Passive versus Active Portfolio Strategies: What is right for you?

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Luke@gpafixedincome.com
503-248-9973
<table>
<thead>
<tr>
<th><strong>Buy and Hold</strong></th>
<th><strong>Sell and Swap</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you buy and hold?</td>
<td>• Will you sell?</td>
</tr>
<tr>
<td></td>
<td>• If you sell will you take a loss?</td>
</tr>
<tr>
<td></td>
<td>• If you sell do you buy another issue? Always or sometimes?</td>
</tr>
</tbody>
</table>
Rate Structure

<table>
<thead>
<tr>
<th>Pool</th>
<th>1 Year Maturity</th>
<th>2 Year Maturity</th>
<th>5 Year Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00%</td>
<td>1.00%</td>
<td>2.00%</td>
<td>3.00%</td>
</tr>
<tr>
<td>4.00%</td>
<td>2.00%</td>
<td>3.00%</td>
<td>4.00%</td>
</tr>
<tr>
<td>6.00%</td>
<td>3.00%</td>
<td>4.00%</td>
<td>5.00%</td>
</tr>
</tbody>
</table>

What maturity would you have bought in each year with new money?

- 2007?
- 2008?
- 2014?

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool</td>
<td>5.30%</td>
<td>2.50%</td>
<td>0.09%</td>
</tr>
<tr>
<td>1 Year Maturity</td>
<td>5.24%</td>
<td>2.75%</td>
<td>0.01%</td>
</tr>
<tr>
<td>2 Year Maturity</td>
<td>5.00%</td>
<td>3.00%</td>
<td>0.53%</td>
</tr>
<tr>
<td>5 Year Maturity</td>
<td>5.00%</td>
<td>3.50%</td>
<td>1.85%</td>
</tr>
</tbody>
</table>

Source: Bloomberg
<table>
<thead>
<tr>
<th>Asset Class and Structure</th>
<th>What Asset Type would you buy?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period 1:</strong> 2 Year Note Maturity</td>
<td>• Period 1?</td>
</tr>
<tr>
<td>UST Treasury  1.00%</td>
<td></td>
</tr>
<tr>
<td>FHLB Non- Call 1.20%</td>
<td>• Period 2?</td>
</tr>
<tr>
<td>FHLB Callable 6 month 1.50%</td>
<td></td>
</tr>
<tr>
<td><strong>Period 2:</strong> 2 Year Note Maturity</td>
<td></td>
</tr>
<tr>
<td>UST Treasury  1.00%</td>
<td></td>
</tr>
<tr>
<td>FHLB Non- Call 1.00%</td>
<td></td>
</tr>
<tr>
<td>FHLB Callable 6 month 1.05%</td>
<td></td>
</tr>
<tr>
<td>Rates are expected to go down?</td>
<td>Rates are expected to go up?</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td><strong>1.</strong> Do you buy when you have cash available?</td>
<td><strong>•</strong> Do you buy when you have cash available to invest now?</td>
</tr>
<tr>
<td><strong>2.</strong> Do you try to buy early by reducing liquidity?</td>
<td><strong>•</strong> Do you wait to buy until rates move up?</td>
</tr>
</tbody>
</table>
Perception of Passive

- Buy and Hold
- Don’t consider market conditions
- Do the same all the time
- Can’t predict interest rates

Perception of Active

- Active trading – buying and selling
- Predicting interest rates
- Takes a lot of time
- Higher transaction costs
- Not sure if you can make a difference

How do you manage your funds?
How do you manage your funds?

Reality of Passive

- Buy and Hold - limits the portfolio
- Public fund investors are forced to consider market changes given timing of cash flows and overall fund balances
- Public fund investors do have an outlook on interest rates
- Need to have a market benchmark to define and compare passive strategy.

Reality of Active

- Public fund investors can be active without having high turnover in the portfolio.
- Timing purchases can add value to the portfolio earnings
- Public fund investors are forced to incorporate some active strategies when making investments.
- Need to have a market benchmark to compare to passive
INVESTMENT MANAGEMENT DEFINITION: Passive versus Active

In its simplest, it’s an investment strategy that removes human hunches from the process of deciding what to own and when to own it.

In an “active” strategy, investors make investment decisions based on his or her research, intuition and experience.

In a “passive” fund, there’s a rulebook that defines an index, and that index determines what’s in the fund.
## FACTS:

<table>
<thead>
<tr>
<th>Passive Management</th>
<th>Key Feature</th>
<th>Active Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally lower than active management</td>
<td>Investment Management Fees</td>
<td>Generally higher than passive management</td>
</tr>
<tr>
<td>Generally tax efficient</td>
<td>Tax Efficiency</td>
<td>Depends on the investment manager</td>
</tr>
<tr>
<td>No</td>
<td>Potential for Above-Market Returns</td>
<td>Yes</td>
</tr>
<tr>
<td>Yes, after incorporating fees</td>
<td>Potential for Below-Market Returns</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>Potential for Down Market Protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Seeks to replicate the performance of the benchmark</td>
<td>Decision Making Process</td>
<td>Seeks to capitalize on market conditions</td>
</tr>
</tbody>
</table>
Does active management, as defined, work?
The first step to any investment strategy is determining the appropriate **market** benchmark.

- Do you manage to an index?
- Do you consider an index valuable?
- Does an index work if you are buy and hold?
- How do you know what index is best for you?

- **WHAT IS AN INDEX?**
<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Duration</th>
<th>Last Quarter</th>
<th>Last Year</th>
<th>3 Year</th>
<th>5 Year</th>
<th>10 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTreasury 0-1 Year</td>
<td>0.526</td>
<td>0.033%</td>
<td>0.162%</td>
<td>0.182%</td>
<td>0.272%</td>
<td>1.851%</td>
</tr>
<tr>
<td>USTreasury 0-3 Year</td>
<td>1.477</td>
<td>0.196%</td>
<td>0.574%</td>
<td>0.486%</td>
<td>0.914%</td>
<td>2.364%</td>
</tr>
<tr>
<td>USTreasury 0-5 Year</td>
<td>2.256</td>
<td>0.438%</td>
<td>0.946%</td>
<td>0.908%</td>
<td>1.580%</td>
<td>2.876%</td>
</tr>
</tbody>
</table>

**Annualized Returns (%) 6/30/2014**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Duration</th>
<th>Last Quarter</th>
<th>Last Year</th>
<th>3 Year</th>
<th>5 Year</th>
<th>10 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTreasury 0-1 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USTreasury 0-3 Year</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USTreasury 0-5 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Historical Returns for Invested Core Portfolio 6/30/2014**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Duration</th>
<th>Last Quarter</th>
<th>Last Year</th>
<th>3 Year</th>
<th>5 Year</th>
<th>10 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTreasury 0-1 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>USTreasury 0-3 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USTreasury 0-5 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Benchmark Annual Returns %**

- US Treasury 0-1 Year
- US Treasury 0-3 Year
- US Treasury 0-5 Year

Source: Bloomberg
## Percentage Principal Price Change Given Change in Rates

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Duration</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTreasury 0-1 Year</td>
<td>0.526</td>
<td>0.26%</td>
<td>0.53%</td>
<td>0.79%</td>
<td>1.05%</td>
</tr>
<tr>
<td>USTreasury 0-3 Year</td>
<td>1.477</td>
<td>0.74%</td>
<td>1.48%</td>
<td>2.22%</td>
<td>2.95%</td>
</tr>
<tr>
<td>USTreasury 0-5 Year</td>
<td>2.256</td>
<td>1.13%</td>
<td>2.26%</td>
<td>3.38%</td>
<td>4.51%</td>
</tr>
</tbody>
</table>

### Percentage Principal Price Change Given Change in Rates

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Max Duration</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTreasury 0-1 Year</td>
<td>0.53</td>
<td>$263,000</td>
<td>$526,000</td>
<td>$789,000</td>
<td>$1,052,000</td>
</tr>
<tr>
<td>USTreasury 0-3 Year</td>
<td>1.48</td>
<td>$738,500</td>
<td>$1,477,000</td>
<td>$2,215,500</td>
<td>$2,954,000</td>
</tr>
<tr>
<td>USTreasury 0-5 Year</td>
<td>2.26</td>
<td>$1,128,000</td>
<td>$2,256,000</td>
<td>$3,384,000</td>
<td>$4,512,000</td>
</tr>
</tbody>
</table>

Source: Bloomberg and GPAfixedincome.com

### What is your risk?

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**Risk**

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Importance of a Strategy

- Manage risk in portfolio
- Manage return expectations
- Structure risk profile of portfolio
- Provides discipline in portfolio management
- Establish accountability
- Promotes communication
What to consider?

• What are the goals of the investment program?

• What are investment constraints?

• What are risk tolerances?

• How can investments be structured to meet those goals?

• What experience does staff have?
Facts

- Interest rates change.
- Your entities cash flow requirements change.
- Your investments and earnings are affected by changing rates.
- Forethought into the investment strategy is important as it can make a big difference in your earnings outcome.
- The impact is all relative and works on any size portfolio.
## Benefits of a strategy

<table>
<thead>
<tr>
<th>Decision Making Strategy Tools</th>
<th>Improved Process</th>
<th>Improved Communication</th>
<th>Self-Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration -87% of returns</td>
<td>Efficient</td>
<td>Same Vocabulary</td>
<td>Understand outcome of decisions</td>
</tr>
<tr>
<td>Asset Allocation</td>
<td>Pre-determined strategy</td>
<td>Board, Committee and Staff</td>
<td>Tracking of decisions</td>
</tr>
<tr>
<td>Yield Curve Positioning</td>
<td>Accountable</td>
<td>Consistent over interest rate cycles</td>
<td>Value added can be measured</td>
</tr>
</tbody>
</table>
Portfolio Management = Risk Management

• The greater an investor’s exposure to properly *diversified* risk, the higher the expected return over time.

• The greater an investor’s exposure to risk, the higher will be the volatility of return from period to period.

• The objective of “safety” requires establishing risk constraints.
Source of Return

- Coupon Income
- Reinvestment income
- Capital gain or loss
Factors that Affect Market Values

1. Changes in the levels of rates
2. Changes in the shape of the curve
3. Changes in yield spreads between sectors
4. Changes in the yield spread for a particular bond
Passive & Active Management (Assumptions)

• Passive
  • Low to no market analysis
  • Minimum resources

• Active
  • Greater market analysis required
  • Greater resources and expertise
• Most public funds investors constrain themselves to buy and hold
• Most public entities have variable cash flows
• Most public entity investors consider rates when making investments
• Most public entities only look at book yield
• Most public entities do not have market benchmarks

Does this make public funds ACTIVE OR PASSIVE?
Portfolio Strategies

Passive Portfolio Management
Passive Management – Public Fund Viewpoint

- Strategies
  - Liquidity pool
  - Cover next disbursement
  - Asset/liability matching
  - Maturity ladder

- Objective
  - Buy and Hold
  - Routine discipline to meet cash flow needs
Passive Portfolio
Laddered or Constant Maturity Format

- Portfolio Holdings are ‘laddered’ in a Constant Maturity
- Maturities are matched to cash flow needs
- Excess funds are invested in the last (4 to 5 yr) bucket
- Buy and Hold investment technique
Passive Portfolio Management

What are you doing?

• Trying to achieve objectives through proper portfolio diversification and policy compliance
• Maintaining desired portfolio structure (duration or ladder shape) over time
• Monitoring credit risk
• Striving to achieve a return that equals the market yield above pool rates consistently over time
Passive Portfolio Management

What you are not doing

- Taking a market “view”
- Predicting interest rates
- Predicting future changes in relative credit quality
- Making “side bets” on market moves
- Swapping as relative values change
- Trying to beat the market

But many treasurers have more money than needed for cash flows
Portfolio Strategies

Active Portfolio Management
Active Portfolio Management

- Creating and maintaining a portfolio structure with acceptable exposure to risk

- Striving to achieve a return and protect market value using one or more of the following strategies:
  - Duration management
  - Yield curve placement
  - Sector weighting decisions
  - Individual security selection
  - Timing
Duration Management: The relationship of price value change given interest rate changes

Example of how the price of a bond reacts to a decline in yields (A to B). While duration would indicate a price of B, the market price would be C, due to the convexity of the bond.
An illustration of how duration affects returns is as follows:

**Assumptions:**
- $100,000 5% Treasury Bond (at par)
- 5 Year Maturity
- 4 Year Duration
- Change in rates over 1 year period

**Scenario #1:** Rates remain Unchanged
- Interest Earned $5000
- Price Change $0
- Total Return $5000 5%

**Scenario #2:** Rates rise 1%
- Interest Earned $5000
- Price Change $(4000)
- Total Return $1000 1%

**Scenario #3:** Rates fall 1%
- Interest Earned $5000
- Price Change $4000
- Total Return $9000 9%
Duration Management: The goal of utilizing duration when making investment decisions, is to achieve higher earnings yield through interest rate cycles based on risk profile.

- Over time book yield and total return equal each other.
- Tracking duration provides guidance to making maturity decisions
- Embracing price change will provide for transparency in your organization

Considerations:

- If you invest too long and rates go up, you will be stuck earning lower rates for longer periods of time, if you can’t sell.
- If you stay to short and rates remain low, you will earn lower rates over time
Yield Curve Strategies
Three Yield Curve Strategies

• Bullet- maturity of the bonds in the portfolio are highly concentrated at one point on the curve – Strategy when curve is expected to steepen

• Barbell – securities are concentrated at 2 extreme maturities – Strategy when curve is expected to flatten

• Ladder – equal amounts at each maturity. For example, equal amounts maturing each month or quarter – Neutral
Portfolio Structure - Bullet

$21 mm Portfolio / $42 mm Budget
Portfolio Structure – Bar Bell

Portfolio Structure - Bar Bell
$21 mm Portfolio / $42 mm Budget
Portfolio Structure - Laddered

$21\text{mm Portfolio} / $42 \text{mm Budget}
Yield Spread Strategies

- Treasury
- Agency Bullet
- Agency Callable
# BASE CASE

<table>
<thead>
<tr>
<th>Issue</th>
<th>Duration</th>
<th>Price</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Year Treasury</td>
<td>UST 1 6/30/18</td>
<td>4.8</td>
<td>100</td>
</tr>
<tr>
<td>5 Year Bullet</td>
<td>UST 1 6/30/18</td>
<td>4.8</td>
<td>100</td>
</tr>
</tbody>
</table>

1 Year from now Spread Widens to normal of +20 (3 Yr)

<table>
<thead>
<tr>
<th>Issue</th>
<th>Duration</th>
<th>Price</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Year Treasury</td>
<td>UST 1 6/30/18</td>
<td>3.8</td>
<td>100</td>
</tr>
<tr>
<td>5 Year Bullet</td>
<td>UST 1 6/30/18</td>
<td>3.8</td>
<td>99.76</td>
</tr>
</tbody>
</table>

## VALUE

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000,000</td>
<td>99.76</td>
<td>$2,400.00</td>
</tr>
<tr>
<td>$10,000,000</td>
<td>99.76</td>
<td>$24,000.00</td>
</tr>
</tbody>
</table>
Active Management Portfolio Strategy

• Interest rate analysis
  • Rate trend
  • Shape of yield curve
  • Direction of yield curve (e.g. steepening; flattening)

• Selecting securities
  • Identify securities with good value
  • Examine characteristics of bond
    • Coupon, maturity, credit quality, options
  • Construct a portfolio that maximizes return/yield given a level of risk
Interest Rate Expectations Strategy

• Alter portfolio’s sensitivity to rates based on interest rate forecast

• Increase duration if rates are expected to fall. Decrease duration if rates are expected to rise (relative to the benchmark)

• Degree to which the duration is permitted to diverge from the benchmark can be limited by the policy

• Can swap bonds in the portfolio to achieve duration targets

• Key: Ability to forecast interest rates. Very difficult
Individual Security Selection Strategies

- Identify mispriced securities

- In agencies, specific issues may trade rich or cheap due to
  - Supply and demand,
  - Trading special in the repo market,
  - Bid for name diversification,
  - Bid for on the runs vs. off the runs due to liquidity,
  - In anticipation of buybacks or tender offers
Managing Sector Allocation

<table>
<thead>
<tr>
<th></th>
<th>Portfolio Structure</th>
<th>Benchmark Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury</td>
<td>35%</td>
<td>46%</td>
</tr>
<tr>
<td>Agency</td>
<td>55%</td>
<td>54%</td>
</tr>
<tr>
<td>Mortgage Backed</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Corporate</td>
<td>10%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Structure based on allowable securities under the policy
Benchmarking

- Conservative approach to active management
- Portfolio matches the characteristics of a market index
- The portfolio manager actively executes trades to maintain the characteristics of the index in the portfolio
- Market risk, credit risk, and portfolio return are very similar to that of the benchmark index
Benchmarks

- An unmanaged portfolio that includes the types and maturities of securities that are permitted in the investor’s policies

- Examples
  - 0-3 Year Treasury  1.4 year duration
  - 0-5 Year Treasury  2.25 year duration
# Example - Benchmark

<table>
<thead>
<tr>
<th>Modified Duration</th>
<th>Market Value</th>
<th>Portfolio Weight</th>
<th>Benchmark Weight</th>
<th>Over/Under</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$145,794,094</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-.5</td>
<td>$</td>
<td>0%</td>
<td>17%</td>
<td>-17%</td>
</tr>
<tr>
<td>.5-1</td>
<td>$25,000,000</td>
<td>16%</td>
<td>17%</td>
<td>-1%</td>
</tr>
<tr>
<td>1-1.5</td>
<td>$26,388,970</td>
<td>17%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>1.5-2</td>
<td>$35,200,100</td>
<td>22%</td>
<td>21%</td>
<td>2%</td>
</tr>
<tr>
<td>2-2.5</td>
<td>$40,258,885</td>
<td>26%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>2.5-3</td>
<td>$20,041,200</td>
<td>13%</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>3-3.5</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>3.5-4</td>
<td>$9,844,600</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Effective Duration</th>
<th>Modified Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio</td>
<td>1.84</td>
<td>1.89</td>
</tr>
<tr>
<td>Benchmark</td>
<td>1.44</td>
<td>1.45</td>
</tr>
<tr>
<td>Difference</td>
<td>.40</td>
<td>.44</td>
</tr>
</tbody>
</table>

- **Effective Duration**
- **Modified Duration**

---

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What a Benchmark Does

- Provides guidance for investment decisions
- Keeps you focused
- Controls exposure to changes in interest rates in the portfolio
- Improves expectations in all interest rate environments
- Provides clarity of strategy communication to board
Strategy Utilizing Benchmarks

STEPS:

• Evaluate return expectations

• Determine acceptable risk tolerance

• Establish appropriate benchmark

• Establish duration targets

• Determine guidelines

• Monitor and report performance

• Rebalance the portfolio
Benchmark Objectives – Managing Risk

- Controls risk exposure in the portfolio
- Portfolio structure properly reflects risk tolerance of entity
- Target ranges in duration ensure application of risk management
Benchmark Objective - Measuring Return

• Manages the returns to expectations:
  • Performance will be close to the benchmark return
  • Variance of return will be due to variance in duration, sector weighting and maturity structure
Selection of Appropriate Benchmark

• Primary Criteria:
  • Compliance with policy and statutes
  • Risk tolerances; risk profile
  • Growth objectives

• Additional Criteria:
  • Allowable types of securities
  • Time horizon of portfolio- Core Fund
  • Maturity constraints of portfolio- Investment policy
Pure Bond Index Matching

- Lowest risk/lowest expected return vs. a benchmark

- BUT...to fully replicate the index
  - Not feasible
  - Too many bonds
  - Too costly
Enhanced indexing – less aggressive

• Invest in a large sample of bonds so that the portfolio’s risk factors match the index’s risk factors

• Match primary risk factors
  • Duration, sector, quality, and call exposure

• Minor mismatches in the risk factors
  • Sector allocation, duration, credit ratings, term structure
Mismatching index – is active management

- Objective to outperform index/benchmark
- Active portfolio management
- Can result in greater mismatching to index/benchmark in:
  - Duration
  - Market risk
  - Asset allocation
  - Credit risk
- Degree of mismatching depends on risk tolerance
Active Management Involves

- Risk management
- Yield curve analysis
- Maturity structuring
- Spread analysis
- Risk diversification
- Credit analysis
- Security selection
- Portfolio rebalancing and realignment
• Buy and Hold
• Timing
• Yield curve trade
• Maturity selection