

Moving Backwards



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Money Later & Money Now

We have a debt of \$500 that will be paid in one year.
Someone offers to buy the debt from us today for \$450.
If the interest rate is 9%, is this a good offer?



Backwards in Time

We have a formula for travelling forward through time –

$$F = P(1 + r)^t$$

We can rearrange this to make a formula for travelling backwards through time –

$$P = \frac{F}{(1 + r)^t}$$



Our Example

If we will receive \$500 in one year, the present value is equal to:

$$P = \frac{\$500}{(1 + .09)^1} = \$458.72$$

The offer of \$450 is too low.



Harder Example



We owe the bank \$2.5 million in one year and another \$5 million in three years.

The interest rate is 12%

What is the present value of these two payments to the bank?

$$P = \frac{\$2.5}{(1 + .12)^1} + \frac{\$5}{(1 + .12)^3} = \$2.23 + \$3.56 = \$5.79 \text{ Million}$$



Takeaways

We revisited the notion that money at different moments has different values

We showed how to compute the present value of a payment received in the future



