Economics 302 (Sec. 001) Intermediate Macroeconomic Theory and Policy (Spring 2012)

3/21/2012

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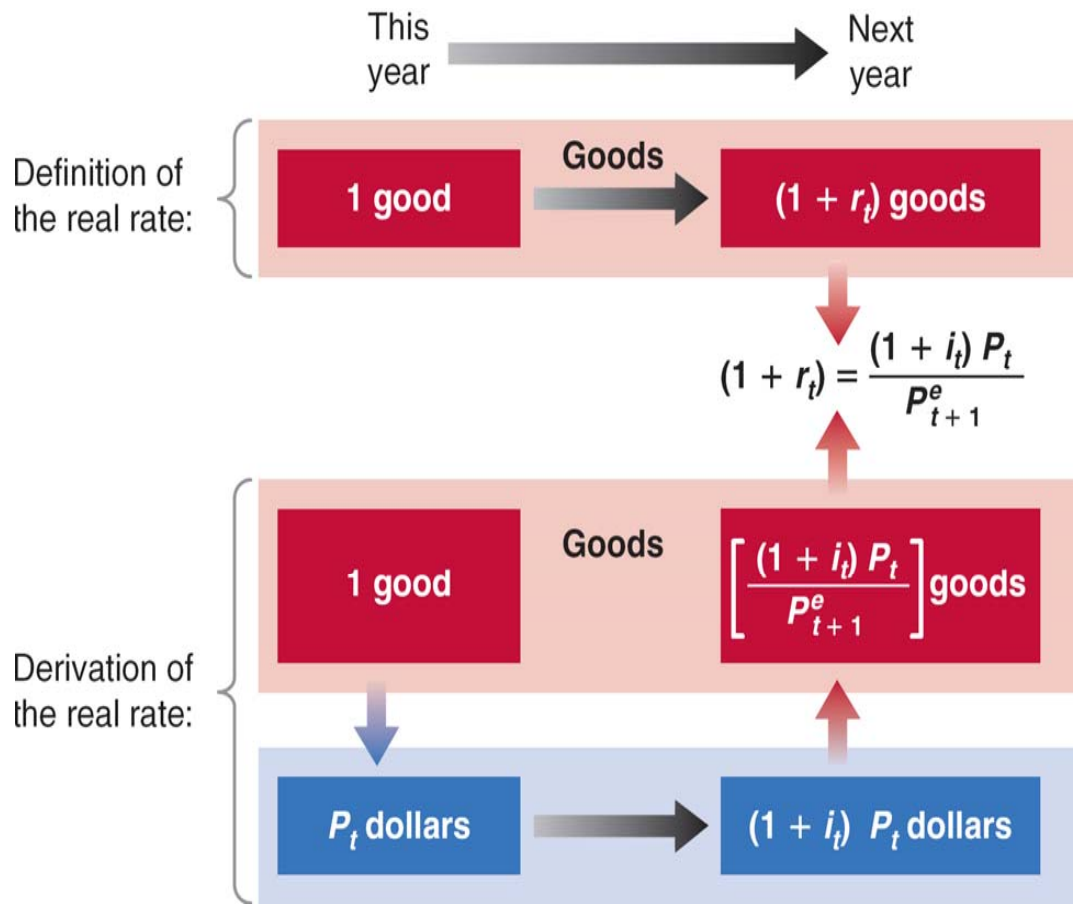
UW Madison

14-1 Nominal versus Real Interest Rates

- Interest Rates expressed in terms of dollars (or, more generally, in units of the national currency) are called nominal interest rates.
- Interest rates expressed *in terms of a basket of goods* are called real interest rates.

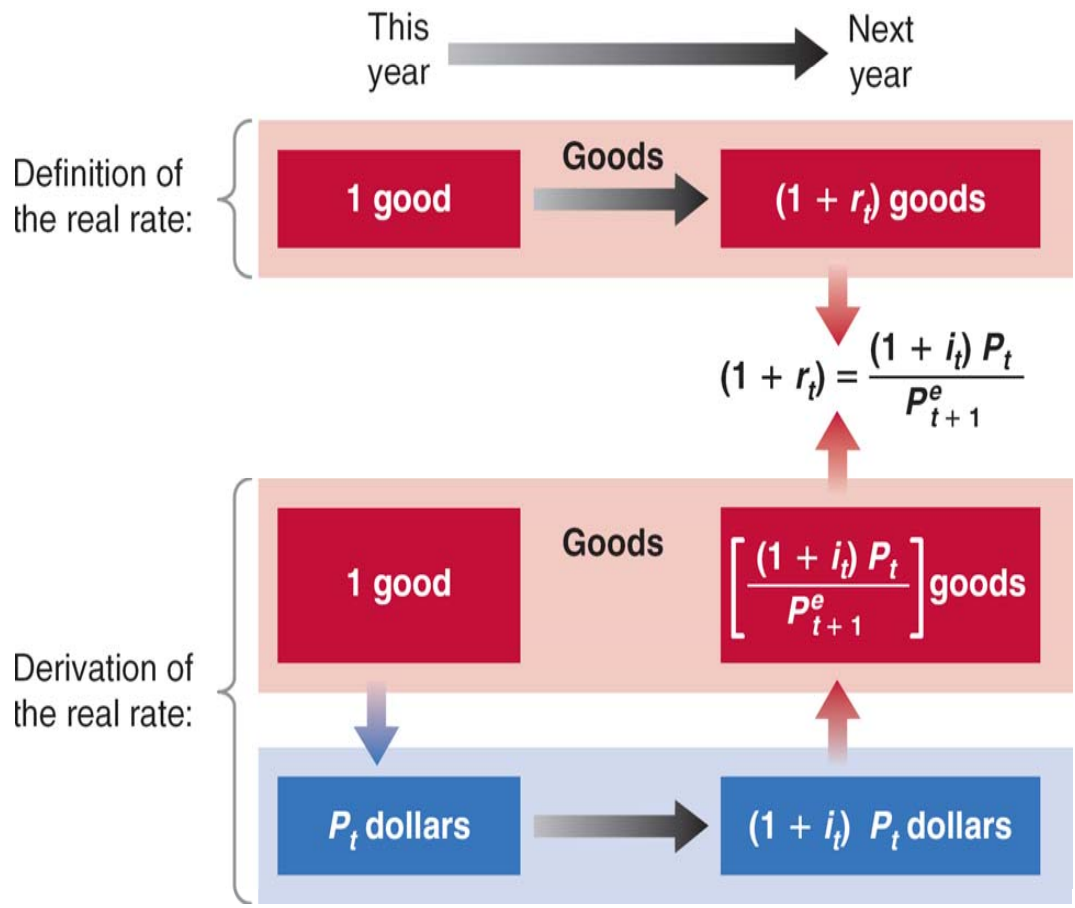


14-1 Nominal versus Real Interest Rates

Figure 14 - 1

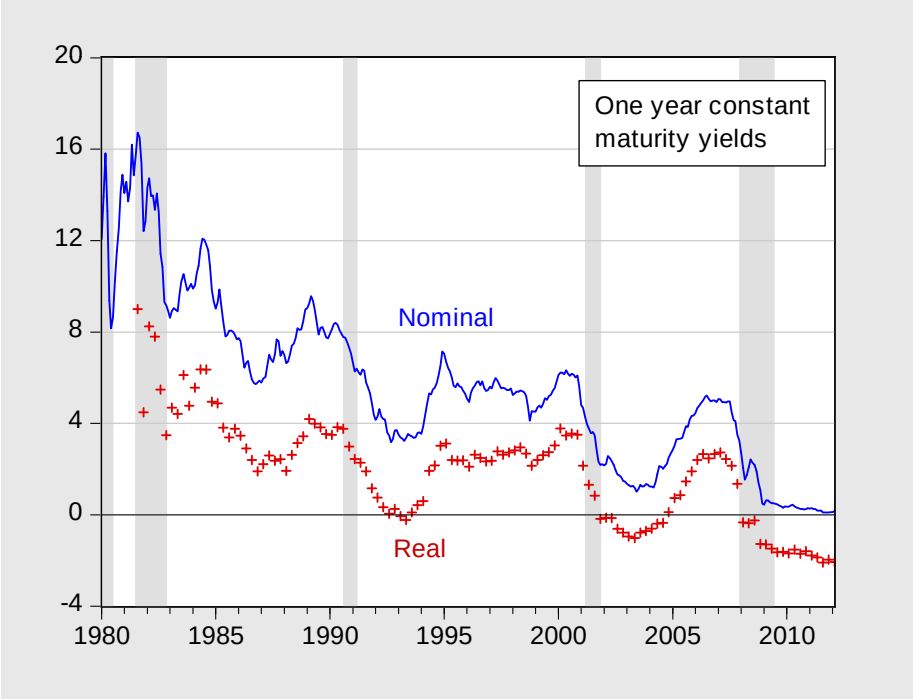
Definition and Derivation of the Real Interest Rate

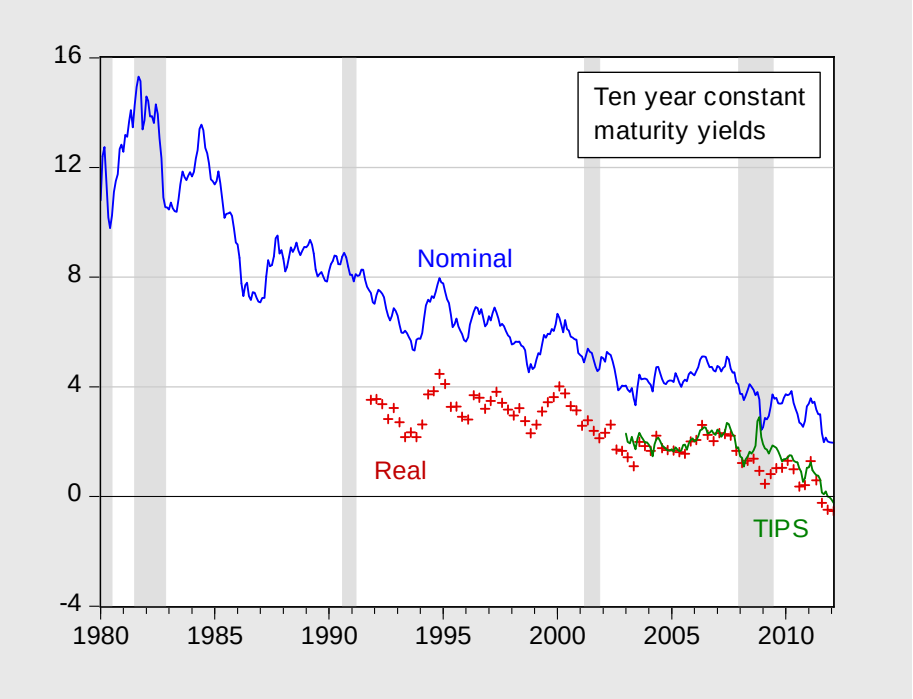
i_t = nominal interest rate for year t.
r_t = real interest rate for year t.
$(1+ i_t)$: Lending one dollar this year yields $(1+ i_t)$ dollars next year. Alternatively, borrowing one dollar this year implies paying back $(1+ i_t)$ dollars next year.
P_t = price this year.
P^e_{t+1}= expected price next year.



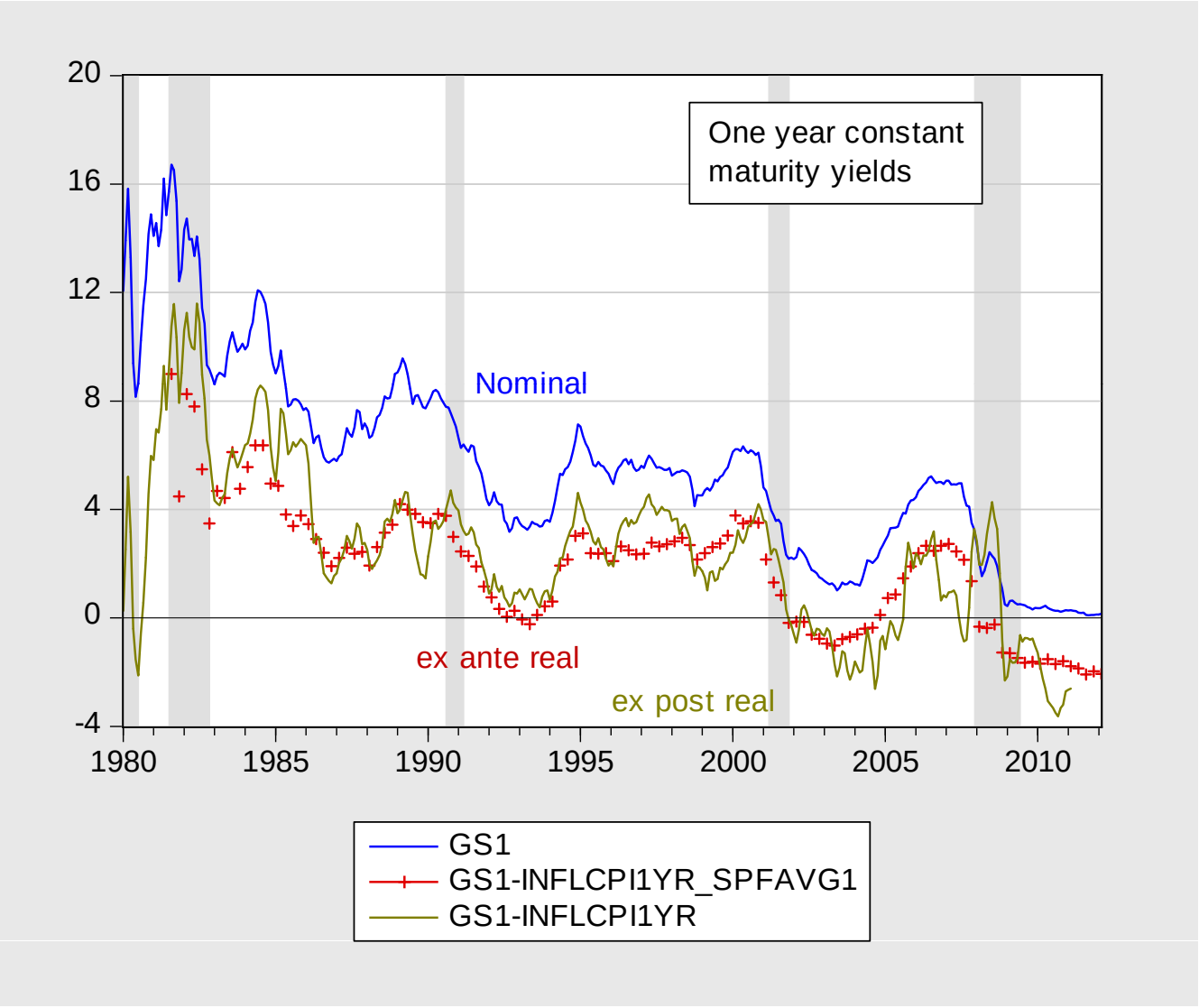
14-1 Nominal versus Real Interest Rates

Nominal and Real Interest Rates in the United States since 1980





Distinction between ex ante and ex post



$$r_t^{ex\_post} = i_t - \pi_{t+1} \qquad r_t = i_t - \pi_{t+1}^e$$

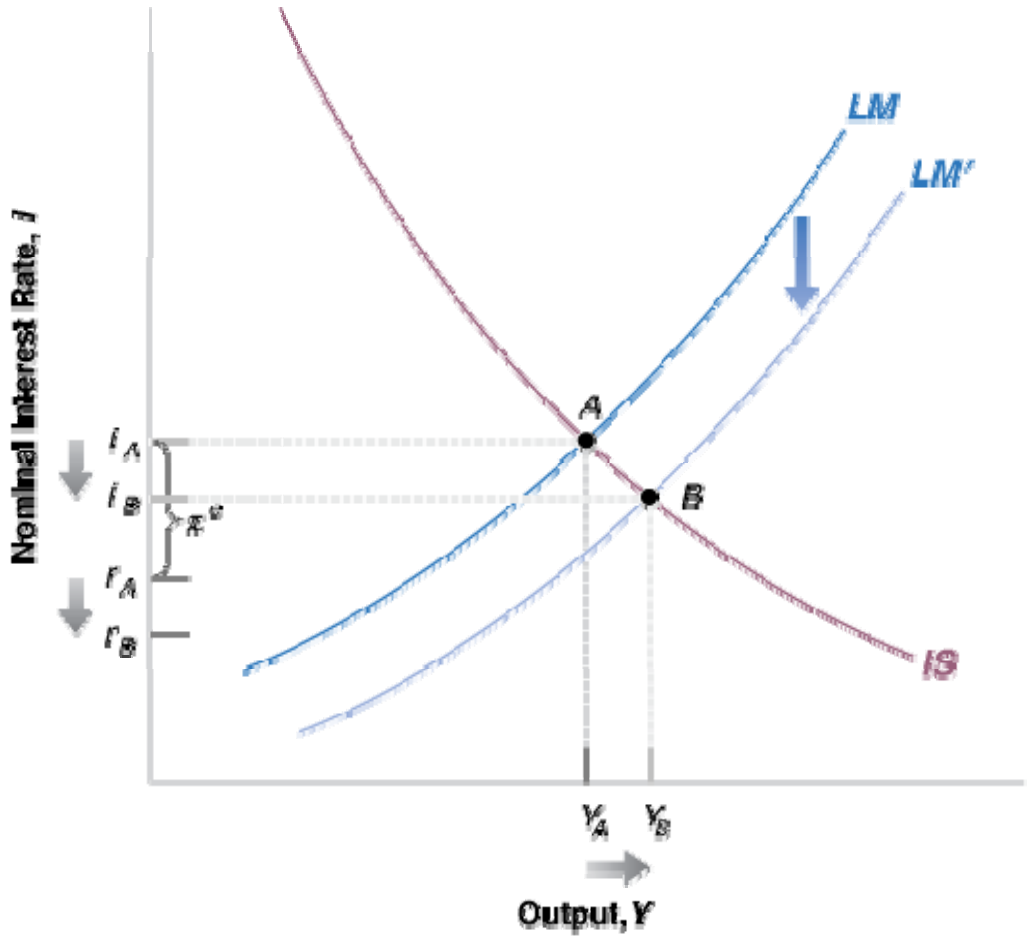
14-3 Money Growth, Inflation, and Nominal and Real Interest Rates

Nominal and Real Interest Rates in the Short Run

Figure 14 - 4

The Short-Run Effects of an Increase in Money Growth

An increase in money growth increases the real money stock in the short run. This increase in real money leads to an increase in output and decreases in both the nominal and real interest rates.



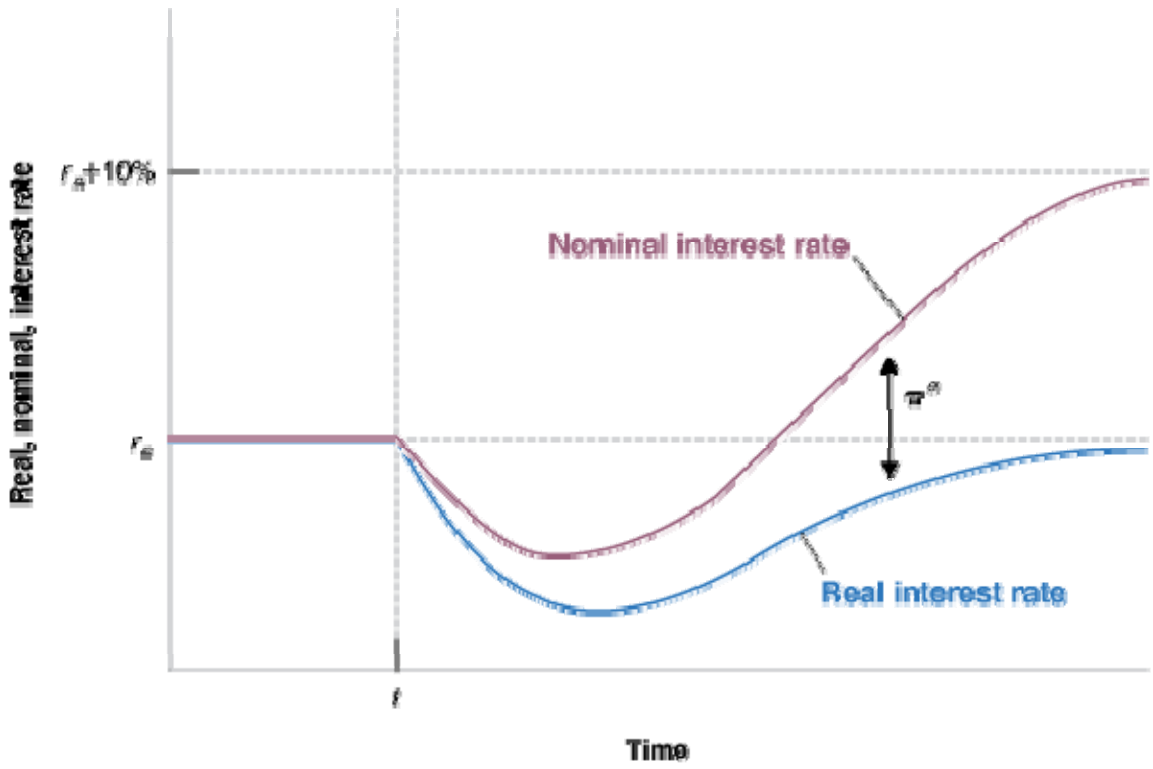
14-3 Money Growth, Inflation, and Nominal and Real Interest Rates

From the Short Run to the Medium Run

Figure 14 - 5

The Adjustment of the Real and the Nominal Interest Rates to an Increase in Money Growth

An increase in money growth leads initially to decreases in both the real and the nominal interest rates. Over time, however, the real interest rate returns to its initial value, and the nominal interest rate converges to a new higher value, equal to the initial value plus the increase in money growth.



Nominal Interest Rates and Inflation across Latin America in the Early 1990s

FOCUS

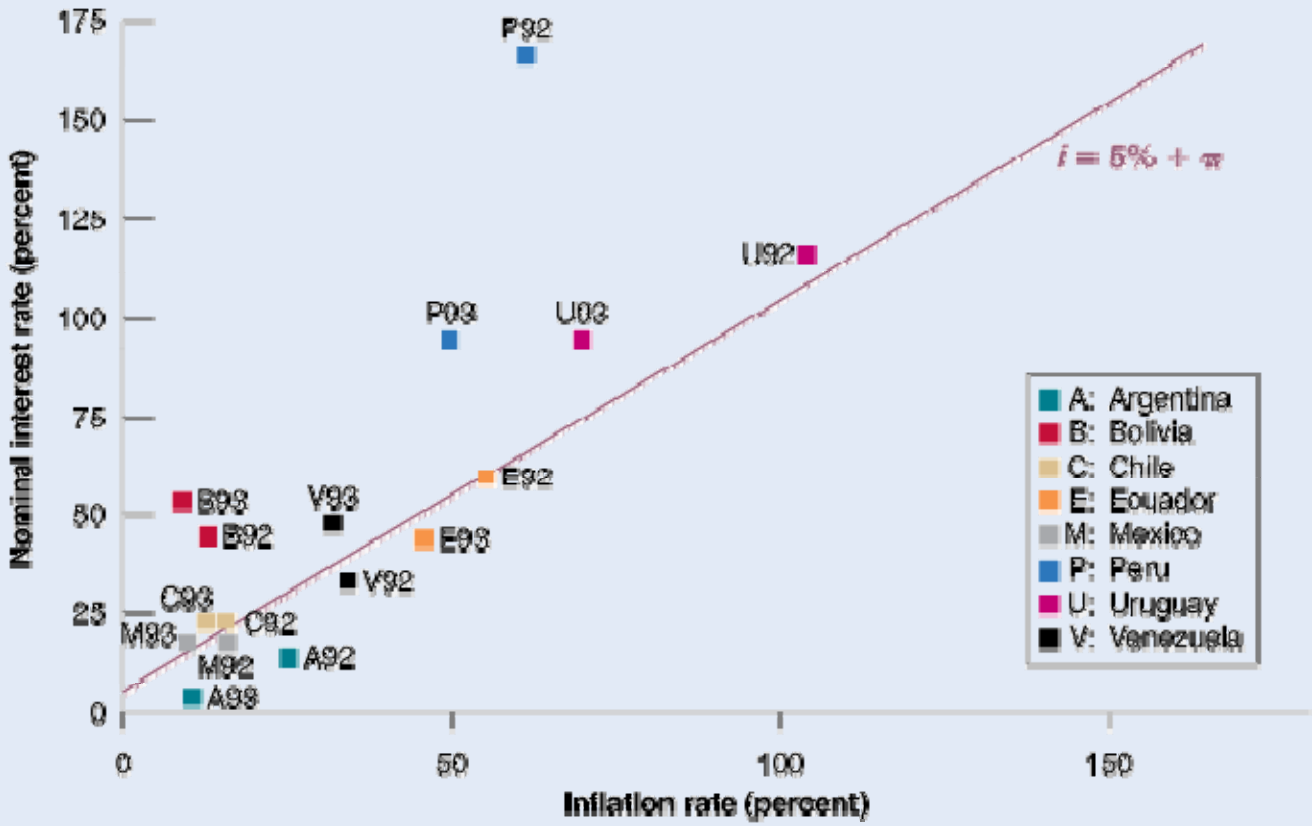


Figure 1 ***Nominal Interest Rates and Inflation in Latin America, 1992 to 1993***

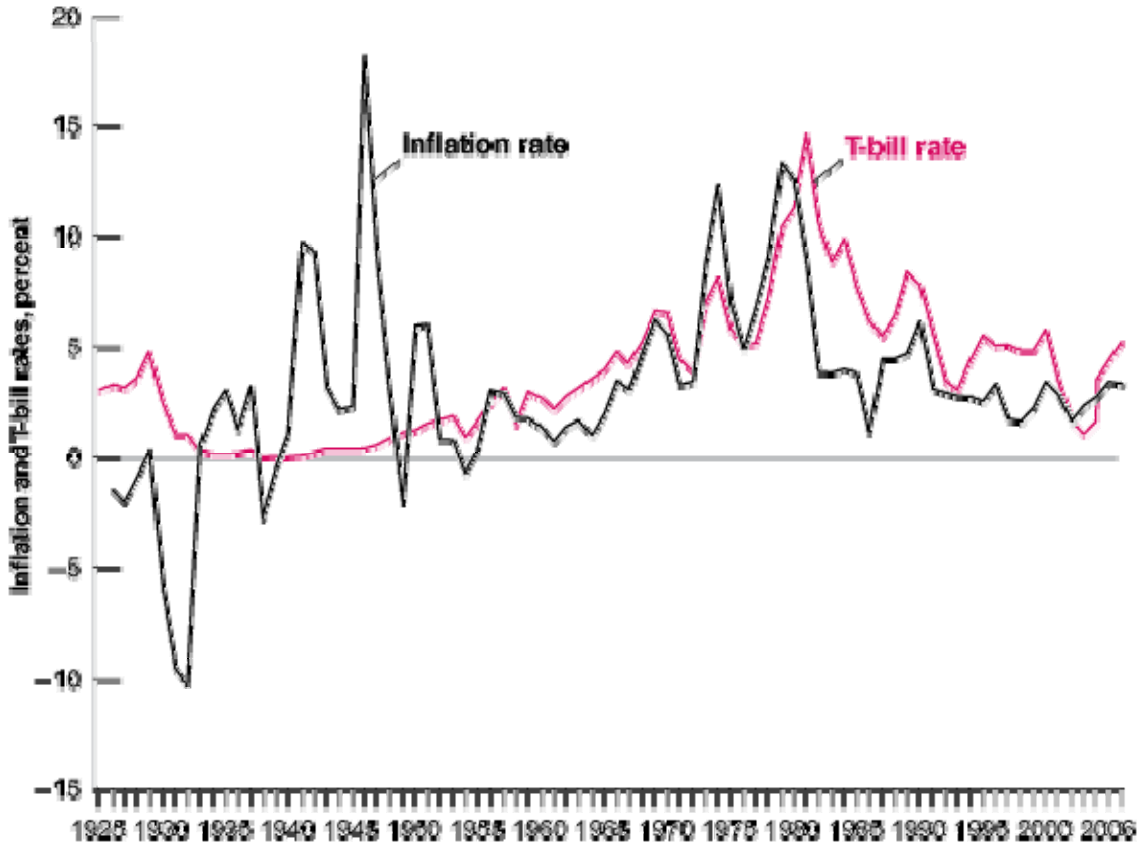
14-3 Money Growth, Inflation, and Nominal and Real Interest Rates

Evidence on the Fisher Hypothesis

Figure 14 - 6

The Three-Month Treasury Bill Rate and Inflation since 1927

The increase in inflation from the early 1960s to the early 1980s was associated with an increase in the nominal interest rate. The decrease in inflation since the mid-1980s has been associated with a decrease in the nominal interest rate.



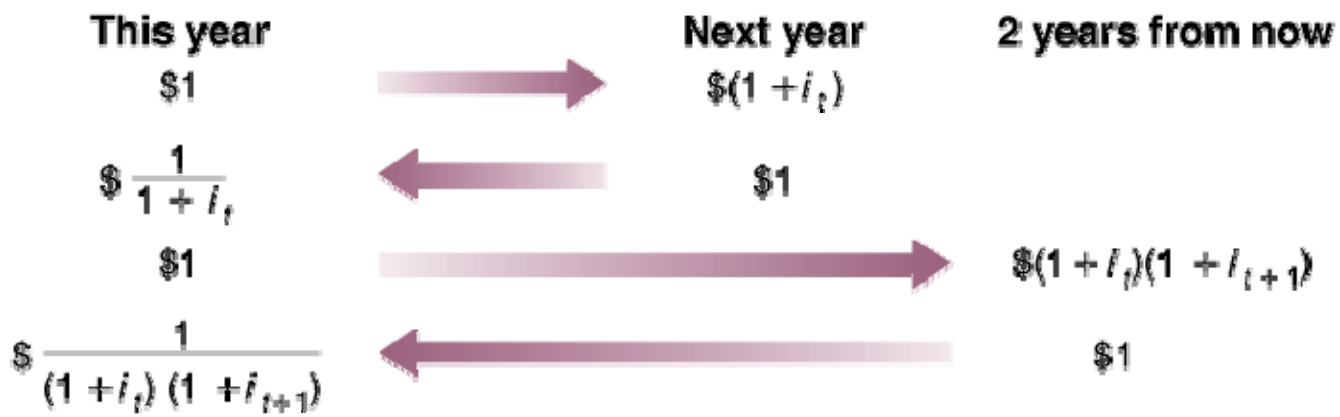
14-4 Expected Present Discounted Values Interest Rates

The **expected present discounted value** of a sequence of future payments is the value today of this expected sequence of payments.

Computing Expected Present Discounted Values

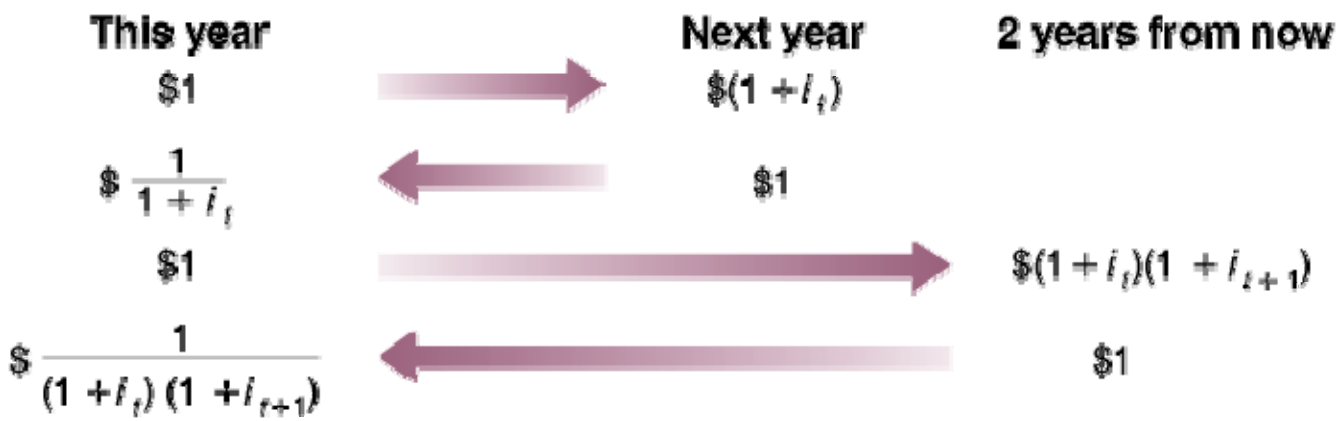
Figure 14 - 7

Computing Present Discounted Values



14-4 Expected Present Discounted Values Interest Rates

Computing Expected Present Discounted Values



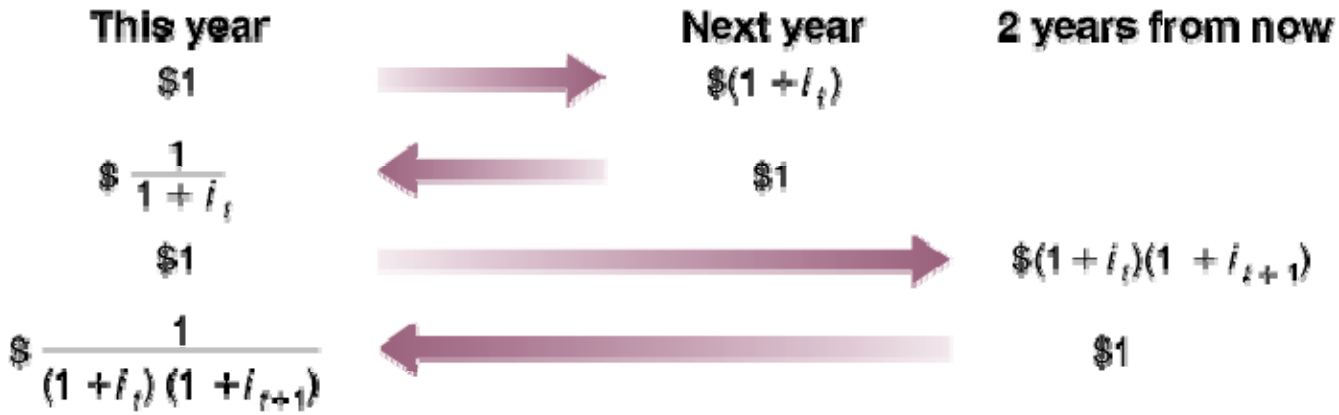
- (a) One dollar this year is worth $1+i_t$ dollars next year.
- (b) If you lend/borrow $1/(1+i_t)$ dollars this year, you will receive/repay $\frac{1}{(1+i_t}(1+i_t) = 1$ dollar next year.

(c) One dollar is worth $(1+i_t)(1+i_{t+1})$ dollars two years from now.

(d) The present discounted value of a dollar two years from today is equal to $\frac{1}{(1+i_t)(1+i_{t+1})}$

14-4 Expected Present Discounted Values Interest Rates

Computing Expected Present Discounted Values



The word "discounted" comes from the fact that the value next year is discounted, with $(1+i_t)$ being the discount factor. The 1-year nominal interest rate, i_t, is sometimes called the discount rate.