1 Introduction to Interest

1.1 Working with Interest
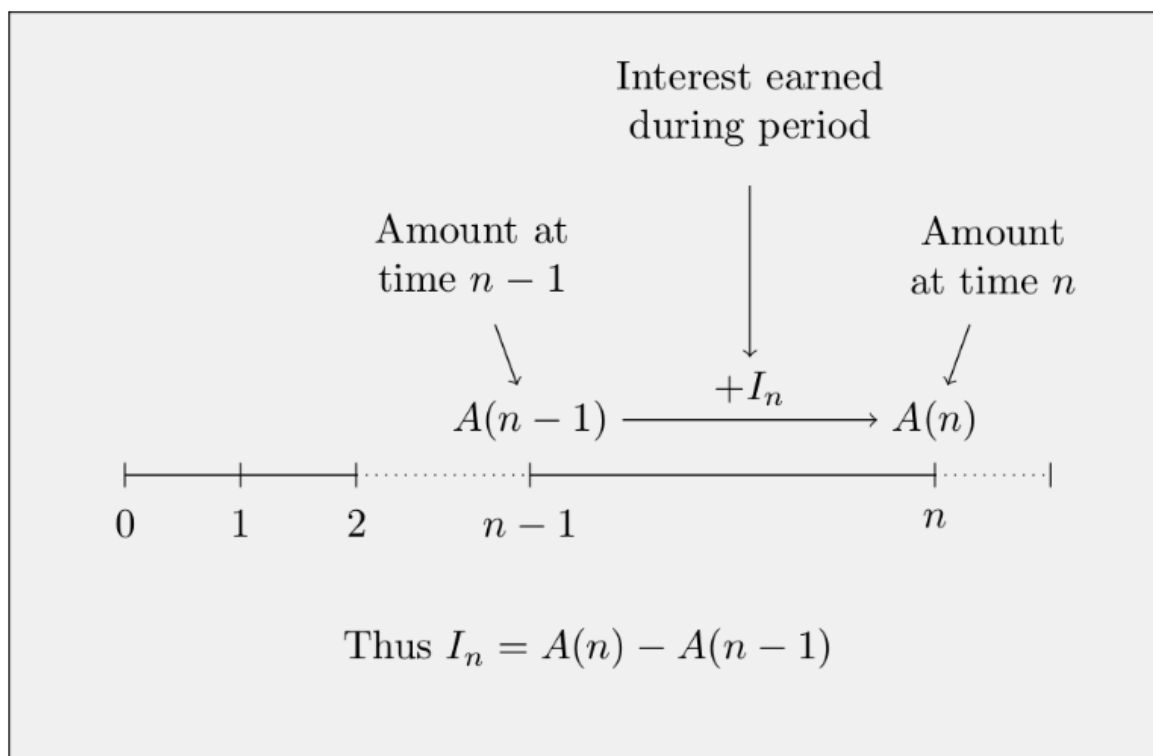

Figure 1: Calculating interest

> **Definition 1.1.1 (Effective Rate of Interest)**
>
> The effective rate of interest is the amount of interest earned (or paid) during the period divided by the initial principal amount, assuming the interest is received (or paid) at the end of the period.
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> ♣

⚠ **Warning**

Effective rates can be misleading since the time frame isn't considered.

Example.

Imagine you and I invest \$100 dollars. After 1 year my money has turned into \$110 dollars. After 3 years your money has also turned into \$110 dollars.

We both have an Definition 1.1.1

Generalizing this to the nth period between time $(n-1)$ and n, we have that i_n, which is the effective rate of interest earned over the nth period is given by:

$$i_n = \frac{A(n) - A(n-1)}{A(n-1)} = \frac{I_n}{A(n-1)} = \frac{\text{Interest}}{\text{Amount at the Start}}$$

1.2 Compound Interest

1.3 Nominal Rates of Interest

> **Definition 1.3.1 (Equivalent Rates)**
>
> Two rate are called **equivalent** if a given amount of principal invested for the same length of time at either rate produces the same accumulated values. ♣