Discussion of QE Papers

Monika Piazzesi
Stanford & NBER

Feb 25, 2011
Quantitative Easing

- very interesting!

- does it matter what the Fed buys/sells? Treasuries vs. Mortgage Backed Securities, Corporate Bonds etc.

- what is the effect on
  - the overall level of interest rates?
  - long vs. short
  - real vs. nominal
  - safe vs. risky
  - future interest rates, expected returns
QE papers

- mostly OLS regression evidence
- regress changes in interest rates on contemporaneous/lagged Fed purchases
- empirical findings (AK, HW, KVJ):
  - negative regression coefficients!
  - regression coefficient larger (in absolute value)
    if interest rate
    - longer (AK, HW)
    - real, not nominal (KVJ)
    - safer (KVJ as in previous KVJ)
- if purchase of risky (KVJ)
purchases predict excess returns, over 75% R2 (HW)
- findings complement/confirm existing evidence:

Theoretical motivation for QE papers

- Vayanos & Vila (2009), discrete time version in Hamilton & Wu
- myopic mean-variance investors ("arbitrageurs")
- other investors ("preferred habitat", but details not important)
- empirical work based on Euler equations of arbitrageurs
Basic portfolio choice

- myopic mean-variance investors

\[ E_t (r_{t+1}^w) - \frac{\gamma}{2} \text{var}_t (r_{t+1}^w) \]

- \( \gamma \) is risk aversion

- return on wealth

\[ r_{t+1}^w = r_t^f + \alpha_t r_{t+1}^e \]

- \( r_{t+1}^e \) = excess return on long bonds with mean \( E_t (r_{t+1}^e) \) and variance \( \Sigma_t \)

- optimal portfolio without constraints:

\[ \alpha_t = \frac{1}{\gamma \Sigma_t^{-1}} E_t (r_{t+1}^e) \]

- Euler equation for excess returns on long bonds

\[ E_t (r_{t+1}^e) = \gamma \Sigma_t \alpha_t = \gamma \text{cov} (r_{t+1}^e, r_{t+1}^w) \]
Euler equation and "supply effects"

- Euler equation for excess returns on long bonds

\[ E_t [r_{t+1}^e] = \gamma \sum_t \alpha_t = \gamma \text{cov}(r_{t+1}^e, r_{t+1}^w) \]

- Bonds with large wealth shares have high expected excess returns
- Wealth shares forecast excess returns
  \[ \rightarrow \text{regress excess returns on lagged bond positions} \]
  \[ \text{find negative coefficient!} \]
- For long/risky bonds, \( E_t [r_{t+1}^e] \approx \text{long/risky - short spreads} \)
- Drop in wealth share on long or risky bonds \( \Rightarrow \) lower spreads!
  \[ \rightarrow \text{regress change in spreads on Fed purchases of long or risky bonds} \]
  \[ \text{find negative coefficient} \]
Euler equation and "supply effects"

- Euler equation for excess returns on long bonds

\[ E_t [r_{t+1}^e] = \gamma \sum_t \alpha_t = \gamma \text{cov} (r_{t+1}^e, r_{t+1}^w) \]

- important:
  - Euler equation holds in equilibrium regardless of rest of economy
  - no assumptions on preferred habitat investors needed
  - only assumption: \( \exists \) unconstrained mean-variance investors

- Roll critique of CAPM applies here:
  want comprehensive measure of wealth
More ambitious test

- comprehensive measure of wealth,
  forward-looking Epstein-Zin investors
- long bond shares don’t move much
- effects tiny once comprehensive measure of wealth is used
Back to the regression evidence

- few observations: HW 1990-2007, KVJ, AW are event studies standard errors??
- right-hand side variables:

![Graphs of Treasury factors 1, 2, and 3 from 1990 to 2007.](image)
Conclusion

- very interesting agenda
- good first regression-based results with QE1, QE2 data
- want much stronger connection between a model with bond positions and data
  - need to get away from CAPM type specifications
  - who is trading? data on their exposures, motivate their objective function, test their Euler equations
  - helps with economic interpretation of results (endogeneity), small samples, etc.