

The Time Value of Money

The Time Value of Money (TVM) is a concept of which many people are unaware. Simply put, the TVM means today's dollars are worth more than future dollars. This is one of the reasons why notes with longer terms are discounted more than short-term notes. The reasoning behind the TVM is twofold.

The first reason is inflation. Inflation will drive the value of the dollar down over time. The same two dollars that will buy a loaf of bread today will not buy a loaf of bread ten years from now. Likewise, how many loaves of bread would two dollars have purchased twenty years ago?

The second reason is a sort of "lost opportunity" cost. Money currently tied up in an investment is unavailable for another investment. This is also affected by the length of time of the commitment. The example below will explain this further.

Let's look at a few examples using interest compounded monthly. We will calculate the value of \$1000 in ten years if we invest it at 5%:

<u>Investment</u>	<u>Interest</u>	<u>Time</u>	<u>Final Value</u>
\$1000	5%	10 years	\$1647.01

Using this example, we can reverse the calculation to discount for the TVM. If today someone was to offer to "sell" to you a one-time payment of \$1647.01 in ten years from now, and you feel that you should earn 5% on your money, then you would offer that person \$1000 today for that future payment. Now your \$1000 is unavailable to you for ten years while it is earning 5% interest. If someone was to offer you an investment opportunity at 12% interest, you no longer have that \$1000 to invest (hopefully you have other money available!).

Let's continue with the above scenario, but this time you know that you can make a 12% "yield" on your money elsewhere. Therefore, when you are offered the one-time future payment of \$1647.01, you know that to make it worth your while you need to make more than 12% on your money. For this investment, you want to make 15% on your money.

<u>Future Payment</u>	<u>Interest</u>	<u>Time</u>	<u>Value in "Today's" Dollars</u>
\$1647.01	15%	10 Years	\$370.93

That is quite a difference from the value of the future payment at 5%. This is the Time Value of Money at work, and is one of the reasons why notes are discounted when purchased by note investors. Investors target a desired "yield" when making an offer on notes, because they know that they can make that same yield (at relatively the same level

of risk) elsewhere. This yield is based on many different factors, but in general is based on the “perceived risk” of the investment (see article, [“Investor Requirements”](#)).

Now let’s look at a fully-amortizing note and discount a few individual monthly payments to see how the TVM increases the discount the farther into the future we go. For this example, we’ll say that we want to make 12% on our money.

<u>Face Value</u>	<u>Interest</u>	<u>Term</u>	<u>Monthly Payment</u>
\$150,000	6%	30 years	\$899.33

<u>Payment Number</u>	<u>Yield</u>	<u>Value in “Today’s” Dollars</u>
#60 (5 years)	12%	\$495.04
#120 (10 years)	12%	\$272.49
#240 (20 years)	12%	\$82.56
#360 (30 years)	12%	\$25.02

Here you can see how the TVM decreases the value of payments further as the length of time increases. A roughly \$900 payment thirty years into the future is worth only \$25 to someone who can make 12% on their money. This is why the discount is steeper on the long-term notes; the last few years of payments are so far into the future, the TVM reduces their value dramatically.

Using a different scenario, let’s take a payment stream of \$500 per month and compare the amounts offered for 15 years and for 30 years of payments at the same yield.

<u>Term</u>	<u>Yield</u>	<u>Monthly Payment</u>	<u>Value</u>
15 years	8%	\$500	\$52,320.30
30 years	8%	\$500	\$68,141.75
		A difference of:	\$15,821.45

You can see that doubling the amount of payments adds only about 30% to the value of the payment stream. This is because those particular payments do not begin for another 15 years, and the Time Value of Money discounts them much more than the first 15 years of monthly payments.

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