

TERM STRUCTURE OF INTEREST RATES(2)

SEGMENTED MARKETS THEORY, LIQUIDITY PREMIUM THEORY

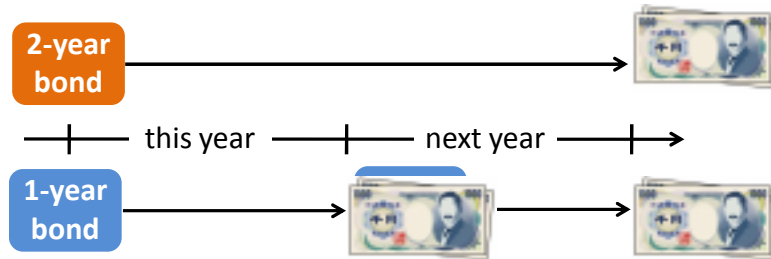
Assumptions of the Segmented Markets Theory

B1. No Substitutability

For investors, bonds with different maturities are **COMPLETELY DIFFERENT**, and never substitutable.

B.2 Preference for Shorter Maturity

Investors usually prefer short-term bonds to long-term bonds.



Investors regard the two strategies as completely different, and never try to substitute one for another under any situation. Moreover, investors usually prefer to take the latter strategy, composed of short-term bonds.

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No substitutability among different maturities

→ No effects of one market on another

→ The yields on different-maturity bonds are SEPARATELY DETERMINED in their segmented markets.

+ Preference for short-term bonds

→ Relatively larger demands for short-term bonds

→ For shorter-term bonds, higher prices

↔ For SHORTER MATURITIES, LOWER YIELDS

Term structure implied
by the segmented markets theory

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Segmented Markets Theory and the FACTS

Explains the Fact 3;
preference for short maturity implies ALWAYS
UPWARD-SLOPING yield curve.

Does NOT explain the Fact 1;

no systematic relationship among short- and
long-term yields implies NO COMOVEMENT.

Does NOT explain the Fact 2;

always upward-sloping yield curve EXCLUDES
the possibility of downward-sloping curve.

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Assumptions of the Liquidity Premium Theory

C1. Imperfect Substitutability

For investors, bonds with different maturities are
substitutable, but only IMPERFECTLY.

C2. Preference for Shorter Maturity

Investors usually prefer short-term bonds to
long-term bonds.

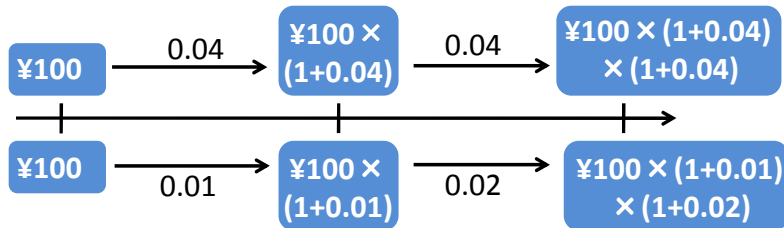
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EXAMPLE

2-year bond with 4% yield

1-year bond with 1% yield

Next year's 1-year bond with 2% EXPECTED yield



Yield from roll-over < Yield from buy-and-hold

What happens next is ...

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Yield from roll-over < Yield from buy-and-hold

- ▶ Everyone substitutes 2-year bonds for 1-year bonds.
- ▶ Price of 2-year bond ↑ Price of 1-year bond ↓
Interest rate on 2-year bond ↓ Interest rate on 1-year bond ↑
- ▶ The process stops BEFORE two yields are equal because two bonds are not perfect substitutes.

$$(1 + 0.01)(1 + 0.02) \lll (1 + 0.04)^2$$

$$(1 + 0.015)(1 + 0.02) \ll (1 + 0.035)^2$$

$$(1 + 0.02)(1 + 0.02) < (1 + 0.03)^2$$

$$(1 + 0.3)(1 + 0.2) = (1 + 0.25)^2$$

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Liquidity Premium

$$0.02 + 0.02 < 2 \times 0.03$$

$$(0.02 + 0.02)/2 < 0.03$$

$$(0.02 + 0.02)/2 + \boxed{0.01} = 0.03$$

LIQUIDITY PREMIUM

Due to relatively high liquidity,
short-term yield can be lower than long-term yield

Investors require long-term bonds
to have extra yields relative to short-term bonds.

LIQUIDITY PREMIUM

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To be more general ...

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

n -year bond rate must equal
the average of n one-year bond rates
plus the liquidity premium for n -year bond.

$i_{1,t+i}^e \dots$ interest rate on a one-year bond
 i year ahead that we expect "today"

$i_{n,t} \dots$ today's interest rate on an n -year bond

$l_{n,t} \dots$ liquidity premium for n -year bond

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Implications for Yield Curves

Long-term yields are higher than the average of short-term yields by the liquidity premium.

Liquidity premium is larger for longer maturity.

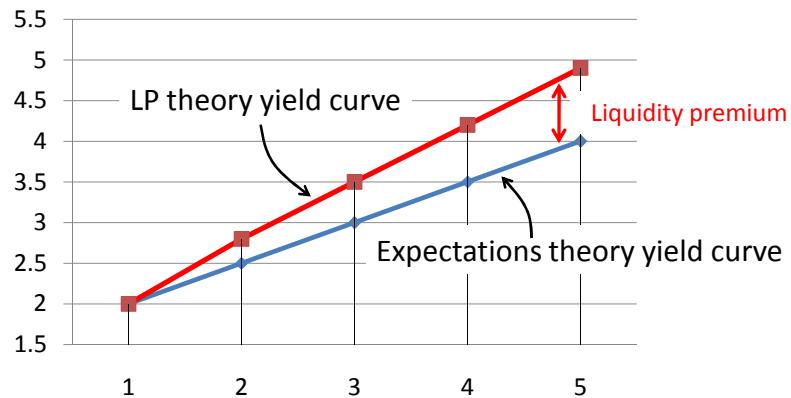
Expectations of future one-year rates

	2%	3%	4%	5%	6%	
2-year rate	2.5%					$2.5+0.1=2.6\%$
3-year rate	3.0%					$3.0+0.2=3.2\%$
4-year rate	3.5%					$3.5+0.3=3.8\%$
5-year rate	4.0%					$4.0+0.4=4.4\%$

Expectations theory predicts ...

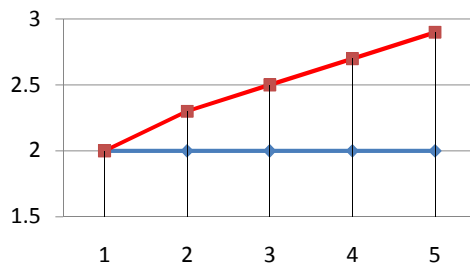
LP theory predicts ...

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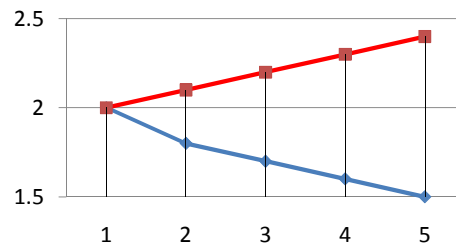
The LP theory predicts that the slope tends to be **POSITIVELY BIASED**.

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When the expectations theory predicts a flat yield curve, LP theory predicts an upward-sloping one.

Even when the expectations theory predicts a downward-sloping yield curve, LP theory can still predict an upward-sloping one.



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Liquidity Premium Theory and the FACTS

Explains the Fact 1 & 2;

the theory's prediction is basically equal to the expectations theory's, except for the positive bias for the slopes of yield curves.

Also explains the Fact 3;

the theory predicts an upward-sloping yield curve, except when short-term yields are expected to decline very sharply in the future.

The LP theory explains consistently all of the empirical facts about the pattern of yield curves!

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