Discussion of "The Banking View of Bond Risk Premia" by Haddad & Sraer

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short summary

- banks are marginal investors for interest rate risk
- Euler equation checks for banks
- measure of aggregate bank exposure predicts bond returns

comments

1. nice contribution to an important agenda
2. model:
   a. objective function of banks
   b. equilibrium interest rates
3. quantitative implementation
   a. exposure through derivatives
   b. predictability in samples with few recessions

1. important agenda

- Euler equations of households
  - with aggregate NIPA data (Hansen & Singleton 1982, etc
    or individual CEX, PSID data (Brav, Constantinides, Geczy 2002, etc)
- households do not participate in many markets
  - equities in 1980s/1990s, many fixed income instruments (MBS), etc
- banks participate, they are marginal investors
- Euler equations of banks
  - great position data from regulatory filings by banks
  - many different fixed income instruments, but factor structure helps!
    level of safe interest rates = 1st principal component in safe bonds
    other factors, for example: credit risk
- example: Bocola 2015 JPE, Italian banks hold Italian gov bonds

2.a objective function in the model

- banks maximize myopic mean-variance criterion
- motivated in the paper:

  overlapping generations, live *dt* (Greenwood & Vayanos 2014)

  log utility
- may be a useful first step,

  but are at the heart of Euler equation tests for banks
- bank shares are held by long-lived households
- other constraints: capital requirements, VaR etc.
- principal-agent conflicts

2.b equilibrium bond prices in the model

- equilibrium (log) price of τ-year bond

$$-\log P_t^{(\tau)} = A_r(\tau)\, r_t + A_g(\tau)\, g_t + C(\tau)$$

- affine model with 2 factors: interest rate r_t, average gap g_t
- in particular, any 2 (log) bond prices ....

$$\begin{pmatrix} -\log P_t^{(1)} \\ -\log P_t^{(2)} \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ A_r(2) & A_g(2) \end{pmatrix} \begin{pmatrix} r_t \\ g_t \end{pmatrix} + \begin{pmatrix} 0 \\ C_g(2) \end{pmatrix}$$

..... can be inverted to get the two factors

$$\begin{pmatrix} r_t \\ g_t \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ A_r(2) & A_g(2) \end{pmatrix}^{-1} \begin{pmatrix} -\log P_t^{(1)} - 0 \\ -\log P_t^{(2)} - C_g(2) \end{pmatrix}$$

- factors are "spanned" by bond prices, equivalently interest rates

2.b equilibrium bond prices in the model ctd.

- in equilibrium, expected excess return on long bonds

$$A_r(\tau)\,\lambda_{r,t} + A_g(\tau)\,\lambda_{g,t}$$

  where

$$\lambda_{i,t} = g_t \gamma \sigma_i^2 \int_0^\infty e^{-\theta\tau} A_i(\tau)\, d\tau$$

- expected excess returns are linear in gap g_t
  $\Longrightarrow$ run OLS of excess returns from t to $t+1$ on time t gap

- interest rates should predict excess returns as well as gap!

- gap is better predictor than yields:
  may want to modify model so that gap is unspanned factor

3.a exposure data in quantitative implementation

- measurement of risk exposure by U.S. banks:

  income gap = (short assets − short liabilities)/ total assets
  averaged across banks

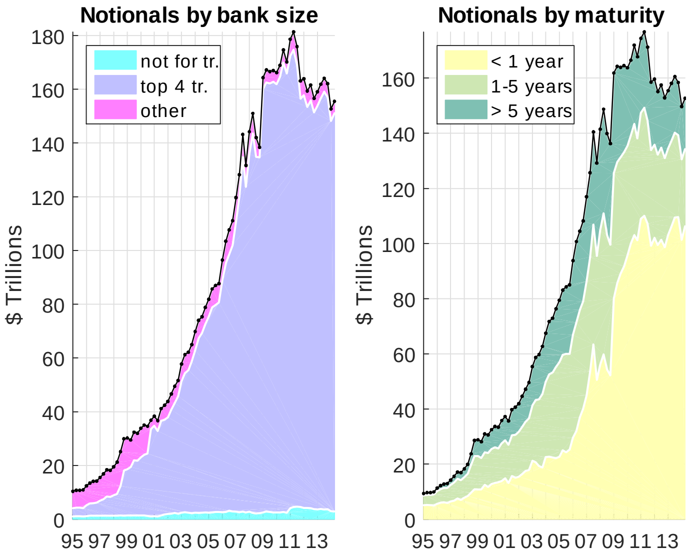
- simple, easy to compute, textbooks

- exposure through derivatives?

  HS: compute gap for banks who have zero notionals of derivatives,
  "nonuser" series has 93% correlation with average gap

  should average gap be different?

3.a exposure data in quantitative implementation ctd.

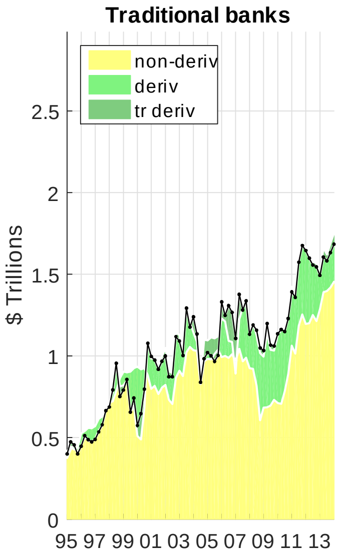


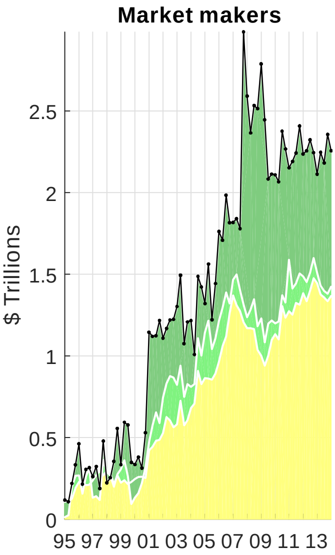
Begenau, Piazzesi & Schneider 2015, Figure 4

3.a exposure data in quantitative implementation ctd.

- banks have many different fixed income instruments
  (e.g., various loans, MBS, ABS, Treasuries, etc.)
- strong factor structure
- represent bank positions as simple factor portfolios
- figure plots $ portfolio holdings of 5-year swap bond that represent the interest-rate risk in
  - overall positions
  - for trading derivatives
  - not–for-trading derivatives
  - other positions (loans & securities etc)

3.a exposure data in quantitative implementation ctd.





Begenau, Piazzesi & Schneider 2015, Figure 10

3.b predictability in samples with few recessions

- gap data 1986:Q3 - 2013:Q3
- predict excess returns over next year on τ-maturity bond

$$rx_{t+1}^{(\tau)} = a + b\text{rhv}_t$$

FB $f_t^{(\tau)} - r_t$				CP: $\gamma^\top f_t$			
τ	b	t(b)	R^2	τ	b	t(b)	R^2
2	0.23	0.5	0.01	2	0.46	3.7	0.12
3	0.50	0.9	0.03	3	0.87	3.8	0.11
4	0.64	1.2	0.04	4	1.24	4.1	0.11
5	0.66	1.3	0.04	5	1.43	4.1	0.08

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- predict excess returns over next year on τ-maturity bond

$$rx_{t+1}^{(\tau)} = a + b\text{rhv}_t$$

FB $f_t^{(\tau)} - r_t$				CP: $\gamma^\top f_t$				HS: gap_t			
τ	b	t(b)	R^2	τ	b	t(b)	R^2	τ	b	t(b)	R^2
2	0.23	0.5	0.01	2	0.46	3.7	0.12	2	-13.5	-3.0	0.18
3	0.50	0.9	0.03	3	0.87	3.8	0.11	3	-28.9	-3.6	0.23
4	0.64	1.2	0.04	4	1.24	4.1	0.11	4	-40.5	-4.0	0.22
5	0.66	1.3	0.04	5	1.43	4.1	0.08	5	-50.4	-4.4	0.22

- nice: large int rate exposure = small gap = high exp excess returns

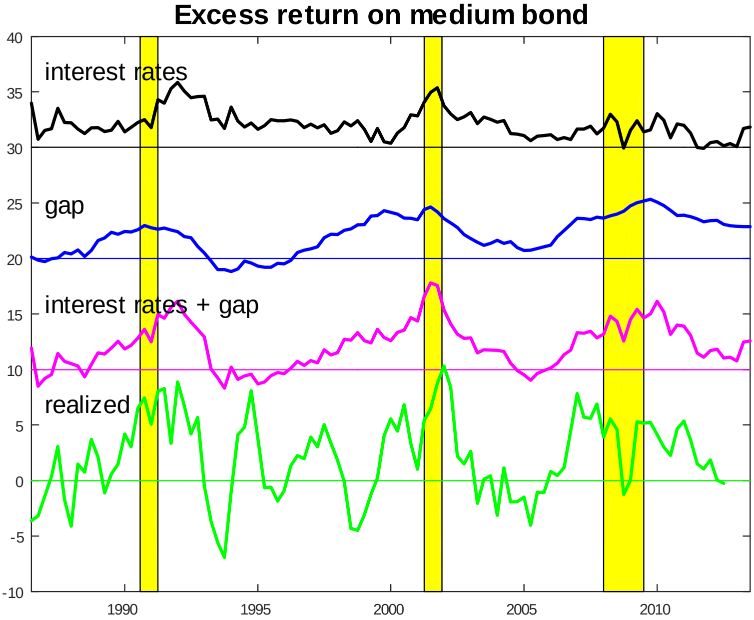
3.b predictability in samples with few recessions

- gap data 1986:Q3 - 2013:Q3
- predict excess returns over next year on τ-maturity bond

both: $rx_{t+1}^{(\tau)} = a + b\left(\gamma^\top f_t\right) + c \text{ gap}_t$

τ	b	t(b)	c	t(c)	R^2	unr. R^2
2	0.47	5.3	-14.4	-3.5	0.33	0.50
3	0.90	6.0	-30.5	-4.2	0.37	0.49
4	1.27	6.6	-42.8	-4.6	0.36	0.47
5	1.48	6.9	-53.0	-4.9	0.33	0.43

- higher R^2 in unrestricted regressions on interest rates, gap
- according to model, gap should be driven out by interest rates



Excess return on medium bond
interest rates
gap
interest rates + gap
realized
40
35
30
25
20
15
10
5
0
-5
-10
1990
1995
2000
2005
2010

summary of comments

1. nice contribution to an important agenda
2. model:

    a. objective function of banks – myopic?

    b. equilibrium interest rates – affine model without unspanned factors
3. quantitative implementation
    a. exposure through derivatives

    b. predictability in samples with few recessions

    more on cross sectional implications
    ("risk aversion parameters" of banks, etc)