## Background of Speakers

## Hans Hurdle

- Education:
- Swarthmore College
- Certifications:
- Certified Public Accountant (CPA)
- Over 15 years of commercial/investment banking experience
- Structured over $\$ 2.5$ billion in interest rate hedges over the past 10 years
- Underwrote/placed and remarketed over $\$ 2.0$ billion of taxable and tax-exempt bonds
- Provided financial advisory services on numerous project financings
- Credit underwrote over $\$ 1$ billion of municipal credit with a focus on municipal revenue authorities and special purpose entities


## Dom D'Ginto

- Education:
- Villanova, B.S. Finance
- Villanova, MBA
- Certifications:
. Chartered Financial Analyst (CFA)
- Joined PNC Bank in 1987 as a Corporate Banking Relationship Manager in the Philadelphia Region
- Originated the marketing effort for PNC's Derivatives Trading Group in Eastern Pennsylvania, New Jersey and Delaware
- Executed a variety of interest rate and equity hedges for corporate and high net worth PNC clients
- President of the CFA Society of Philadelphia


## Table of Contents

Sections

I Current and Historical Interest Rate Environment

II Taxable and Tax-Exempt Interest Rate Swaps, Caps and Collars

III Risks Associated with Interest Rate Hedging
IV Hedging Documentation
V Case Study One: Manufacturing IRB
VI Case Study Two: Advanced Refunding of a Fixed Rate Bond

VII Case Study Three: Conduit or Permanent Taxable Financings
VIII Contact Information

Current and
Historical Interest
Rate Environment

## Flat vs. Steep Yield Curve



## Credit Spreads: BBB vs. AAA General Obligation Curves



1/28/2007 Yield Curve
Spread $=32$ Bps

1/28/2009 Yield Curve
Spread $=357 \mathrm{Bps}$

## Which Instruments Trade at the Short End of the Yield Curve?

## Variable Rate Demand Bonds (VRDBs)

- Long dated credit enhanced municipal securities which trade on a short term basis.
- VRDBs generally trade in a weekly mode: they can be put with 7 days notice. Weekly bonds trade off of the BMA and LIBOR indices. There is also an active daily market.
- Sold to third party investors which include money market funds, corporations and high net worth individuals.
- The Borrower's effective interest rate equals the BMA or LIBOR derived coupon plus the credit enhancement fee plus other expenses. Note BMA and LIBOR are floating indices.

> For tax-exempt VRDBs, the floating rate has historically been the Securities Industry and Financial Markets Association (SIFMA) index plus/minus zero to ten basis points depending on whether the bonds are subject to AMT or not and also depending on the relative strength of the credit enhancement provider. During the recent financial crisis, most municipal credit enhancement providers and some bank LOCs weren't marketable or required a large risk premium for investors.

## Why is the SIFMA Index generally lower than LIBOR?

- Investors are not taxed on the interest income they receive from tax-exempt bonds.
- If the marginal tax rate is $33 \%$ then an investor will be willing to accept:


## (taxable rate) X (1-tax rate) =

$67 \%$ of the taxable rate.

## LIBOR, SIFMA, and 67\% of LIBOR (15-Year History)

LIBOR vs. SIFMA since 12/21/1994


## LIBOR, SIFMA, and 67\% of LIBOR (Since June 2008)



## U.S. Treasury vs. LIBOR Yield Curve



## Historical Environment - 5 Year Swap Rates



15 Year History
2.35\% (5 year Swap Rate as of $1 / 28 / 2009$ )


History Since
11/30/07

## Historical Rate Environment - 10 Year Treasuries

- 10 Year Treasuries have historically been the permanent taxable financing benchmark

cdfa
$=$
10-Year History
2.68\% (10 year Treasury as of $1 / 28 / 2009$ )

History Since 11/30/2007

## Historical Environment - 10 Year Swap Rates


yan wisem

15 Year History
2.90\% (10 year Swap Rate as of $1 / 28 / 2009$ )

History Since 11/30/2007

## Historical Spread Analysis (10-Yr Treasury vs. 10-Yr Swap)



High Spread : 152 Basis Points
Low Spread: 11 Basis Points
Average Spread: 64 Basis Points

## Historical Environment - 15 Year Swap Rates



## Municipal Interest Rate Indices

SIFMA Index (Weekly Variable Interest Rates) vs. Bond Buyer 25 Index (Fixed Interest Rates)
The BB25 is an estimation of the yield that would be offered on 30-year revenue bonds. The 25 issuers used for this index cover a broad range of types of issues (transportation, housing, hospital, water and sewer, pollution control, etc.) and vary in ratings from Moody's"Baal" to "Aaa" and Standard and Poor's "A" to "AAA," for a composite rating of Moody's "A1" or Standard and Poor's "A+."

SIFMA vs. Bond Buyer 25


2-Year History of the Bond Buyer 25 Index (Since 1/5/2007)

Bond Buyer 25 Since 1/5/2007


# Taxable and Tax Exempt Interest Rate Swaps, Caps and Collars 

## What Is Interest Rate Hedging?

The use of interest rate swaps and other tools to manage cash flow volatility (risk) tied to changes in interest rates.

## The Benefits of Hedging

-Hedging allows you to decide when you want to fix rates.
$\square$ Hedging allows you to decide the term (up to 40 years) of the fixed rate.

DHedging allows you to decide how much of the debt has fixed rates.
-Hedging allows you to lock in rates in advance.

## Key Facts

- Swaps are commitments to pay or receive future cash flows.
- Swaps have a value.
- The value can be positive or negative.
- The value at maturity is zero.
- Traditional fixed rate loans or bonds can have only a negative value.
- Values are derived from hypothetical cash flows based on a notional amounts.
- They can be valued like any other series of cash flows.

Hedges are also called derivatives because their value is derived from another "underlying" financial security.

## Basic Floating-to-Fixed Swap



Floating Rate

| A Swap is a separate transaction |
| :---: |
| The bond/loan is unaffected by hedging |

Floating Rate + Spread

## Bondholder / Lender

## Basic Floating-to-Fixed Swap



Swap payments are based on a common index or rate like SIFMA or LIBOR.
The index is also called the basis for the swap

## Basic Floating-to-Fixed Swap (SIFMA Based Example)



Assumptions: 10 Year Swap, No Amortization

## Basic Floating-to-Fixed Swap (67\% of LIBOR Example)



Assumptions: 10 Year Swap, No Amortization

## Interest Rate Cap

## Definition

- An interest rate cap is an agreement between the seller of the cap and a borrower to limit the borrower's floating interest rate exposure to a specified level for a specified period of time. In essence, a cap is an insurance policy purchased by a floating rate borrower to protect against rising interest rates. The borrower pays a one time upfront premium for protection against the floating index (e.g., LIBOR, Prime, SIFMA, etc.) rising above a specified cap rate (or "strike rate") for a predetermined period of time (e.g., 1yr, 2yr, etc.).


## Who can benefit from this product?

- Any client exposed to rising interest rates can reduce or eliminate their exposure through the use of an interest rate cap. For example, a floating rate borrower, concerned that rates may rise or fall over the maturity of its financing, could use a cap to eliminate exposure to rising rates while retaining the benefit of falling rates.


## Key features

- One time, upfront premium.
- Premium depends on the strike rate and maturity of the cap. Shorter maturity caps have lower premiums. Higher strike rate caps have lower premiums
- No principal exchanged, only interest
- Many Floating rate indices are available
- Can be terminated at any time


## Interest Rate Cap

Company ABC enters into financing agreement with Bank and purchases an interest rate cap from a Counterparty

CAP
Cap Premium



## Sample Pricing for Cap

| Notional Amount: | $\$ 5,000,000.00$ |
| :--- | :--- |
| Start Date: | January 29, 2009 |
| End Date: | January 29, 2012 |
| Cap Strike: | $4.00 \%$, Actual/360 |
| Floating Rate Index: | 1 -month LIBOR, Actual/360 |
| Cap Buyer: | ABC Company |
| Cap Seller: | Counterparty |
| Cap Premium: | $\$ 37,000.00$ |

## Interest Rate Floor

## Definition

- An interest rate floor is an agreement between the seller of the floor and a client to limit the client's floating interest rate exposure to a specified level for a specified period of time. In essence, a floor is an insurance policy purchased by a client to protect against falling interest rates. The client pays a one time, up-front premium for protection against the floating index (e.g., LIBOR, Prime, SIFMA, etc.) falling below a specified floor rate (or "strike rate") for a predetermined period of time (e.g., $1 \mathrm{yr}, 2 \mathrm{yr}$, etc.).


## Who can benefit from this product?

- Any client exposed to falling interest rates can reduce or eliminate their exposure through the use of an interest rate floor. For example, a floating rate investor, concerned that rates may rise or fall over the maturity of its investment, could use a floor to eliminate exposure to falling rates while retaining the benefit of rising rates. Floors are particularly useful for hedging mortgage servicing portfolios and for bank asset and liability management.


## Key features

- One time, upfront premium.
- Premium depends on the strike rate and maturity of the floor. Shorter maturity floors have lower premiums. Lower strike rate floors have lower premiums
- No principal exchanged, only interest
- Many Floating rate indices are available
- Can be terminated at any time


## Sample Pricing for Floor

| Notional Amount: | $\$ 5,000,000.00$ |
| :--- | :--- |
| Start Date: | January 29, 2009 |
| End Date: | January 29, 2012 |
| Floor Strike: | $1.00 \%$, Actual/360 |
| Floating Rate Index: | 1 -month LIBOR, Actual/360 |
| Floor Seller: | ABC Company |
| Floor Buyer: | Counterparty |
| Floor Premium: | $\$ 65,000.00$ |

## Interest Rate Collar

## Definition

- An interest rate collar is an agreement between the seller of the collar and a borrower to limit the borrower's floating interest rate exposure to specified levels for a specified period of time. The collar is created by combining the purchase of an interest rate cap with the sale of an interest rate floor. In this way, a collar establishes both an upper and lower bound to a borrower's exposure to floating interest rates. The purchase of the cap protects the borrower against rising interest rates. The sale of the floor reduces the borrower's benefit to falling rates. If the floating rate index is below the strike rate of the cap and above the strike rate of the floor, no payment is made between the parties.


## Who can benefit from this product?

- Any client exposed to rising interest rates can reduce or eliminate their exposure through the use of an interest rate collar. For example, a floating rate borrower, concerned that rates may rise or fall over the maturity of its financing, could use a collar to limit exposure to rising rates while retaining some benefit to falling rates.


## Key features

- One time, upfront premium. Could also be structured as a "no premium" collar
- "No premium" matches the sale of the floor exactly with the purchase of the cap
- Premium depends on the strike rates of the cap and floor
- Floating rate indices available are the same as a "Plain Vanilla" Swap
- Can be terminated at any time


## Interest Rate Collar

Company ABC enters into financing agreement with Bank and structures a zero premium interest rate collar through a Counterparty

## COLLAR

Payment when 1m


## Sample Pricing for a Zero-Cost Collar

| Notional Amount: | $\$ 5,000,000.00$ |
| :--- | :--- |
| Start Date: | January 29, 2009 |
| End Date: | January 29, 2012 |
| Cap Strike: | 4.00\%, Actual/360 |
| Floor Strike: | 0.90\%, Actual/360 |
| Floating Rate Index: | 1 ABC Company |
| Cap Buyer: | Counterparty |
| Cap Seller: | Counterparty |
| Floor Buyer: | ABC Company |
| Floor Seller: |  |
| Cdfa |  |

# Risks Associated <br> With Interest Rate Hedging 

## Hedging \& Market Inefficiencies and Risks

| Risk | Definition |
| :---: | :---: |
| Credit Risk | Change in Borrower's credit changes their cost of borrowing |
| General Tax Risk | Change in tax law affects tax treatment of tax-exempt bonds/hedges |
| Basis Risk | Mismatch between hedge's performance and the yield on Borrower's bonds |
| Transaction Cost Risk | Transaction costs impact hedge savings |
| Execution Risk | Artificial and adverse market action due to inefficient execution |
| Counterparty Risk | Risk that the Borrower's Counterparty is unwilling or unable to honor its swap obligation. This risk can be mitigated by requiring a swap counterparties' rating to be no less than " $A$ ". |
| Termination Risk | Risk the swap agreement could be terminated involuntarily due to events of default or termination events triggered by either counterparty. Depending on how interest rates at the time of the termination compare with the fixed rate on the swap, the issuer could owe a substantial termination payment to the counterparty and vice-versa. |
| Completion Risk | Non-issuance in conjunction with a decline in rates |

## What if the Hedge is Terminated?

$\square$ Swaps offer you a level playing field if you prepay.

Olf the rate at termination is lower than the comparable rate for the remaining term then you will pay a make whole payment to the bank.

Ilf the rate at termination is higher than the comparable rate for the remaining term then you will receive a make whole payment from the bank.

QTraditional fixed rate loans can only have a negative value if you prepay.

Swap math is like bond math: There is a relationship between the direction of the interest rates and the value of a swap.

## Early Termination Example

The table below illustrates the bilateral make-whole associated with the proposed swap assuming a 50 bp change in rate, should it be terminated prior to maturity based on a notional amount of $\$ 4 \mathrm{MM}$ accreting to $\$ 10 \mathrm{MM}$, and a swap rate of $1.98 \%$ representing a $67 \%$ of LIBOR swap rate for a 15 -year term.

|  |  | If Termination Occurs When: |  |  |  |
| :---: | ---: | ---: | ---: | ---: | ---: |
|  |  |  |  |  |  |
| Years Left <br> on Swap | Original Swap Rate | Rates are <br> Higher 100 bp | Rates are Lower <br> $\mathbf{1 0 0}$ bp | Rates are Higher <br> $\mathbf{1 5 0}$ bp | Rates are Lower <br> $\mathbf{1 5 0}$ bp |
| 15 | $1.98 \%$ | $\$ 1,137,259$ | $(\$ 1,329,235)$ | $\$ 1,643,098$ | $(\$ 2,076,330)$ |
| 14 | $1.98 \%$ | $\$ 1,131,149$ | $(\$ 1,302,262)$ | $\$ 1,640,278$ | $(\$ 2,026,297)$ |
| 13 | $1.98 \%$ | $\$ 1,064,857$ | $(\$ 1,215,024)$ | $\$ 1,547,360$ | $(\$ 1,886,023)$ |
| 12 | $1.98 \%$ | $\$ 996,590$ | $(\$ 1,126,931)$ | $\$ 1,451,208$ | $(\$ 1,745,076)$ |
| 11 | $1.98 \%$ | $\$ 926,288$ | $(\$ 1,037,975)$ | $\$ 1,351,710$ | $(\$ 1,603,452)$ |
| 10 | $1.98 \%$ | $\$ 853,892$ | $(\$ 948,147)$ | $\$ 1,248,749$ | $(\$ 1,461,149)$ |
| 9 | $1.98 \%$ | $\$ 779,338$ | $(\$ 857,439)$ | $\$ 1,142,206$ | $(\$ 1,318,162)$ |
| 8 | $1.98 \%$ | $\$ 702,562$ | $(\$ 765,842)$ | $\$ 1,031,955$ | $(\$ 1,174,489)$ |
| 7 | $1.98 \%$ | $\$ 623,498$ | $(\$ 673,347)$ | $\$ 917,867$ | $(\$ 1,030,127)$ |
| 6 | $1.98 \%$ | $\$ 542,078$ | $(\$ 579,946)$ | $\$ 799,808$ | $(\$ 885,071)$ |
| 5 | $1.98 \%$ | $\$ 458,232$ | $(\$ 485,630)$ | $\$ 677,642$ | $(\$ 739,320)$ |
| 4 | $1.98 \%$ | $\$ 371,888$ | $(\$ 390,389)$ | $\$ 551,224$ | $(\$ 592,869)$ |
| 3 | $1.98 \%$ | $\$ 282,970$ | $(\$ 294,215)$ | $\$ 420,406$ | $(\$ 445,714)$ |
| 2 | $1.98 \%$ | $\$ 191,402$ | $(\$ 197,098)$ | $\$ 285,036$ | $(\$ 297,854)$ |
| 1 | $1.98 \%$ | $\$ 97,106$ | $(\$ 99,030)$ | $\$ 144,956$ | $(\$ 149,283)$ |

Rates move higher = PNC pays Borrower Rates move lower $=$ Borrower pays PNC

[^0]Hedging
Documentation

## Hedging Documentation

- Master ISDA
- Schedule and Addendum
- Disclosure Agreement
- Borrower's Resolution
- Underlying Collateral Agreements
- Guarantees
- Trade Confirmation


## ISDA.

2002 MASTER AGREEMENT


```
*)
*)
```



```
marmace
```





```
\).*)
    aumaces
    (a) Emanad cratiom
```




```
    Na/men
```



# Case Study One: Manufacturing IRB 

## What Debt Qualifies for Tax-Exempt Treatment?

-SMALL MANUFACTURERS
-No more than $\$ 20$ million in capital expenditures 3 years back and 3 years forward. $\$ 10$ million in bonds. (as of $1 / 1 / 07$ )
-Only "qualified manufacturing expenditures" can be financed.
-Maximum maturity is $120 \%$ of useful life of project.
-Existing debt associated with capital expenditures can be refinanced with a taxable tail.

## What to do if the Entire Project Financing is not Eligible for Tax-

 Exempt treatment?- Issue a taxable tail which is structured to amortize rapidly to reduce the Borrower's weighted cost of capital.
-Finance any capital expenditures in excess of $\$ 20$ million with operating leases.


## What is a Credit Enhanced Variable Rate Demand Bond?

-Enhanced by bank letter of credit
-Sold to third party investors (direct access to capital markets)
-Bonds can be sold back with 7 days notice.
-Bonds can be prepaid with 45 days notice
-The floating rate equals the interest rate plus the LC fee plus other expenses

> The floating rate is usually the Securities Industry and
> Financial Markets
> Association (SIFMA) index plus zero to ten basis points

## Why Borrowers Like VRDBs

| Feature | Borrower Benefit |
| :--- | :--- |
| Highly Rated Bank <br> Letter of Credit | Maintain bank relationship and <br> obtain low rates |
| Weekly Rate Reset | Manage interest rate risk with <br> swaps |
| Long dated (up to 30 <br> years) | Long Amortizations |
| Prepayment with 45 <br> days notice | Flexibility |

## Bonds are bought primarily by money market funds and corporations.

## Why Investors Like VRDBs

| Feature | Bondholder Benefit |
| :--- | :---: |
| Highly Rated <br> Bank <br> Letter of Credit | Low Credit Risk |
| Weekly Rate <br> Reset | Low rate risk |
| Weekly Put | Good Liquidity \& Short <br> Duration |

## Rate Management Considerations

- The goal of hedging is certainty
- Taking an interest rate position that is either $100 \%$ fixed or floating is a risky position.
- What is the likelihood that floating rates will increase and by how much?
- Liabilities, like assets, should be diversified
- How much certainty is the right amount?


## Case Study \#1 -Tax-Exempt Portion - 15 Year Swap



> Assumptions: \$10MM tax-exempt capital expenditures amortizing with level principal and interest payments over 20 years. The SIFMA swap rate under the same circumstances would be 2.95\%.

## Case Study \#1 -Taxable Portion - 15 Year Swap



Assumptions: \$5MM taxable portion amortizing with level principal and interest payments over 20 years principal and interest payments over 20 years

## Case Study Two:

 Advance Refunding of a Fixed Rate Bond
## Executive Summary

## Borrower's Financing Objectives:

- Generate $\$ 4$ million in new money proceeds without losing current ratings from S\&P and Moody's.
- Align financial covenants to those in the 2006 bond issue.
- Realize a minimum targeted present value savings percentage by advance refunding the outstanding Series 2001A Bonds.


## Capital Markets Solution:

- Capital Markets Group is proposing to underwrite rated long term fixed rate tax-exempt bonds (Series 2007 bonds) to advance refund the outstanding Series 2001A Bonds, and to generate $\$ 4$ million in new money proceeds.


## Executive Summary

## Borrower Financing Challenge:

- The Borrower will most likely not be able to issue the aforementioned Series 2007 until May of 2007. With economists divided on the prospect of rising interest rates over the next two months, the Borrower is at risk of losing all or some of the projected present value savings of the proposed advanced refunding.


## Capital Markets Solution:

- Implement a hedging strategy employing one of the following three tools to protect the current level of savings or interest rate cost: 1) MMD Rate Lock, 2) Forward Start Swaps (Either a percentage of LIBOR or SIFMA based) or 3) Cash Market Forward.


## Risk Mitigation of Hedging Products



## "Credit Spread" Risk and Yield Curve "Shape" Risk



## Credit spread risk is the risk that the

 Borrower's own bonds do not trade in a consistent range versus a benchmark index like the MMD

Yield curve shape risk is the risk that the Borrower's amortizing bond structure is left exposed to non-parallel rate movements.

## Hedging Strategy

The Borrower intends to advance refund the Series 2001A Bonds, but pricing may not occur until May 1, 2007.

Some borrowers elect to employ a hedging strategy to protect their current level of savings or interest cost. Several instruments can be used:

- MMD rate lock
- Forward starting swap, based on either the SIFMA index or a percentage of LIBOR
- Cash market forward

It is our opinion that a forward-starting SIFMA swap is the best choice for a hedge, because the market is more efficient, larger and provides greater access to liquidity.

It is our opinion that the SIFMA index is the most effective hedging tool because it mitigates tax risk and minimizes basis risk.

## Cash-Settled Forward-Starting Swap

- The Borrower enters into a SIFMA swap with a forward start date that corresponds with the projected issuance date of the refunding bonds, with the intention of cash-settling when the advance refunding bonds are issued.
- No exchange of cash flows will occur until the forward start date.
- No upfront fees are required.
- When the swap is settled, the University will either make or receive a settlement payment, depending on market conditions.


## Cash Settlement Procedures

The CMG will compare the forward starting swap rate with the prevailing fixed swap rate at the time of cash settlement.

The difference in the two rates is multiplied by the notional amount of the contract (reflecting any principal amortization) to maturity and then discounted on a net present value basis.


If the prevailing swap rate is higher than the forward starting swap rate, CMG will make a net payment to the Borrower. This payment would reduce the need for additional bond proceeds, effectively lowering the interest costs on the aggregate refunding issue.

## Forward Purchase by CMG

- One additional option that is being offered by CMG is to commit to purchase the Series 2007 advance refunding bonds today, using a predetermined interest rate scale. This option is subject to credit approval.
- This scenario effectively transfers the risk of interest rate increases from the Borrower to CMG.
- CMG would sell the bonds to investors at prevailing rates when documentation is complete.


## Advance Refunding Analysis

Sources Of FundsPar Amount of Bonds
Additional required Equity contribution\$19,070,000.00Total Sources.\$19,113,113.00
Uses Of FundsCosts of Iss424,513.00
Deposit to Debt Service Reserve Fund (DSRF). ..... ,329,432.00
Deposit to Net Cash Escrow Fund. ..... 17,358,655.40Rounding Amount.512.60
Total Uses ..... \$19,113,113.00
PV Analysis Summary (Net to Net)

| Net PV Cashflow Savings @ 5.025\%(AIC). | 594,639.17 |
| :---: | :---: |
| Total Cash contribution.. | $(43,113.00)$ |
| Contingency or Rounding Amount. | 512.60 |
| Net Present Value Benefit. | \$552,038.77 |
| Net PV Benefit / \$16,855,000 Refunded Principal. | 3.275\% |
| Net PV Benefit / \$19,070,000 Refunding Principal. | 2.895\% |

Net PV Benefit / \$19,070,000 Refunding Principa$2.895 \%$
Bond Statistics

| Average Life. | 14.781 Years |
| :---: | :---: |
| Average Coupon. | 4.8099082\% |
| Bond Yield for Arbitrage Purposes. | 4.7967307\% |
| True Interest Cost (TIC).. | 4.8563991\% |
| All Inclusive Cost (AIC).. | 5.0246967\% |

## Advance Refunding Analysis

Debt Service Comparison

| Date | Total P+I | DSR | Net New D/S | Old Net D/S | Savings |
| ---: | ---: | ---: | ---: | ---: | ---: |
| $06 / 30 / 2007$ | - | - | - | - | - |
| $06 / 30 / 2008$ | $1,316,518.25$ | $(63,769.28)$ | $1,252,748.97$ | $1,297,418.75$ | $44,669.78$ |
| $06 / 30 / 2009$ | $1,313,562.00$ | $(63,769.28)$ | $1,249,792.72$ | $1,294,907.50$ | $45,114.78$ |
| $06 / 30 / 2010$ | $1,314,322.00$ | $(63,769.28)$ | $1,250,552.72$ | $1,296,282.50$ | $45,729.78$ |
| $06 / 30 / 2011$ | $1,318,883.25$ | $(63,769.28)$ | $1,255,113.97$ | $1,296,392.50$ | $41,278.53$ |
| $06 / 30 / 2012$ | $1,317,224.50$ | $(63,769.28)$ | $1,253,455.22$ | $1,295,102.50$ | $41,647.28$ |
| $06 / 30 / 2013$ | $1,314,433.25$ | $(63,769.28)$ | $1,250,663.97$ | $1,292,372.50$ | $41,708.53$ |
| $06 / 30 / 2014$ | $1,315,102.00$ | $(63,769.28)$ | $1,251,332.72$ | $1,293,032.50$ | $41,699.78$ |
| $06 / 30 / 2015$ | $1,314,227.00$ | $(63,769.28)$ | $1,250,457.72$ | $1,291,907.50$ | $41,449.78$ |
| $06 / 30 / 2016$ | $1,307,317.00$ | $(63,769.28)$ | $1,243,547.72$ | $1,288,947.50$ | $45,399.78$ |
| $06 / 30 / 2017$ | $1,309,257.00$ | $(63,769.28)$ | $1,245,487.72$ | $1,288,965.00$ | $43,477.28$ |
| $06 / 30 / 2018$ | $1,304,932.00$ | $(63,769.28)$ | $1,241,162.72$ | $1,286,470.00$ | $45,307.28$ |
| $06 / 30 / 2019$ | $1,308,816.00$ | $(63,769.28)$ | $1,245,046.72$ | $1,286,557.50$ | $41,510.78$ |
| $06 / 30 / 2020$ | $1,305,776.00$ | $(63,769.28)$ | $1,242,006.72$ | $1,284,650.00$ | $42,643.28$ |
| $06 / 30 / 2021$ | $1,306,202.00$ | $(63,769.28)$ | $1,242,432.72$ | $1,285,605.00$ | $43,172.28$ |
| $06 / 30 / 2022$ | $1,304,976.00$ | $(63,769.28)$ | $1,241,206.72$ | $1,284,093.75$ | $42,887.03$ |
| $06 / 30 / 2023$ | $1,301,565.00$ | $(63,769.28)$ | $1,237,795.72$ | $1,280,106.25$ | $42,310.53$ |
| $06 / 30 / 2024$ | $1,300,825.00$ | $(63,769.28)$ | $1,237,055.72$ | $1,283,531.25$ | $46,475.53$ |
| $06 / 30 / 2025$ | $1,298,145.00$ | $(63,769.28)$ | $1,234,375.72$ | $1,279,225.00$ | $44,849.28$ |
| $06 / 30 / 2026$ | $1,298,403.75$ | $(63,769.28)$ | $1,234,634.47$ | $1,277,187.50$ | $42,553.03$ |
| $06 / 30 / 2027$ | $1,296,480.00$ | $(63,769.28)$ | $1,232,710.72$ | $1,276,885.00$ | $44,174.28$ |
| $06 / 30 / 2028$ | $1,292,373.75$ | $(63,769.28)$ | $1,228,604.47$ | $1,273,160.00$ | $44,555.53$ |
| $06 / 30 / 2029$ | $1,290,746.75$ | $(63,769.28)$ | $1,226,977.47$ | $1,271,100.00$ | $44,122.53$ |
| $06 / 30 / 2030$ | $1,291,345.50$ | $(63,769.28)$ | $1,227,576.22$ | $1,270,415.00$ | $42,838.78$ |
| $06 / 30 / 2031$ | $2,586,736.25$ | $(1,361,316.64)$ | $1,225,419.61$ | $1,270,815.00$ | $45,395.39$ |
|  |  |  |  |  |  |
| Total | $\$ 32,628,169.25$ | $(2,828,010.08)$ | $\$ 29,800,159.17$ | $\$ 30,845,130.00$ | $\$ 1,044,970.83$ |

PNC

# Case Study Three: Conduit or Permanent Taxable Financings 

## Company's Capital Structure

Company's Capital Structure<br>Description of Proposed<br>Long Term Debt Financings

Permanent Market Facilities: \$13,000,000
Prospectively priced at 10 Year Treasuries plus 200 b.p.
Structured to finance the Stabilized Project Stage for 120 months.
Amortizing over 20 years on a level debt service basis.

## Hedging Alternatives

- The product most often used to hedge future fixed rate financings is a cash settled 30 Day LIBOR based interest rate swap.
- The swap allows a Borrower to "lock in" a fixed interest rate on a floating rate facility both on a current and forward basis. This hedging vehicle is not a perfect hedge in that both the LIBOR swap/Treasury spread and Permanent Market Credit Spreads are subject to change. Mitigating the LIBOR swapTreasury spread risk is today's spread.
- Based on our analysis, the Company should swap 75-100\% of its Permanent Project Financings


## Mechanics of Hedge Settlement and Debt Pricing

In 24 mos., permanent debt priced and hedge cash settled.

- Cash settlement of hedge due upon projected permanent financing dates (e.g., potentially prior to or after loan funding)
- The economics of cash settlement are identical to shorting a series of $10-y r$ Treasury Notes today and buying back the notes at settlement when the debt is priced.
- If rates are above the locked rate (lower prices), you will receive a payment. If rates are below the locked rate (higher prices), you will be required to make a payment.
- The payment made or received will be equal to the PV of the basis point differential between the locked rate and the actual Swap rate at the settlement.
- The payment made or received will be offset by the higher or lower fixed rate on the underlying financing


## Additional Considerations

You would amortize the gain or loss on each cash settlement over the life of the financing, therefore creating a fixed rate debt service equal to the locked rate plus the credit spread.

- Depending on market conditions, if you fund the loan and settle the hedge early, you would receive back a portion of the Forward Premium
- If the debt issuance is delayed and the hedge needs to be kept in place, there are different scenarios based on the product selected. See the advantages and disadvantages page for further description.


## Comparison of Hedge Alternatives: Swap Advantages

## Swap Advantages

- Efficient pricing for short or long terms
- Provides known effective Treasury Rate on future fixed rate financing. To the degree that your loan spread and swap spreads move in the same direction, swaps will provide a partial hedge to your loan spread. Note, with credit spreads at near historical lows, this hedging strategy will not mitigate the risk of rising spreads.
- If the loan closing is delayed, the swap can simply begin and remain in place until the loan closes. Any interest due from you under the swap would be a part of the termination value upon closing. The interest owed would reflect the additional cost of carry to keep the swap in place.


## Comparison of Hedge Alternatives: Swap Disadvantages

Loan Spread / Swap Spread Correlation Risk/Reward

- If swap spreads decline and your loan spreads remain constant, the swap strategy would create a cost to you; however, swap spreads are at or near historic lows as illustrated on slide 14.
- If swap spreads increase and your loan spreads remain constant, the swap strategy would create value for the Company.


## Recommended Strategy

Swaps are the preferred strategy to hedge the risk of Treasury rate movements due to their liquidity.

- Provides flexibility that would allow you to keep the hedge in place against floating rate debt if the fixed rate debt did not close
- Direction of spread movements are generally the same although not always one for one. Given the current level of swap spreads, the magnitude of the risk that swap spreads rise and cause borrowing spreads to rise is greater than the potential risk that swap spreads fall and borrowing spreads do not decline.
- Given the current level of swap spreads - near all time lows - the risk associated with spot swap spreads falling much further is diminished.


## Contact Information

## Contact Information

Hans Hurdle
Hans-Michael.Hurdle@pnc.com
410-237-5315
2 Hopkins Plaza, Baltimore MD 21201

Dom D'Ginto
Domenic.DGinto@pnc.com
215-585-1201
1600 Market Street, Philadelphia PA 19103


[^0]:    Assumptions:
    The Mark to Market values are a one-time buyout cost/revenue for unwinding the plain vanilla swap. These "buy-out" costs are estimates only and assume a parallel shift in the yield curve. Market conditions and the shape of yield curve may result in differences between actual costs and these estimates.

