Comparing interest rates

Need to Know

Effective interest rate formula:

\[ R_{ef} = \left( \frac{I_1}{P} \right) \times 100 \]

where \( R_{ef} \) = effective interest rate or real interest rate (p.a.) as a percentage
\( I_1 \) = amount of interest after the first year
\( P \) = principal

The effective interest rate is useful for comparing situations with different nominal rates and different compounding periods.

\[ R_{ef} = \left( 1 + \frac{R_{nom}}{n} \right)^n - 1 \times 100 \]

where \( R_{ef} \) = effective interest rate (p.a.) as a percentage
\( R \) = nominal interest rate as a decimal
\( n \) = number of compounding periods in 1 year

Worked Example 8

Find the effective rate of interest \((R_{ef})\) if \$25 000 is invested for 1 year at the following rates. Where necessary round your answers to three decimal places.

(a) a simple rate of 9.5% p.a.
(b) an annually compounding rate of 9.5% p.a.
(c) a monthly compounding rate of 9.5% p.a.
(d) a weekly compounding rate of 9.5% p.a.

Working

(a) \( R_{ef} = 9.5\% \) p.a.

For simple interest, the effective rate is the same as the nominal rate.

(b) \( R_{ef} = 9.5\% \) p.a.

For annual compounding, the effective rate is the same as the nominal rate.