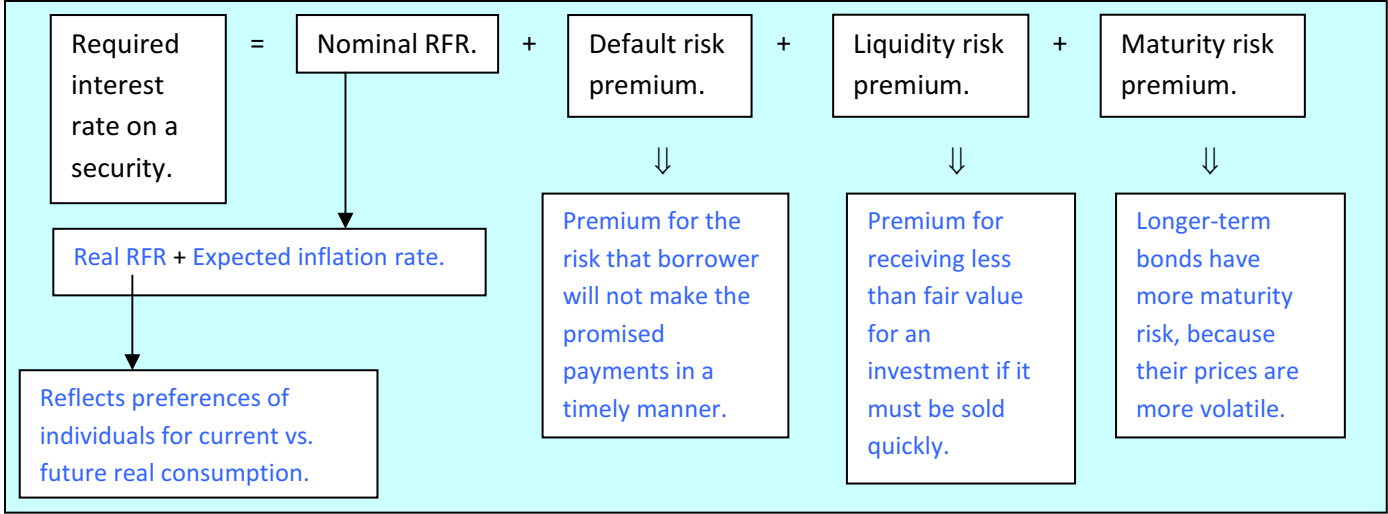


"THE TIME VALUE OF MONEY"

<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> <p style="text-align: center;">↓</p> <p style="text-align: center;">Two types</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Annuity Due</p> <p>First cash flow occurs immediately.</p> </div> <div style="font-size: 2em;">←</div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Two types</p> </div> <div style="font-size: 2em;">⇒</div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Ordinary Annuity</p> <p>First cash flow that occurs one period from now.</p> </div> </div>
<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.