Discussion of QE Papers

Monika Piazzesi
Stanford & NBER

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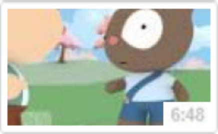
Quantitative Easing

- very interesting!



Quantitative Easing Explained

What the Federal Reserve is up to, and how we got here. Created by: Omid Maleka
www.omidmalekan.com)

by malekanoms | 3 months ago | **4,265,221 views**

- 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
  contemporanous/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:

  Kidwell 1983, Longstaff 2002, Bernanke, Reinhart & Sack 2004, Taylor & Williams 2009, KVJ 2010, Greenwood & Vayanos 2010, Adrian et al. 2010, Hancock & Passmore 2011, Swanson 2011 etc.

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

$$E_t\left(r^w_{t+1}\right) - \frac{\gamma}{2} var_t\left(r^w_{t+1}\right)$$

  - γ is risk aversion

- return on wealth

$$r^w_{t+1} = r^f_t + \alpha'_t r^e_{t+1}$$

- r^e_{t+1} = excess return on long bonds
  with mean $E_t\left(r^e_{t+1}\right)$ and variance Σ_t
- optimal portfolio without constraints:

$$\alpha_t = \frac{1}{\gamma}\Sigma_t^{-1} E_t\left(r^e_{t+1}\right)$$

- Euler equation for excess returns on long bonds

$$E_t\left(r^e_{t+1}\right) = \gamma \Sigma_t \alpha_t = \gamma \text{cov}\left(r^e_{t+1}, r^w_{t+1}\right)$$

Euler equation and "supply effects"

- Euler equation for excess returns on long bonds

$$E_t\left[r^e_{t+1}\right] = \gamma \Sigma_t \alpha_t = \gamma \text{cov}\left(r^e_{t+1}, r^w_{t+1}\right)$$

- bonds with large wealth shares have high expected excess returns
- wealth shares forecast excess returns

  $\rightarrow$ regress excess returns on lagged bond positions
  find negative coefficient!
- For long/risky bonds, $E_t\left[r^e_{t+1}\right] \approx$ long/risky - short spreads
- Drop in wealth share on long or risky bonds = lower spreads!

  $\rightarrow$ regress change in spreads on Fed purchases of long or risky bonds
  find negative coefficient

Euler equation and "supply effects"

- Euler equation for excess returns on long bonds

$$E_t\left[r^e_{t+1}\right] = \gamma \Sigma_t \alpha_t = \gamma \text{cov}\left(r^e_{t+1}, r^w_{t+1}\right)$$

- 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:

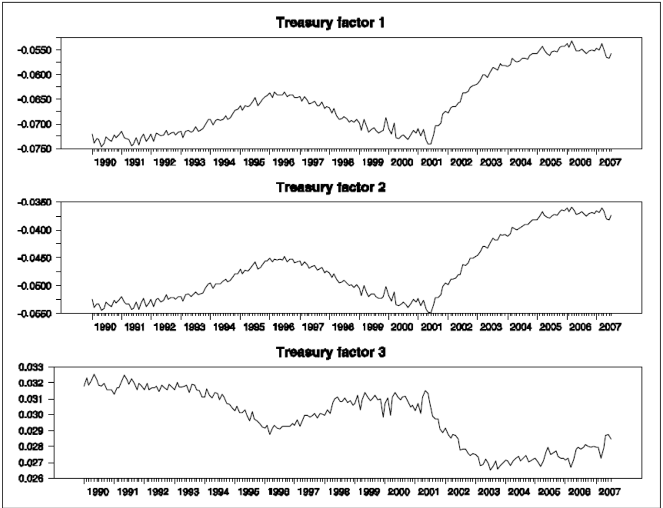
  want comprehensive measure of wealth

More ambitious test

- Piazzesi & Schneider 2008, "Bond Positions, Expectations & the Yield Curve", Federal Reserve Bank of Atlanta Working Paper
- 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:



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.