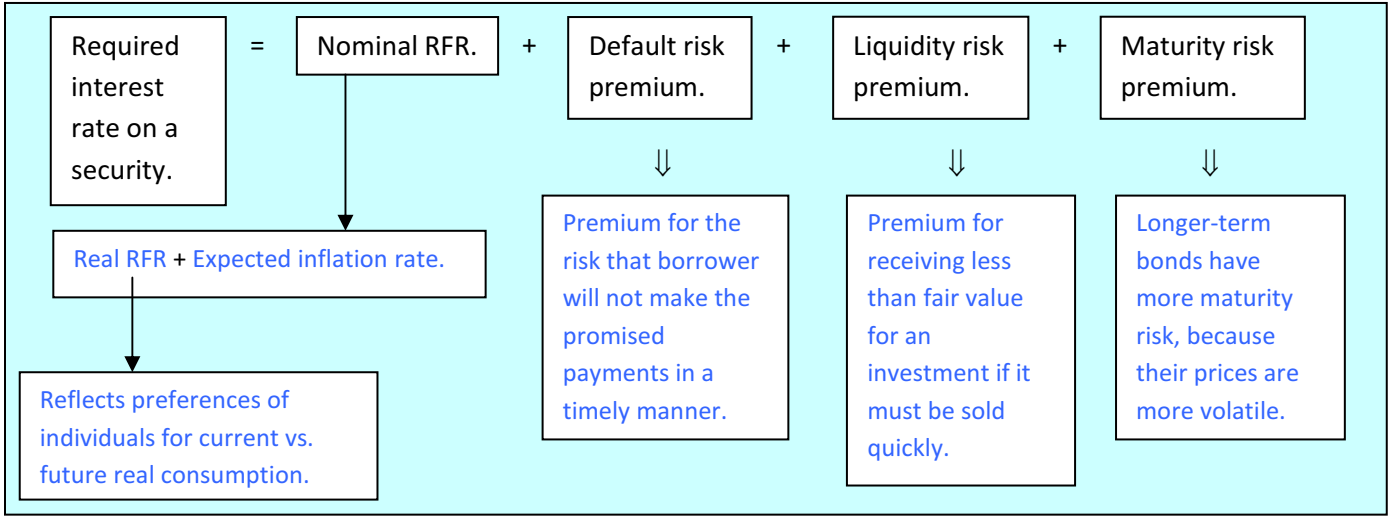


"THE TIME VALUE OF MONEY"

<p>Compound Interest or Interest on Interest</p> <p>Growth in the value of investment includes, interest earned on:</p> <ul style="list-style-type: none"> • Original principal. • Previous period's interest earnings. 	<p>Time Line</p> <p>Diagram of the cash flows associated with a TVM problem.</p>	<p>Discounting</p> <p>Moving CF to the beginning of an investment period to calculate PV.</p> $PV = \frac{FV}{(1 + i)^N}$ <p style="text-align: center;">$\frac{1}{(1 + i)^N}$ is PV factor</p>	<p>Compounding</p> <p>Moving cash flow to the end of the investment period to calculate FV.</p> $FV = PV (1 + i)^N$ <p>$(1+i)^N$ is FV factor</p>
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<p>Loan Amortization</p> <p>Process of paying off a loan with a series of periodic loan payments, whereby a portion of the outstanding loan amount is paid off, or amortized, with each payment.</p>	<p>Perpetuity</p> <ul style="list-style-type: none"> • Perpetual annuity. • Fixed payment at set intervals over an infinite time period. • $\frac{1}{r}$ is the discounting factor for perpetuity. 	<p>Annuity</p> <p>Stream of equal cash flows accruing at equal intervals.</p> <div style="text-align: center; margin: 10px 0;"> ↓ </div> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%; border: none; padding: 5px;">Annuity Due First cash flow occurs immediately.</td> <td style="width: 10%; border: none; text-align: center;">←</td> <td style="width: 10%; border: 1px solid black; text-align: center; padding: 5px;">Two types</td> <td style="width: 10%; border: none; text-align: center;">⇒</td> <td style="width: 30%; border: none; padding: 5px;">Ordinary Annuity First cash flow that occurs one period from now.</td> </tr> </table>	Annuity Due First cash flow occurs immediately.	←	Two types	⇒	Ordinary Annuity First cash flow that occurs one period from now.
Annuity Due First cash flow occurs immediately.	←	Two types	⇒	Ordinary Annuity First cash flow that occurs one period from now.			
<p>Cash flow Additivity Principle</p> <p>PV of any stream of cash flows equals the sum of PV of each cash flow as long cash flows are indexed at the same point in time.</p>	<p>PV of annuity due. > PV of ordinary annuity.</p>						

Interpretations of Interest Rate

- Required rate of return.
- Discount rate.
- Opportunity cost.

Effective Annual Rate (EAR)

- Rate of return actually being earned after adjustments have been made for different compounding periods.
- $EAR = (1 + \text{periodic rate})^m - 1$
- Stated rate will be equal to the actual (effective) rate only when it is compounded annually.