89th Annual West Texas County Judges and Commissioners Association Conference

Wednesday, April 25, 2018
10:15 – 11:05 a.m.

“4.010 Financial Accounting: Investments”

Ms. Linda Patterson
President
Patterson & Associates
Why the Court Gets Investment Reports

- Court is *statutorily* the ultimate fiduciary on portfolio
- Court sets parameters in its investment policy each year
- Are the investments following the policy guidelines?
- These are citizen’s funds and your assets
- Investments *always represent risk*
  - You must look for the risks

What the Court Needs To Know

- A *macro view* of the portfolio
  - The 'big' picture
  - The summary not every detail

- Does the portfolio represent and give the County:
  - safety
  - liquidity
  - diversification
  - yield
PFIA Gives Guidelines and Flexibility

- Your policy chooses from a menu of available investments

- Your investments are very restricted
  - No stocks – don’t compare to stocks
  - Little risk – so restricted yields
  - Highest credit quality

- Basically:
  - US Government investments
  - Money markets (pools and money market funds)

Key Concepts in Investment Safety

- The key concepts focus on safety and are shown in reports

- Maximum maturity

- Maximum weighted average maturity

- Diversification/Allocation

- Not sheltering but nourishing

Key Security Accounting Concepts to Know

- Weighting information

- How the security is bought
  - Par
  - Premium
  - Discount

- How it changes value over time
  - Accretion
  - Amortization
  - Gain/losses

- How securities earn

- Benchmarks
Two Types of Securities

- **Money market** = created with maturities 1 year or less
  - Here you earn solely from accretion of principal
    - US Government > T-Bills
    - US Agencies > Discount Notes
    - Local Government > BANs, TRANs
    - Corporations > Commercial Paper

- **Fixed income** = created with maturities 1 year or more
  - Here you can earn from principal and interest
    - US Government > Treasury Notes/Bond
    - US Agencies > Agency Notes
    - Local Government > Long-term Bonds
    - Corporations > Corporate Notes

What I Need to Know about Investment Accounting

- The **book value** of my portfolio
  - What is my investment worth throughout its life

- The **market value** of my portfolio
  - What could I sell it for if I need to
  - Less important since you are buy-and-hold portfolios

- How these values are changing
  - Illustrates volatility
  - Volatility = risk
  - How that affects my strategy

BOOK Values Move Only Straight to Par

- **Bought above par** moves to par
  - Amount above par is amortized – “expensed”

- **Bought below par** moves to par
  - Amount below par is accreted – “earns”
Market Values: Prices and Yields Move Inversely

A 5% coupon at par (100)
Coupon = 5% Yield = 5%

If Rates Go UP

A 5% coupon is not worth as much if rates go up so price goes down
Coupon = 5% Yield = 6%

If Rates Go DOWN

A 5% coupon is worth more if rates go down so price goes up
Coupon = 5% Yield = 4%
How Do We Earn?

- Earnings come everyday just like your pay basis – not tied to cash
- Earnings come from only two sources:
  - Principal
    - The value of the principal increases
  - Interest
    - A note’s coupon accrues then pays on a set schedule
    - Interest accrues then pays on a fund/pool – usually monthly
    - A CD usually accrues then pays at maturity

Accounting Three-Step

- Entry made when security is bought
  - Capturing detail and position value
- Entries made monthly
  - Capturing interest accruals
  - Capturing cash flows from coupons
  - Capturing changes in the principal owned (book value)
- Entry made at maturity
  - Capturing last interest payment
  - Capturing the repayment of your principal

How Do We Earn? Every Day!

- On interest
  - A CD is bought at Par and stays at Par (100¢ = $1)
  - It’s principal never changes
  - It must earn on the coupon (interest)
- On Principal
  - A T-Bill has no coupon so it has to earn on principal only
  - You buy it at a discount and the book value moves to Par
  - You buy it at $0.90/$1 and it matures at $1/$1
Discount Structured Securities

- Always bought at a price less than 100
- Always accretes on a straight line
- Earn daily and only through accretion
- Buying a $100,000 T-Bill
  - Price = $ 98,000
  - You own it 200 days until maturity
  - Discount / # of days = $ 10 / day

A note will have coupon accrual during its life in addition to possible accretion and amortization.

Accrued Interest:
Earnings from Banks, Pools and Funds

- Both of these earn for you from interest only
- You report the beginning principal as beginning book value
- Add the earnings from the month as interest
- You report the ending balance with the principal plus interest

- Money market mutual funds (MMMF)
  - MMMFs under Act must Strive for $1 NAV
  - They accrue daily and pay monthly

- Bank accounts (including money market accounts)
  - All accounts accrue on balances daily and pay monthly
Portfolio Earnings Move Every Day/Month

- Accrued interest
  - Pools and banks accrue on your accounts
  - Accrue daily and pay monthly

- Plus Accretion
  - Any security bought below par (at a discount) is accreting daily

- Minus Amortization
  - Any security bought above par (at a premium) is amortizing daily

Interest Distribution

- Effectively distributing earnings to various funds
- Replaces separate portfolios
- May add to your overall yield by better utilization
- Distributed on a pro rata basis by percent of fund
  - Just like a pool or fund distributes to you

- Accuracy
- Ease
- Timeliness

Distributing Interest

<table>
<thead>
<tr>
<th>Balance</th>
<th>Percent of Balance</th>
<th>Total Earnings $10,000</th>
<th>Distribution of Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>150,000</td>
<td>8.14%</td>
<td>813.67</td>
<td></td>
</tr>
<tr>
<td>40,000</td>
<td>2.17%</td>
<td>216.98</td>
<td></td>
</tr>
<tr>
<td>101,500</td>
<td>5.51%</td>
<td>550.58</td>
<td></td>
</tr>
<tr>
<td>250,000</td>
<td>13.56%</td>
<td>1,356.12</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>0.54%</td>
<td>488.20</td>
<td></td>
</tr>
<tr>
<td>112,000</td>
<td>6.08%</td>
<td>607.54</td>
<td></td>
</tr>
<tr>
<td>75,000</td>
<td>4.07%</td>
<td>406.83</td>
<td></td>
</tr>
<tr>
<td>125,000</td>
<td>6.78%</td>
<td>678.06</td>
<td></td>
</tr>
<tr>
<td>90,000</td>
<td>4.82%</td>
<td>4,882.02</td>
<td></td>
</tr>
<tr>
<td>1,843,500</td>
<td>100%</td>
<td>10,000.00</td>
<td></td>
</tr>
</tbody>
</table>
Yield
- Yield allows us to compare any security to another
  - This is the common denominator
- Your yield remains the same for you as long as you own it
  - Your ‘holding’ yield
- Yield is a calculation based on price and coupon
  - Coupons on debt securities will not change (they are “fixed”)
  - Market price will change daily
  - If your book value is > market value you have a ______?

Unrealized and Realized
- A gain or loss is not ‘realized’ until it is taken
- This is the difference between market and book value
- Differences between book and market show volatility
- What is the risk of taking out a big gain? big loss?

Pricing
- Require an independent source
  - Brokers, banks, IDC, Sungard, Thomson-Reuters
- PRICE X FACE = MARKET VALUE
- Gains and Losses
  - realized and unrealized
- Structured securities can be tricky
  - Calls, step-ups, floaters, indexed, TIPS, pools
- Mortgage-backed securities need more
  - particularly subjective/judgmental pricing
  - Prepayment speed assumptions, PSA rates
A Cardinal Reporting Rule: Weighting

- Weighting the information
  - All weighting is done on book value
  - Shows level of risk
- Illustrates strategy
  - Extending or shortening
- Recognizes the impact of
  - Dollar value
  - Maturity
  - Yield

<table>
<thead>
<tr>
<th>Book Value</th>
<th>Days to Maturity</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000,000</td>
<td>250</td>
<td>250,000,000</td>
</tr>
<tr>
<td>500,000</td>
<td>100</td>
<td>50,000,000</td>
</tr>
<tr>
<td>500,000</td>
<td>360</td>
<td>180,000,000</td>
</tr>
<tr>
<td>250,000</td>
<td>300</td>
<td>75,000,000</td>
</tr>
<tr>
<td>1,000,000</td>
<td>200</td>
<td>200,000,000</td>
</tr>
<tr>
<td>1,500,000</td>
<td>100</td>
<td>150,000,000</td>
</tr>
<tr>
<td>1,500,000</td>
<td>30</td>
<td>45,000,000</td>
</tr>
<tr>
<td>750,000</td>
<td>30</td>
<td>22,500,000</td>
</tr>
<tr>
<td>1,000,000</td>
<td>90</td>
<td>90,000,000</td>
</tr>
<tr>
<td>8,000,000</td>
<td></td>
<td>132.8 days</td>
</tr>
</tbody>
</table>

Weighted Average Yield

- The weighted average yield will accurately describe the performance of a buy-and-hold portfolio.
- Weighted yield is a measure against your benchmark.
- This measure does not consider market value impact.
- This measure reflects the price at which you bought the securities.

Calculating Weighted Average Yield

Weighted yield allows comparison to benchmark

<table>
<thead>
<tr>
<th>Book Value</th>
<th>Yield</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000,000</td>
<td>0.70</td>
<td>700,000</td>
</tr>
<tr>
<td>500,000</td>
<td>0.30</td>
<td>150,000</td>
</tr>
<tr>
<td>500,000</td>
<td>0.10</td>
<td>50,000</td>
</tr>
<tr>
<td>250,000</td>
<td>0.60</td>
<td>150,000</td>
</tr>
<tr>
<td>1,000,000</td>
<td>0.15</td>
<td>550,000</td>
</tr>
<tr>
<td>1,500,000</td>
<td>0.90</td>
<td>1,350,000</td>
</tr>
<tr>
<td>1,500,000</td>
<td>0.01</td>
<td>15,000</td>
</tr>
<tr>
<td>750,000</td>
<td>0.65</td>
<td>482,500</td>
</tr>
<tr>
<td>1,000,000</td>
<td>0.99</td>
<td>990,000</td>
</tr>
<tr>
<td>8,000,000</td>
<td>0.55%</td>
<td>4,442,500</td>
</tr>
</tbody>
</table>
Your Strategy Protects You – Look for It

- Buy and Hold
- Diversification by issuer or market sector
- Laddering out to meet liabilities
- Combining fund for investment

Reporting the Results

- The solid accounting should result in informative reports
- Show the detailed accounting but focus on information
- Detail information
  - Archival, full details on each position
  - Bank positions and compensating balances
- Summary information
  - Book and market values to measure value and volatility
  - Risk parameters: weighted maturities and weighted yield

What Should the Court Look For On Reports?

- Diversification
  - By market sector and maturity
  - Shows strategy and planning – using the markets
  - Laddered maturities fulfill upcoming liabilities
- Maximum weighted average maturity
  - Shows how long before funds are liquid
- Benchmark comparison
### Holding Report Sorted by Sector

<table>
<thead>
<tr>
<th>Security Type</th>
<th>Purchase Date</th>
<th>Coupon Rate</th>
<th>Maturity Date</th>
<th>Yield Begin.</th>
<th>Book Ending</th>
<th>Book Beginning</th>
<th>Market Ending</th>
<th>Market Beginning</th>
<th>Earnings</th>
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</thead>
<tbody>
<tr>
<td>Treasuries</td>
<td>xx/xx/xx</td>
<td>T</td>
<td>xx/xx/xx</td>
<td>0.00%</td>
<td>95,000</td>
<td>95,000</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agencies</td>
<td>xx/xx/xx</td>
<td>FNMA</td>
<td>xx/xx/xx</td>
<td>0.95%</td>
<td>999,910</td>
<td>999,910</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDs</td>
<td>xx/xx/xx</td>
<td>Pecos</td>
<td>xx/xx/xx</td>
<td>1.10%</td>
<td>248,000</td>
<td>248,000</td>
<td>248,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pools</td>
<td>xx/xx/xx</td>
<td>Texpool</td>
<td>xx/xx/xx</td>
<td>0.50%</td>
<td>1,450,200</td>
<td>1,450,200</td>
<td>1,450,200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank</td>
<td>xx/xx/xx</td>
<td>Int.</td>
<td>xx/xx/xx</td>
<td>0.01%</td>
<td>2,333,100</td>
<td>2,333,101</td>
<td>2,333,101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMA</td>
<td>xx/xx/xx</td>
<td></td>
<td>xx/xx/xx</td>
<td>0.50%</td>
<td>2,500,000</td>
<td>3,500,700</td>
<td>2,500,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Summary</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8,531,810</td>
<td>7,533,501</td>
<td>8,533,049</td>
<td>8,533,050</td>
<td>1,461</td>
</tr>
</tbody>
</table>

### Diversification by Sector

- Shows diversification
- Illustrates Risks
  - Too short
  - Too long
  - Barbelled

### Diversification by Maturity

- Maturity breakdown shows strategy and reflects cash flow
  - Shape shows how various time horizon periods are being funded
- Shows coverage of liabilities
- Funds concentration on near-by liabilities
  - Plus use of longer opportunities
Benchmarks

- Purpose
  - Risk and performance
  - For public entities basically risk

- Select yield versus rate of return
  - Comparability
  - Sector recognition
  - Comparable Treasury Bill versus your yield
    - Always compare same periods
    - Match your benchmark choice to your policy WAM limit

Report Shows Detail, Activity and Compliance

Linking the detail report to a summary presents all the information.
See Any Problems Here?

- Begin Book: 20,000,000
- Begin Market: 18,000,000
- Yield: 2.0%
- WAM: 200 days
- End Book: 17,000,000
- End Market: 14,000,000
- Yield: 2.6%
- WAM: 230 days
- Benchmark: 1.8%

See Any Problems Here? What do you see?

- Begin Book: 20,000,000
- Begin Market: 18,000,000
- Yield: 1.85%
- WAM: 157 days
- End Book: 19,000,000
- End Market: 18,000,000
- Yield: 1.80%
- WAM: 145 days
- Benchmark: 1.82%

Income Accounting Terms For Your Later Use

- Interest Earned = par x interest rate x time (I=PRT)
- Time (day count method) varies by type of security
- Accrued Interest = interest earned since last interest payment
- CDs may be either 360 or 365 days for calculation

0/360 basis (Agency, Instrumentality, Municipal Notes)
- Par x interest rate x # days held in period
- *each month is 30 days regardless

Actual/Actual (T-Note)
- Par x interest rate/payments per year x # days held in period
- # days in current coupon period
Questions?

Thank you and good investing!