

## Conditions

Riverside Bank offers to lend \$50K at a nominal rate of 6.5%, compounded monthly. The loan must be repaid at the end of the year. Midwest Bank also offers to lend you the \$50K, but it will charge an annual rate of 7.0%, with no interest due until the end of the year. How much higher or lower is the effective annual rate charged by Midwest versus the rate charged by Riverside?

## Solution

Here we must compare 2 cash flows.

The future value of money we must pay to Riverside Bank (RB) is:

$$50000\$ \cdot \left(1 + \frac{0.065}{12}\right)^{12} = 53348.6\$$$

The future value of money we must pay to Midwest Bank (MB) is:

$$50000\$ \cdot (1 + 0.07) = 53500\$$$

So, we can see, that RB is better to lend, than MB.

The effective annual rate could be found by using the following formula:

$$r = \left(1 + i/n\right)^n - 1$$

$$r_{RB} = \left(1 + \frac{0.065}{12}\right)^{12} - 1 = 0.06697$$

$$r_{MB} = 0.07$$

We can make a conclusion, that the effective annual rate of RB is lower than MB's on  $0.07 - 0.06697 = 0.00303$  (approximately 0.3%)