EXPECTATIONS AND MACROECONOMICS

The IS-LM model involves strategic "cheating".

Why? Because most of the components - consumption, investment, etc. - really involve decisions *over time*. Yet the model is "static" - it treats current decisions as a function only of current variables.

That's OK - you have to simplify. But also necessary to look at the role of the future in economic decisions - of expectations.

Good place to start: interest rates.

PRESENT VALUES

1. What is $1 a year from now worth? I could lend out
$1/(1+i)$, where i is the interest rate, and have $1 a year from
now. So $1 next year is equivalent to $1/(1+i)$ now.

Or: the *present value* of $1 one year from now is $1/(1+i)$

2. Suppose you have a *stream* of payments coming in (or going
out): V_0 now, V_1 a year from now, V_2 two years from now, etc.

And suppose you knew interest rates from now to 1 year from
now, 1 year to 2 years from now, etc.

Then *present value* of that stream of payments would be

$$PV = V_0 + \frac{V_1}{1+i_1} + \frac{V_2}{(1+i_1)(1+i_2)} + \ ...$$

3. Special case: permanent payment of V each period, constant i:

$$PV = \frac{V}{1+i} + \frac{V}{(1+i)^2} + \ ... \ = \frac{V}{i}$$

TERM STRUCTURE OF INTEREST RATES

A typical bond pays a "coupon" c each year, plus repayment of principal n years from now. Price is expected present value of that income stream. *Yield* is that interest rate at which

$$P = \frac{c}{1+i} + \frac{c}{(1+i)^2} + \ldots + \frac{1}{(1+i)^n}$$

Yields vary among maturities. If the yield on long-term bonds is lower than on short-term, the market is in effect predicting that interest rates will fall. If it is higher, de facto prediction that rates will rise.

WHAT DETERMINES INVESTMENT?

Think of a project (e.g., building a shopping mall). Is it worth doing? There will be an initial cost (cost of building the mall), then a future stream of income from the project (rents from stores, minus expenses). *Calculate present value of expected income*. If it exceeds cost of building, go ahead. If not, don't do it.

So what affects investment:

1. Expected earnings from projects. Depends on expected state of the economy.

2. Current and expected future interest rates. (Or long-term rates corresponding to earnings stream)

Think V/i : State of economy affects V, financial conditions affect i.

Inflation and interest rates:

When overall level of prices increases, most things go up in tandem - including earnings on investments. Suppose you expected your shopping mall to yield V *real* dollars per year forever. If you now expect inflation at a rate π, then you should expect dollar income of $V(1+\pi)$ next year, $V(1+\pi)^2$ the year after, and so on.

So what's the present value of an investment that yields a real payoff V per year?

$$PV = \frac{V}{1+i} + \frac{V(1+\pi)}{(1+i)^2} + \ldots = \frac{V}{i-\pi}$$

i - π is the *real interest rate*