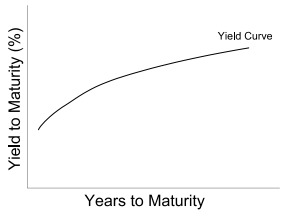
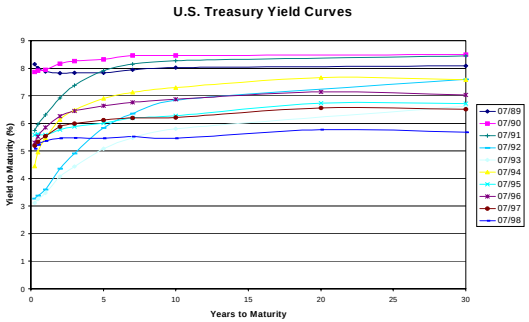
Term Structure of Interest Rates

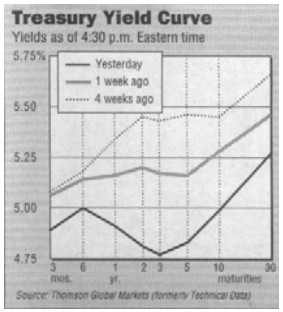
Definition
Relationship between yield (market interest rate) and maturity for a specific type of bond ("Yield Curve")

In constant motion [click], but normally slopes upward



Issue
Does the shape of the Yield Curve mean anything?





Term Structure Theories

Market Segmentation
No: Long- and short-term rates not related; slope reflects only relative supply/demand for each type of bond. Yield Curve an optical illusion

Why: Maturity clienteles exist on both sides of market

(Pure or Unbiased) Expectations
Yes: Long-term rates *averages* of short-term rates over same horizon (thus contain forecast of future interest rates)

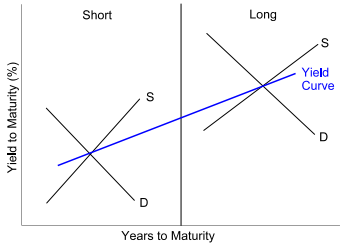
Why: Borrowers/Lenders want best rate

Liquidity Preference
Yes: Long-term rates are averages of short-term rates plus *term premium* (MRP).

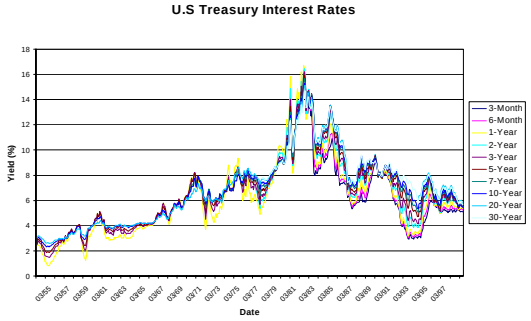
Why: Lenders prefer short-term bonds (less price risk, greater liquidity); accept lower rate
Borrowers prefer long-term bonds (repayment less immanent); pay higher rate

Market Segmentation

If the markets for long-term and short-term bonds are not related . . .



then why do they move together so closely?



Pure Expectations: Example

Opportunities

Rate on	Observed Now	Expected in 1 Year
1-Year Loan/CD	6.00%	10.00%
2-Year Loan/CD	9.00%	

Cash Flows

	0	1	2
Short	(1,000)	1,060	1,166
Long	(1,000)	1,090	1,188

Strategy
Borrow where payoff lowest
Lend where payoff highest

Result
Rates converge until payoffs equalized (and 2-year rate is average of 1-year rates)

Pure Expectations: Equilibrium

Opportunities

Rate on	Observed Now	Expected in 1 Year
1-Year Loan/CD	8.00%	10.00%
2-Year Loan/CD	9.00%	

Cash Flows

	0	1	2
Short	(1,000)	1,080	1,188
Long	(1,000)	1,090	1,188

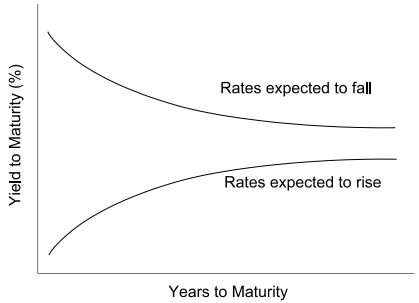
Strategy
Maturity irrelevant

Relationship
2-Year Rate is Average of the Two 1-Year Rates: $k_2 \approx \frac{k_1 + \hat{k}_1}{2} = \frac{8\% + 10\%}{2} = 9\%$

Pure Expectations: Forecasting

If long-term rate is average of short-term rates:
- observe long-term rate and current short-term rate
- infer unobserved (expected) future short-term rate

If Yield Curve:	Rates are Expected to:
slopes up	rise
is flat	remain unchanged
slopes down	fall



Liquidity Preference

If borrowers and lenders are *risk averse*, payoffs will *not* be equalized, because long-term rate includes risk premium, in addition to average of short-term rates:

$$k_2 \approx \frac{k_1 + \hat{k}_1}{2} + MRP$$

In order to forecast interest rate, first subtract unobserved MRP from observed yields