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“Predictive Power of Forward Rate: Evidence from MGS Market”

by
**N Vee Heng, A M Nassir, M Ariff and S
Mohamad (Oct 04)**

Discussed by
Pongsak Hoontrakul

Sasin of Chulalongkorn Univ., Bangkok
Email: Pongsak@Hoontrakul.com
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**Checklist: “Predictive Power of Forward Rates:
Malaysian Gov’t Securities Market**

	Excellent	good	Ave	Below Ave	Poor
The paper is			X		
The topic is			X		
The contribution to literature is			X		
Reader’s interest would be		X			
Methodology				X	
Literature Review				X	
Writing Style is			X		

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General Comments

- The topic is interesting and timely.
- Using 108 quarterly compiled MGS data into 15 bond portfolios from March 1976 to Dec. 02, the general findings are as below:
 - Implied forward rates only for bonds with 2 to 5.5 years can predict future spot rate. And the predicting power increases over time.
 - Expectation Hypothesis is rejected for any bonds with maturity greater than 5.5 years.
 - This is consistent with Fama and Bliss (1987)

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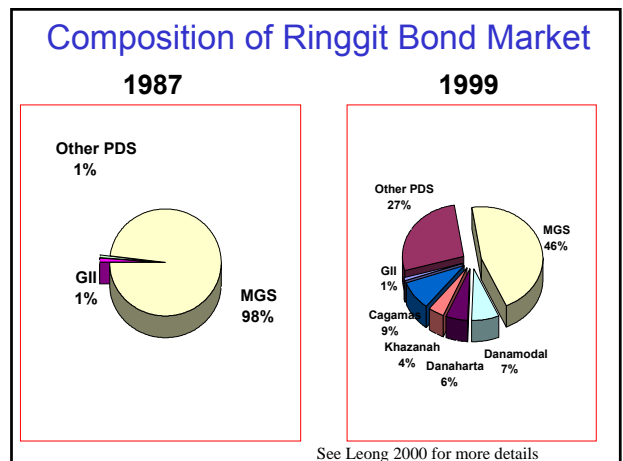
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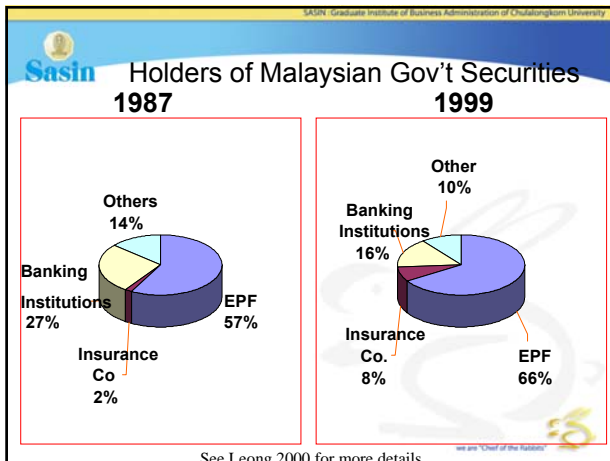
Specific Comments on “Bond Market in Malaysia” Section

- Better Writing and Chronological Order on p.
- More Graphic Presentation on pp. 4 to 8

See Lillian Leong June 2000

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Specific Comments on “Theory and Methodology” section

- More Discussion on the Expectation Hypothesis (EH) and its related theory
- Better Visual Presentation

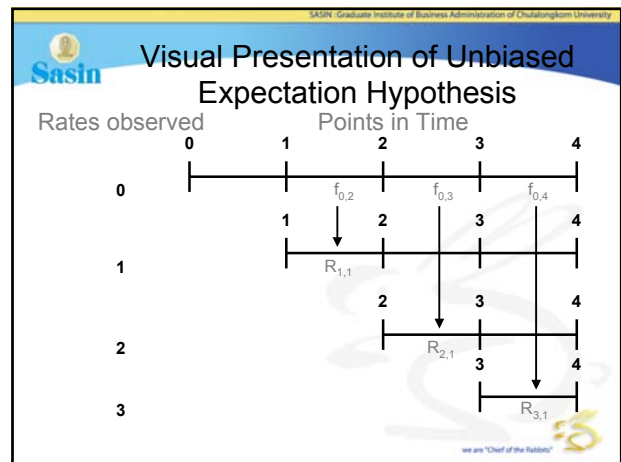
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The Expectations Theory

An individual with a 5-year investment horizon could purchase a 5-year bond and hold it to maturity. [Main Assumption: Bonds of different maturities are perfect substitutes.]

Alternatively, this individual could buy a 1-year bond. When it matures, he could buy another 1-year bond, continuing in this way to buy 5 one-year bonds.

If this individual were indifferent to the risk associated with the unknown future interest rates, then there should be an equivalence in the expected return between these two strategies.



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The expectations hypothesis

- Forward rates are unbiased estimators of future interest rates

$$f_{t+1} = E(r_{t+1})$$

- The slope of the term structure reveals investors expectations of future short rates
 - The term structure is upward-sloping when the forward rent (t + 1) is higher than the YTM (t)

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Expectations Hypothesis & Term Structure Facts

Explains why yield curve has different slopes:

1. When short rates expected to rise in future, average of future short rates = i_{nt} is above today's short rate: therefore yield curve is upward sloping
2. When short rates expected to stay same in future, average of future short rates are same as today's, and yield curve is flat
3. Only when short rates expected to fall will yield curve be downward sloping

Expectations Hypothesis explains Fact 1 that short and long rates move together

1. Short rate rises are persistent
2. If $i_t \uparrow$ today, i_{t+1}, i_{t+2} etc. $\uparrow \Rightarrow$ average of future rates $\uparrow \Rightarrow i_{nt} \uparrow$
3. Therefore: $i_t \uparrow \Rightarrow i_{nt} \uparrow$, i.e., short and long rates move together

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Sasin Expectations Hypothesis & Term Structure Facts

Explains Fact 2 that yield curves tend to have steep slope when short rates are low and downward slope when short rates are high

1. When short rates are low, they are expected to rise to normal level, and long rate = average of future short rates will be well above today's short rate: yield curve will have steep upward slope
2. When short rates are high, they will be expected to fall in future, and long rate will be below current short rate: yield curve will have downward slope

Doesn't explain Fact 3 that yield curve usually has upward slope
Short rates as likely to fall in future as rise, so average of future short rates will not usually be higher than current short rate: therefore, yield curve will not usually slope upward

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- Empirically we know that the expectations hypothesis does not hold fully
- However:
 - Steep yield curves are interpreted by many professionals as a warning sign of interest rate increases
 - The yield curve is a good predictor of the business cycle. When the yield curve is steeply upward-sloping the probability of a recession is far lower than when it is inverted

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Sasin Theories used to explain term structure

- **Expectations Hypothesis**
 - simplest
 - forward rate is expected future spot rate
 - geometric average
 - Forward rates equal expected spot rates
 - Slope of term structure indicates expected future change in interest rates.
 - problem: does not fit the data

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Sasin Evaluation of expectations hypothesis

- It explains:
 - why bonds of different maturities move together, and
 - why yield curves are downward sloping when current interest rates are high and upward sloping when current interest rates are low
- It does not explain why yield curves are generally upward sloping (unless forecasts of future interest rates are biased)

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Sasin Naive estimation:

$${}_tSR_n = \alpha + \beta_t FR_n + e_t \quad (3.15)$$

$$\Delta {}_tSR_n = \alpha + \beta_t \Delta FR_n + e_t \quad (3.16)$$

- $H_0: \alpha = 0, \beta = 1$ vs. $H_1: \alpha \neq 0, \beta = 0$ (p. 15)

⇒ Reject H_0 - the Expectation Hypothesis is rejected.

⇒ What is the rational for grouping (on p. 17)?

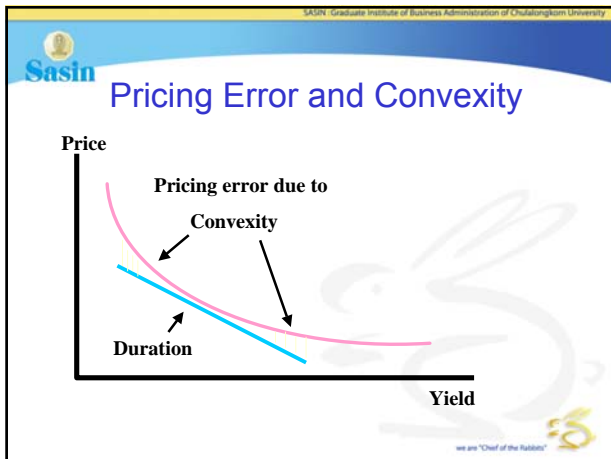
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Sasin Term Structure

- To examine how the interest rates move over time we examine government securities with varying maturities
- also called **yield curve**

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- ## Term Structure Facts to be Explained
1. Interest rates for different maturities move together over time
 2. Yield curves tend to have steep upward slope when short rates are low and downward slope when short rates are high
 3. Yield curve is typically upward sloping
- ### Three Theories of Term Structure
1. Expectations Theory
 2. Segmented Markets Theory
 3. Liquidity Premium (Preferred Habitat) Theory
 - A. Expectations Theory explains 1 and 2, but not 3
 - B. Segmented Markets explains 3, but not 1 and 2
 - C. Solution: Combine features of both Expectations Theory and Segmented Markets Theory to get Liquidity Premium (Preferred Habitat) Theory and explain all facts
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Why were we interested in this cointegration problem?

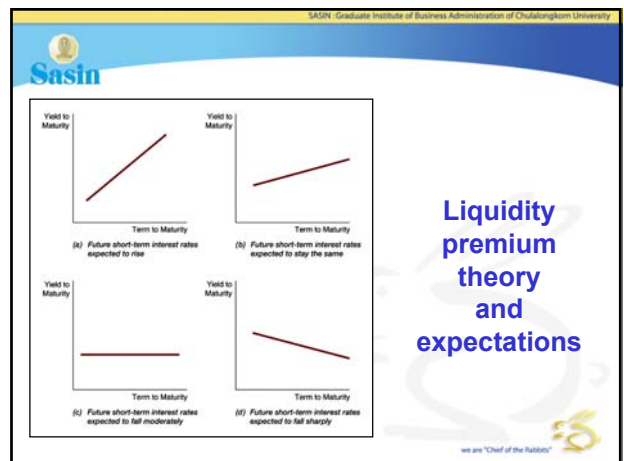
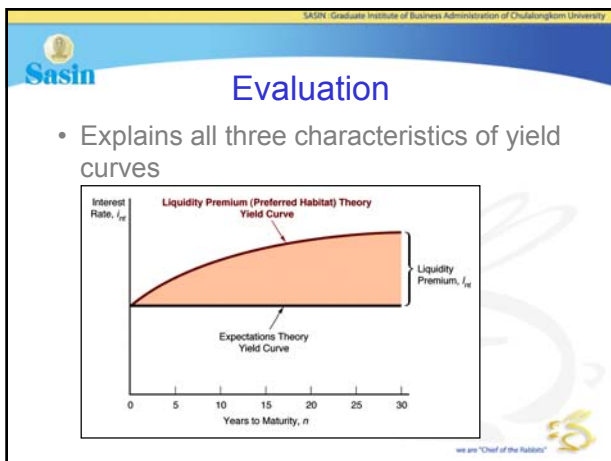
- *Expectations hypothesis*
 - “choosing to hold long-term vs. short-term bonds hinges on investors’ expectations about future interest rates”
 - hold liquidity and risk constant

$$R_{k,t} = (1/k) \sum E_t R_{1,t+j+1} \Rightarrow S_{k,1,t} = R_{k,t} - R_{1,t}$$

∴ long and short rates should be attracted (cointegrated) to each other

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- ## Risk Structure: Summary
- The risk structure of interest rates is explained by the following factors and term premia.
- **Default risk.** As this risk ↑, the risk premium ↑
 - **Liquidity.** As liquidity ↑, the risk premium ↓
 - **Income tax considerations.** If a bond has a favourable tax treatment (as do municipal bonds in the U.S.), its interest rate will be lower (and thus the risk premium lower)
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Adjusted Forward Rate Forecast

- To allow for liquidity premiums in our formula, we subtract it out.

$$i_{t+1}^e = \frac{(1 + i_{2t} - l_{2t})^2}{(1 + i_t)} - 1$$

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Conclusions EH

- Some would argue that the MRP $\neq 0$, and hence the PEH is incorrect.
- Most evidence supports the general view that lenders prefer S-T securities, and view L-T securities as riskier.
- Thus, investors demand a MRP to get them to hold L-T securities (i.e., MRP > 0).

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Reference

Batten, J., T. Fetherson and P. Hoontrakul [2005*] "Factor Affecting the Yield of Emerging Market Issuers in Int'l Bond Market: Evidence from the Asia Pacific Region", working paper, Sasin of Chulalongkorn Univ., Thailand.

Fama, E. F. and R. R. Bliss (1987) "The information in long maturity forward rates", American Economic Review (43), 339-356.

Leong, Lillian (June 2000) "Malaysia's Experience in Developing the Government Bond Market", presentation, Bank Negara Malaysia

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END

I love emails.
Any comments are welcome
At Email : pongsak@hoontrakul.com

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