CPI and Interest Rate Forecast
A Mix of Inflationary Forces

Crude Oil & U.S. Retail Gas

Agricultural Prices

Supply Chain Strain

Source: Bloomberg
What Drives Interest Rates?

- A LOT of things
- In general:
  - Short-term rates are impacted by:
    - Federal Reserve Monetary Policy
    - Business cycle
  - Long-term rates are impacted by:
    - Growth expectations
    - Inflation expectations
    - Uncertainty / Term premium
    - The Federal Reserve through Quantitative Easing (buying long-term bonds)
    - Issuance of bonds (supply) & investment in bonds (demand)
# Federal Reserve Policy Tool Kit

<table>
<thead>
<tr>
<th>Policy Tool (Tightening Monetary Policy)</th>
<th>Risks</th>
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</thead>
<tbody>
<tr>
<td>Raise Fed Funds Rate</td>
<td>Economic Slowdown</td>
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<td></td>
<td>Higher Unemployment</td>
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<td></td>
<td>Recession</td>
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<tr>
<td>Slow Asset Purchases (or Sell Bonds)</td>
<td>Rising Rates</td>
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<tr>
<td></td>
<td>Slower Housing</td>
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<td>Fiscal Pressure</td>
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<td></td>
<td>Corporate Earnings Pressure</td>
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<td>Reduced Market Liquidity</td>
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<tr>
<td>Reduce Forward Guidance</td>
<td>Less Certainty</td>
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</table>
What Are The Challenges of Investing With High Inflation?

- Inflation erodes the value of a bond’s coupon
  - Real interest rates (bond yield minus inflation) can turn negative
- Inflation can cause short-term and long-term rates to rise
  - Rising rates put downward pressure on bond prices
- Interest rates can move quickly and unexpectedly
- Inflation can have negative impacts on issuers’ credit quality
Fed Fights Inflation by Hiking the Fed Funds Rate

Fed was behind on inflation.

We had not seen inflation above 5.0% since 1990.

Sources: Bloomberg, PMA Asset Management
Short-Term Interest Rates

Fed Funds & 3-Month Treasury Yields

2-Year Treasury Spread to Fed Funds Rate

Sources: Bloomberg, PMA Asset Management
Erosion of Short-Term Coupon (Yield)

3-Month Real Yield & Inflation

Sources: Bloomberg, PMA Asset Management
Fed kept raising rates; They were behind

Little move in 10-year

Sources: Bloomberg, PMA Asset Management
Elevated Inflation: Persistent, not Permanent

Inflation and Wage Growth

- CPI YoY
- Core CPI YoY
- Atlanta Fed Wage Growth Tracker Overall
- Fed Target

Inflation Expectations

- 2-Year Breakeven
- 10-Year Breakeven

Quarterly CPI Forecast (YoY%)

Source: Bloomberg; As of: 4/8/22
Fed Funds Rate Expectations

Source: Bloomberg; As of April 8, 2022

### Dots Min
- 2022: 1.88
- 2023: 2.54
- 2024: 2.38

### FOMC Range
- 2022: 2.00
- 2023: 2.75
- 2024: 2.75
- Long-Term: 2.00

### FOMC Median
- 2022: 2.00
- 2023: 3.22
- 2024: 2.75
- Long-Term: 2.00

### Fed Funds Futures
- 2022: 2.00
- 2023: 3.22
- 2024: 2.75
- Long-Term: 2.00
US Treasury Curve and Forward Rates

Sources: Bloomberg
PMA Market Outlook

- Tighter Monetary Policy in 2022
- Strong Economic Growth and Persistent Inflation
- Corporate Credit and Earnings Remain Strong
- Political and Geopolitical Risks Elevated
- Market Volatility Creates Opportunities for Active Managers
- Wider Range of Potential Returns in 2022 for Stocks and Bonds
Investment Planning
Cash Flow Planning

- Formal organization and documentation of projected inflows/outflows
- Optimize your investment earnings
  - Asset-Liability matching and extending portfolio duration
- Determine excess reserves / short-term borrowing needs

Sample Cash Flow Analysis

<table>
<thead>
<tr>
<th></th>
<th>Funds Balance</th>
<th>Short-Term Investments</th>
<th>Mid-Term Investments (1-2 Years)</th>
<th>Long-Term Investments (2+ Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEC '20</td>
<td></td>
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<tr>
<td>DEC '21</td>
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<tr>
<td>DEC '22</td>
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<tr>
<td>DEC '23</td>
<td></td>
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</table>
Should I wait to invest until rates rise?
- Time in the market is more important than timing the market
- The value of time – don’t try to time the market

<table>
<thead>
<tr>
<th>Invest</th>
<th>$ 10,000,000</th>
<th>$ 10,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>1.56%</td>
<td>1.66%</td>
</tr>
<tr>
<td>Period</td>
<td>365</td>
<td>335</td>
</tr>
<tr>
<td>Income</td>
<td>$ 156,000</td>
<td>$ 152,356</td>
</tr>
</tbody>
</table>
Stay Invested

- Investing longer now “locks in” income
- The market is efficient

Example:

<table>
<thead>
<tr>
<th>Investment Amount</th>
<th>$10,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Year Rate</td>
<td>1.56%</td>
</tr>
<tr>
<td>6-Month Rate</td>
<td>1.03%</td>
</tr>
<tr>
<td>Breakeven Rate</td>
<td>2.09%</td>
</tr>
</tbody>
</table>
Fed drives short-term rates
Fed is expected to hike rates multiple times in 2022
Longer-term securities are pricing in rate hikes
Inflation is backward looking
Inflation expectations are priced into the curve
Real short-term rates can turn deeply negative
Exposure across the curve provides diversification
Don’t try to time the market
Financial strategies for peace of mind

- Client Service Focus
- Disciplined Investment Philosophy
- Strategic Portfolio Allocation
- Experienced Investment Team
Navigating High Inflation – Part II

Tammie Beckwith Schallmo
Senior Vice President, Managing Director
PMA Securities, LLC

April 21, 2022
Today’s Capital Markets Discussion Topics

- Bond Market Update
- Managing Interest Rate Risk for a Refunding
The chart to the left is a “AAA” rated index known as the “MMD”.

An issuer’s bonds sell at a “spread” to the index due to its own credit rating and the “Illinois Premium”.

*The Municipal Market Data “MMD” is a AAA municipal bond market index produced by TM3. As of April 11, 2022.
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Since January 3, 2022, rates in the MMD have increased as follows:

- 5-year: 1.61%
- 10-year: 1.39%
- 20-year: 1.34%

*The Municipal Market Data "MMD" is a AAA municipal bond market index produced by TM3. As of April 11, 2022.
Dispersion of Historical Interest Rates by Range*

Since January 1, 1990, the 10-year MMD has been lower than it is today 25% of the time.

Two months ago, the 10-year MMD had been lower 6% of the time.

*The Municipal Market Data “MMD” is a AAA municipal bond market index produced by TM3. As of April 11, 2022.
Managing Interest Rate Risk for a Refunding
Tools to Manage Market Risk for Refunding Tax-Exempt Debt

1. Taxable Advance Refunding
   ▶ An advance refunding is a refunding that closes more than 90 days before the call date
   ▶ A Federal tax law change is necessary to allow for a tax-exempt advance refunding for bonds originally issued for new money

2. Tax-Exempt Current Refunding
   ▶ Within 90 days of the call date

3. Forward Settlement Tax-Exempt Current Refunding
   ▶ See next slide for more details
What is a Forward Settlement Current Refunding?

- In a Forward, the interest rate is set in the present, but the bonds close in the future.
- This strategy allows a College to lock-in a rate above the current market, mitigating market risk.
  - Allows refunding bonds to be issued tax-exempt.
  - The escrow is more efficient.
  - Reduces the Break-Even Market Movement.
- Large commercial banks may propose different terms that are not in a typical public offering.
  - For example, a “default rate” and a “taxable rate”
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