NY Fed Symposium on Inflation

Market-based measures of inflation

Not the market’s best forecast

- Risk-adjusted Inflation forecasts: overweight bad states of the world, and massively overweights very bad states (disasters)
  - Hard to undo risk-adjustment to back out actual forecast.
  - Policymakers change the risk-adjustment.

1. Break-even Inflation rate

\[
y_t^{N,Treas} = y_t^{N,TIPS} + \mathbb{E}_t^Q [\pi_t,T]
\]
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- Risk-adjusted Inflation forecasts:

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Market-based measures of inflation

Forecasting Inflation

Inflation forecasts under risk-neutral measure:

1. Break-even Inflation rate

\[ y_{t,N,Treas}^{N,TIPS} = y_{t,N,TIPS} + E_t^Q[\pi_{t,T}] \]

2. Rate on Inflation Swaps

\[ E_t^Q[\pi_{t,T}] \]
We can take TIPS, add zero-coupon inflation swaps to swap indexed into fixed payments, and manufacture a synthetic Treasury
  • LOP implies synthetic and actual Treasurys have some price
  • Synthetic Treasurys tend to be cheap relative to an actual Treasury
Yields on Treasurys are too low relative to yields on TIPS
Break-even inflation is lower than inflation swap rate
  • Gap increases during times of dislocation in financial markets (e.g. GFC) (Fleckenstein, Longstaff, and Lustig, 2014)
Demand for safety and liquidity benefits mainly Treasurys, not TIPS
  • Treasurys earn larger safety and liquidity convenience yields (Krishnamurthy and Vissing-Jorgensen, 2012) than TIPS

Treasurys are always Expensive
Breakeven vs Inflation Swap in U.K.

U.K. Market-based Measures

- BE 3YR
- Swap 3YR
Challenges to Measurement

01 Treasurys as Safe Assets: Impact of Convenience Yields on Treasurys.

02 Treasurys as CB Policy Target and Tool.

03 Excess Sensitivity of long end: What about Term Structure of Expected Inflation?
Complicate Inference

- Suppose Treasurys earn (safety and liquidity) convenience yields but TIPS don’t:
  \[ y_{t,t+1}^{N,Treas} = E_t^Q [e^{-r_{t,t+1}N}] - \lambda_t^N \]

- Suppose convenience yields on Treasurys increase (e.g. in response to volatility in markets)
  \[ y_{t,t+1}^{N,Treas} \downarrow + y_{t,t+1}^{N,TIPS} + BE_t^N \downarrow \]

  - If convenience yields on TIPS don’t increase, then the break-even decreases
  - Treasurys become more special relative to TIPS and Break-evens decline,
  - We mistakenly infer that expected inflation declines under Q

\[ y_{t,t+1}^{N,Treas} \downarrow + y_{t,t+1}^{N,TIPS} + E_t^Q [\pi_t + N] \downarrow \]
Corporate vs. Treasury Breakeven

Purging Convenience Yields from Break-evens

• Construct a *synthetic Treasury* from investment grade bond using CDS
• Then compute the break-even
  • Markit CDX Investment grade
  • Matched duration of CDX spread to duration of Bloomberg US Corporate Investment Grade Index
  • Recompute Corp. Break-even as Credit-hedged Corp. minus TIPS
• Currently duration is 7 yrs
Purging Convenience Yields

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Long-run expected inflation may be well above target
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Purchases of U.S. Treasurys
LSAPS decrease *measured expected inflation*

- Fed buys mostly Notes and Bonds, not TIPS (only 1.4% of holdings)
- Suppose convenience yields on Treasuries increase in response to large scale asset purchases

\[ y_{t,Treasury}^{N} = E_{t}^{Q} [e^{-r_{t,t+N}}] - \lambda_{t}^{N} \]

- If convenience yields on TIPS don’t increase, then expected inflation under risk-neutral measure decreases

\[ y_{t,Treasury}^{N} = y_{t,TIPS}^{N} + B E_{t}^{N} \]

- When Fed buys Treasuries, they become more special relative to TIPS

- LSAPs mechanically decrease measured expected inflation; opposite of the effect it’s supposed to have
Large Scale Asset Purchases

LSAPS decrease *measured expected inflation*

- **Nominal duration risk channel**
  - Fed removes nominal interest rate risk from market by buying Treasurys (not TIPS)
  - Larger decline in nominal yields than in real yields
    - QE changes the risk-neutral measure by removing nominal interest rate risk from the market
    - Fed is changing the risk-neutral measure, not expected inflation (under the actual measure)
  - Measure of expected inflation declines mechanically
    \[
    y_t^{N,Treas} = y_t^{N,TIPS} + \beta E_t^{N}
    \]
  - not just about current interventions, but the signaled commitment to future interventions
Price Discovery Impaired

• Bond markets did not do a great job of forecasting the recent inflation spike (only towards the end of 2021)
• CB interventions may not improve the functioning of bond markets, but in fact may actively hamper price discovery.
• Speculators may have less of an incentive to invest in learning about fundamentals as soon central banks decide to intervene based on the bond price. (JoF, Bond and Goldstein, 2015)
• version of Lucas critique
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Term Structure

Excess Sensitivity

• Longer tenors seem excessively sensitive to news (mean reversion!)
  • Note how strongly 5Y (even 10Y) comoves with 3Y for example

• Hard to reconcile with large class of no-arbitrage models that feature mean reversion (Kelly and Giglio, QJE, 2018)

Inflation Swaps
Summary

Threats to Measurement

Market-based measures of Future Inflation.

- Decrease when safe asset demand for Treasurys increases.
- Decrease when Fed engages in LSAPs by buying Treasurys.
- May be less reliable because of Impaired Price Discovery in Bond Market

Implications for Today

Current market-based measures of Future Inflation.

- Currently, may be lowered by safe asset demand for Treasurys (last 4 months).