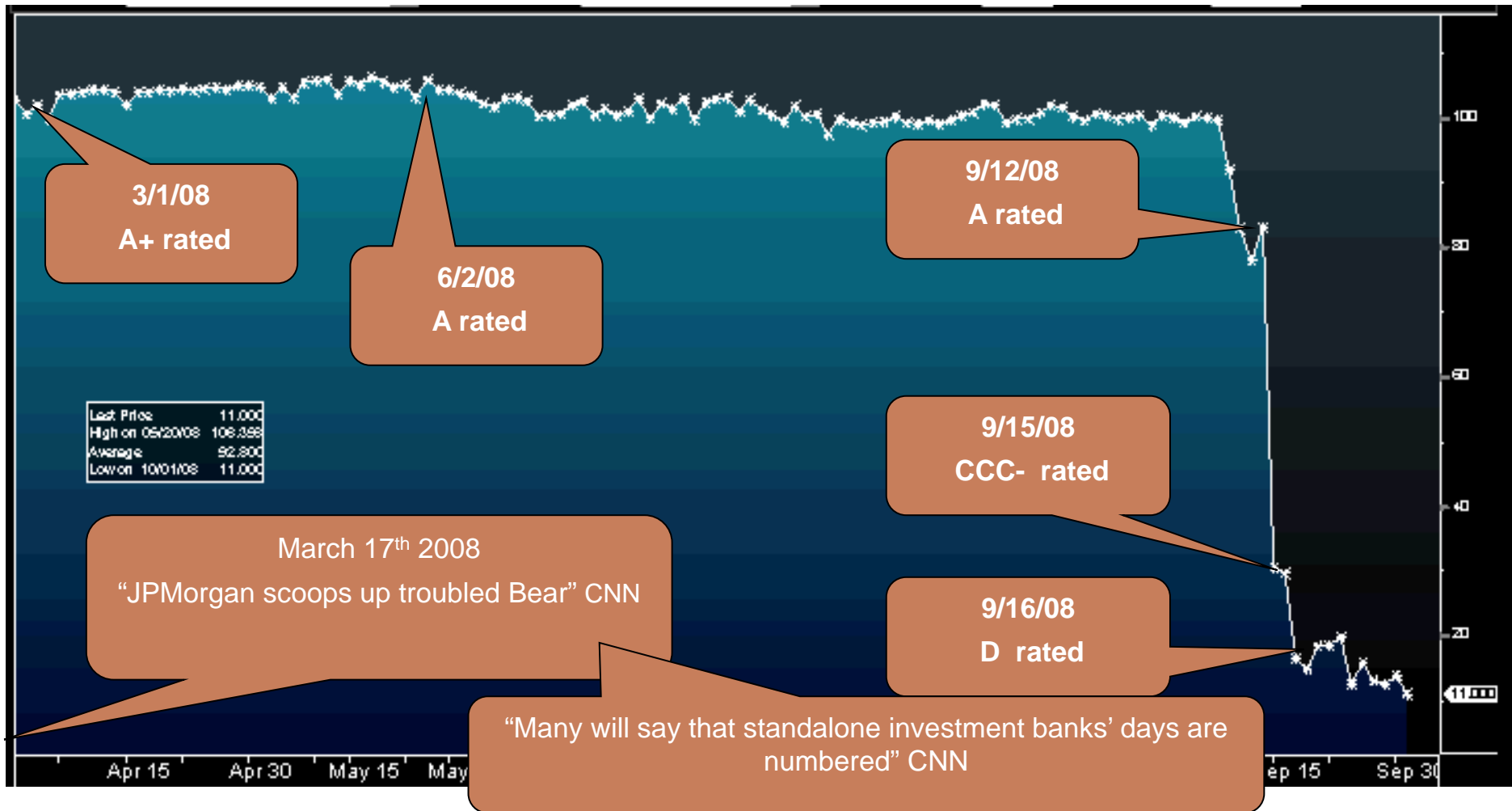
- Credit risk
  - check rating categories
- Higher yields
- Maturity of 5 years or less
- Coupon securities – Semiannual
- Usually not callable
- Purchased through Broker/Dealers or New Issues
- DTC eligible

## Asset backed securities (ABS)

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- Corporate bond – backed with non-mortgage loans
  - auto Loans
  - home equity loans
  - credit card loans
- Credit risk
  - non-idiosyncratic risk
  - credit enhancements
    - substitution
    - over collateralization
    - subordination – credit tranching
- Higher yields
- Maturity of 5 years or less
- Amortizing security with monthly P&I payments
- Illiquid with prepayment risk

# Continuous credit analysis



Source: Bloomberg, as of September 2008 and CNN, as of March 2008.



# Continuous credit analysis

## Lehman Brothers stock



Source: Bloomberg, as of September 2008. For illustrative purposes only.

## Corporate securities policy

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### Compile a list of pre-approved issuers

- Establish a minimum credit rating
  - limit commercial paper purchases to A1/P1/F1
  - MTN - require a long-term debt rating of at least A and AA is better
- Limit purchases to issuers with at least \$500 million in total assets
- Monitor trends in issuer's financial condition
  - 10-K, 10-Q and rating agency reports

### Develop a strategy for negative trends

- Do not purchase securities on a watch list
- Review current exposure
- Make hold or sell decision

# 2016 top 10 underwriters of corporate debt

## Investment grade

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JP Morgan

Bank of America

Citi

Morgan Stanley

Goldman Sachs

Barclays

Deutsche Bank

Wells Fargo

HSBC

RBS

Source: Bloomberg, as of July 2016.

# Certificates of deposit

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## **Non-negotiable**

- No secondary market
- Redemption penalties
- \$100,000 FDIC insurance
- Collateralized

## **Negotiable CDs**

- Secondary market
- \$1 million blocks
- May or May not be collateralized

## **Government Finance Officers Association recommended practice**

## Money market mutual funds

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- Commercially operated pooled liquid assets
- Legal structure
  - sponsored by private companies
  - used by variety of institutional investors
  - could include investments not authorized for entity
  - most regulated and registered with SEC
  - Rule 2a-7 governs credit quality, diversification, maturities,
    - stable NAV of \$1.00 for government funds
    - floating NAV for any fund with corporate exposure

# LGIPs

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- **Combines liquid assets of numerous public entities**
  
- **Two general types**
  - state-operated pools
  - intergovernmental pools
  
- **Questions to ask**
  - does the pool follow SEC Rule 2a-7?
    - 60 day WAM
    - maturity limit to 1 year on non-floating assets
    - higher credit quality securities
  - is the pool rated AAAm\*? or AAAf\*?
  - what are the cut-off times for contributions and withdrawals?
  - does the pool offer Internet access?
  - does the pool offer ACH transactions?

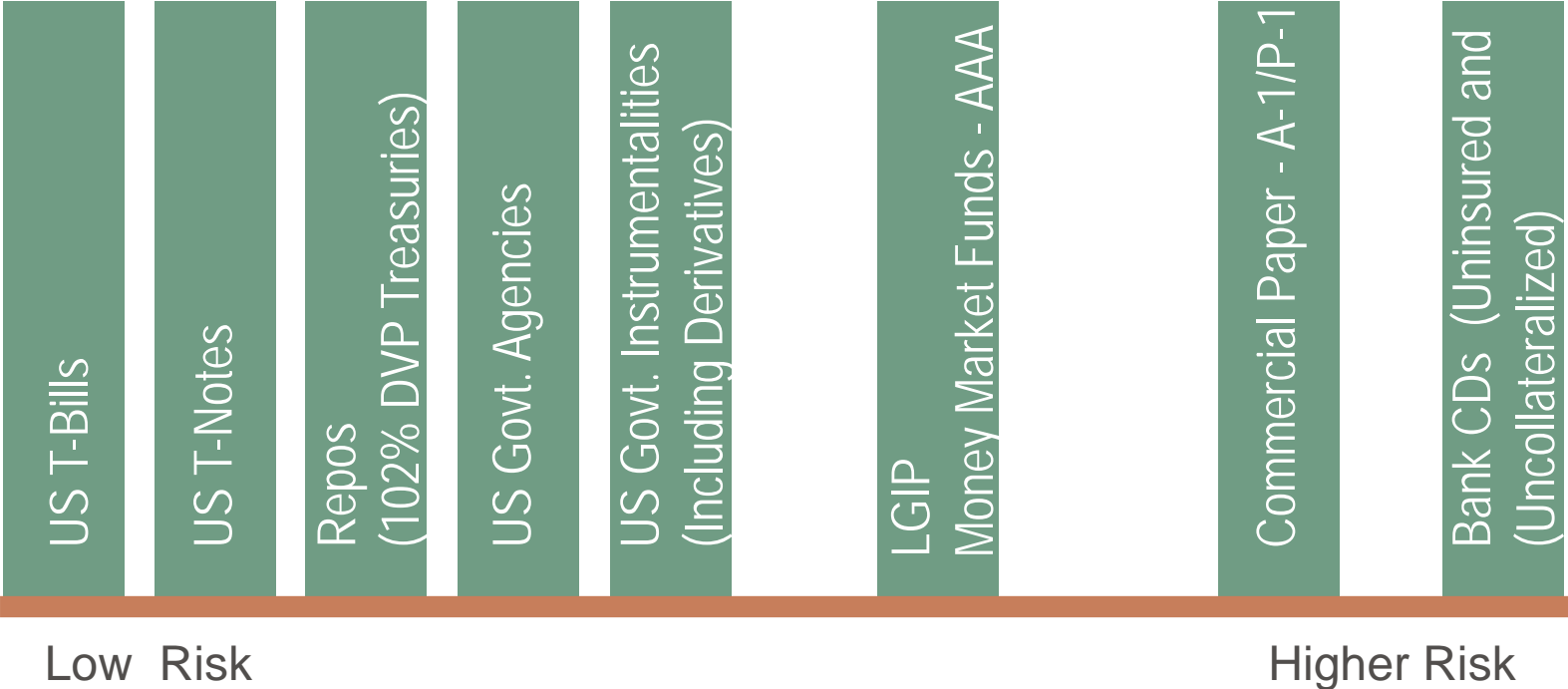
\* m = money market, f = floating.

## Evaluating investment options

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- Who is the issuer?
- What is the term of the investment?
- What are the sources of income?
- What are the sources of risk?
  - credit risk
  - market risk
  - liquidity risk
- Are there any administrative considerations?
  - calculation of interest
  - issuance schedule
  - monthly P&I – reinvestment risk

# Credit default risk



For illustrative purposes only.

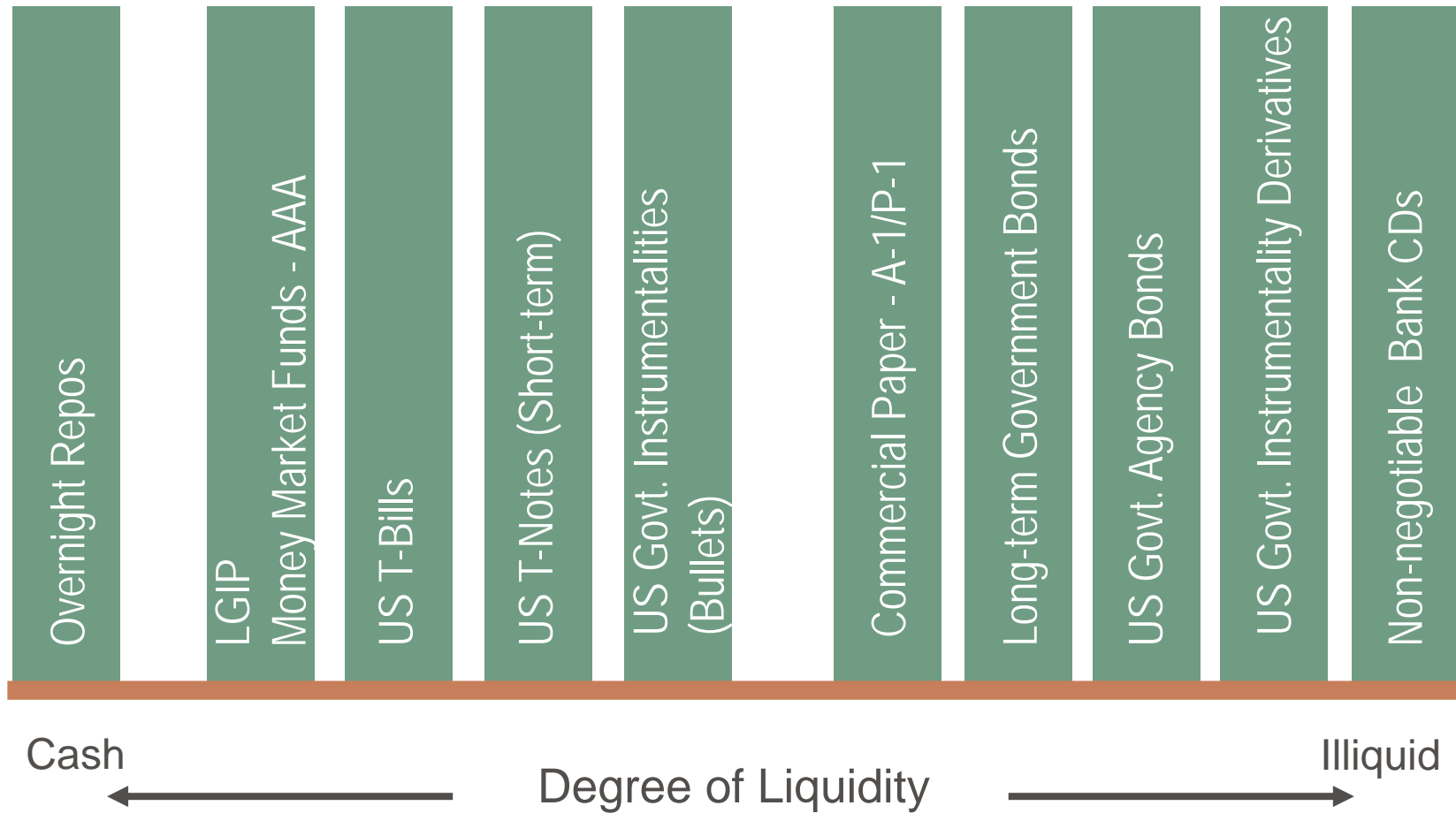


# Market price risk



For illustrative purposes only.

# Liquidity risk



For illustrative purposes only.

## Reading material

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1. Investopedia – “The Advantages of Bonds”
2. Investopedia – “The Basics of Bonds”
3. Investopedia – “Bond Basics: Characteristics”
4. Investopedia – “Agency Bonds: Limited Risk and Higher Returns”
5. Investopedia – “Callable Bonds: Leading a Double Life”
6. Investopedia – “Advanced Bond Concepts: Bond Type Specifics”
7. Investopedia – “How to Invest in Corporate Bonds”
8. Investopedia – “Bond Basics: Yield, Price and Other Confusion”
9. Investopedia – “How Bond Market pricing Works”
10. Investopedia – “Advanced Bond Concepts: Yield and Bond Price”
11. Investopedia – “Advanced Bond Concepts: Term Structure of Interest Rates”



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