

Present Value

Mariah Carey deal. what were they thinking?

Calculate that deal

backwards loan calc usage

read mixerman diaries

The agent escrow account. book keeping

Homework

Future value calculation.....

FV of \$25,000 loan. 2 years. 8 percent annual interest. calculated monthly.

FV of \$25,000 loan. 2 years 8 percent interest calculated quarterly.

FV of \$1000 loan. 6 months. 25% annual interest calculated daily.

Generate a loan amortization table for a \$5000 loan. Annual interest 11%, Length of loan is 18 months and payments are monthly.
make a pdf, screen shot or other digital file. print it out or if you must email it to me.
due tuesday at 5:00 pm

8 percent annual interest monthly calculation

$$8/12\% = .00666666667$$

2 years in months = 24 months

$$FV = 25000(1 + .0067)^{24} = 29322.20$$

8 percent interest calculated quarterly
 $8\%/4 = .02$

2 years of quarters = 8 time periods

$$FV = 25000(1+.02)^8 = 29291.48$$

FV calculated more often is more!
FV calculated less often is less!

FV of \$1000 loan. 6 months. 25% annual interest calculated daily.

25% annual interest = 0.0006849 daily interest

6 months has 182.5 days

$$FV = 1000(1 + 0.0006849)^{182.5} = 1133.09$$

Assuming 365 days a year.

this is what your credit card is probably charging you

Amortization Calculator

Almost any data field on this form may be calculated. Enter the appropriate numbers in each slot, leaving blank (or zero) the value that you wish to determine, and then click "Calculate" to update the page.

Principal

Payments per Year

Annual Interest Rate

Number of Regular Payments

Balloon Payment

Payment Amount

Show Amortization Schedule

Calculate



This loan calculator is written and maintained by Bret Whissel.
See [Bret's Blog](#) for help, a spreadsheet, derivations, calculator news, and more information.

Summary

Principal borrowed: \$5,000.00
Regular Payment amount: \$302.59
Final Balloon Payment: \$0.05
Interest-only payment: \$45.83

Annual Payments: 12
Total Payments: 19 (1.58 years)
Annual interest rate: 11.00%
Periodic interest rate: 0.9167%

Pmt	Principal	Interest	Cum Prin	Cum Int	Prin Bal
1	256.76	45.83	256.76	45.83	4,743.24
2	259.11	43.48	515.87	89.31	4,484.13
3	261.49	41.10	777.36	130.41	4,222.64
4	263.88	38.71	1,041.24	169.12	3,958.76
5	266.30	36.29	1,307.54	205.41	3,692.46
6	268.74	33.85	1,576.28	239.26	3,423.72
7	271.21	31.38	1,847.49	270.64	3,152.51
8	273.69	28.90	2,121.18	299.54	2,878.82
9	276.20	26.39	2,397.38	325.93	2,602.62
10	278.73	23.86	2,676.11	349.79	2,323.89
11	281.29	21.30	2,957.40	371.09	2,042.60
12	283.87	18.72	3,241.27	389.81	1,758.73
13	286.47	16.12	3,527.74	405.93	1,472.26
14	289.09	13.50	3,816.83	419.43	1,183.17
15	291.74	10.85	4,108.57	430.28	891.43
16	294.42	8.17	4,402.99	438.45	597.01
17	297.12	5.47	4,700.11	443.92	299.89
18	299.84	2.75	4,999.95	446.67	0.05
19	*0.05	0.00	5,000.00	446.67	0.00

*The final payment has been adjusted to account for payments having been rounded to the nearest cent.

What is the present value of a lump sum of money in the future?

What is the present value of a stream of monthly payments (example pension, royalties etc) in the future?

Why would you need to know this?

Divorce! Any of you going in to family law or accounting will eventually encounter this problem.

Buying out a partner in a business.

Buying out a member of the band.

Value of a life insurance policy.

Getting an advance against royalties owed in the future?

Could be a simple calculation.

A record companies often hold half the royalties for possible "returns" from stores. For 2 years!. Suppose all those sales were downloads? E.G. no returns. The record company still by contract has the right to wait two years to pay. The artist might negotiate with the record company to get those royalties now. You would use some sort of present value calculation Or the sum would be *discounted*.

A divorcing spouse might ask NOW for his/her share of a lump sum in the future. Or the divorcing spouse may ask now for his/her share of a quarterly stream of royalty payments over the next 10 years.

A publishing company may wish to offer an advance for an established songwriters songwriting catalogue.

Remember this equation

$$FV = PV \cdot (1+i)^n$$

This implies

$$PV = FV / (1+i)^n$$

As usual

PV is present value

FV is Future value

i is the interest rate per period

and n is the number of periods.

What interest rate do we use?

Interest rate represents the market expectation of inflation + risk.

If we assume this amount is risk free the only thing the interest rate represents is expectations of inflation.

in this case use the interest rate for US treasuries for that period of time.

How do we find that...

To access interest rate data in the legacy XML format, click here.

Select type of Interest Rate Data

Daily Treasury Yield Curve Rates

Select Time Period

Current Month

Date	1 Mo	3 Mo	6 Mo	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
10/03/11	0.01	0.02	0.06	0.12	0.24	0.39	0.87	1.33	1.80	2.51	2.76
10/04/11	0.01	0.01	0.04	0.11	0.25	0.40	0.90	1.35	1.81	2.53	2.77
10/05/11	0.00	0.00	0.03	0.10	0.25	0.43	0.96	1.45	1.92	2.62	2.87
10/06/11	0.01	0.01	0.03	0.09	0.29	0.46	1.01	1.52	2.01	2.71	2.96
10/07/11	0.01	0.01	0.04	0.11	0.30	0.50	1.08	1.61	2.10	2.78	3.02
10/11/11	0.01	0.02	0.05	0.12	0.32	0.54	1.14	1.68	2.18	2.87	3.11
10/12/11	0.01	0.02	0.06	0.09	0.29	0.54	1.17	1.72	2.24	2.94	3.19
10/13/11	0.02	0.02	0.05	0.11	0.29	0.51	1.11	1.67	2.19	2.90	3.15
10/14/11	0.02	0.02	0.06	0.11	0.28	0.50	1.12	1.71	2.26	2.97	3.22

Friday Oct 14, 2011

* 30-year Treasury constant maturity series was discontinued on February 18, 2002 and reintroduced on February 9, 2006. From February 18, 2002 to February 8, 2006, Treasury published alternatives to a 30-year rate. See Long-Term Average Rate for more information.

Treasury discontinued the 20-year constant maturity series at the end of calendar year 1986 and reinstated that series on October 1, 1993. As a result, there are no 20-year rates available for the time period January 1, 1987 through September 30, 1993.

Treasury Yield Curve Rates. These rates are commonly referred to as "Constant Maturity Treasury" rates, or CMTs. Yields are interpolated by

Interest rates are artificially low. so these PV calculations are probably to high. If i were buying a future lumps sum of money I wouldn't value them this way.

absolutely risk free \$100,000 due 30 years from now.
we always calculate interest calculated annually
when we are calculating a lump sum.

treasury 30 year yield is 3.22% (per year)

$$PV = 100,000 / (1 + 0.0322)^{30} = 38644.20$$

Calculate PV of 5000 dollars (risk free) payable 10 years from now.
10 year treasury is %2.26

$$PV = 5000 / (1 + 0.0226)^{10} = 3998.64$$

France vs Greece

More risk results in those countries paying a lot higher interest rate than the expected rate based on inflation. There is more risk.

\$10,000 from the government of Greece due 10 years from now.
compare that to
\$10,000 from the government of France due 10 years from now.

Greece 10 year yield = 26.9%
French 10 year yield = 3.017%

$$PV = 10,000 / (1 + .269)^{10} = 923.38$$

$$PV = 10,000 / (1 + .0317)^{10} = 7319.23$$

NOTE! these are not bonds. bonds include quarterly interest. if these were bonds it'd have a different value. For instance a 10,000 euro bond issued by government of greece is currently valued by the markets at about \$2400. the interest payments make this a much more complicated present value calculation

As the interest rate increases PV decreases
As the interest rate decreases PV increases

also note

As the interest rate increases FV increases
AS the interest rate decreases FV decreases

Q.How do we calculate PV for an individual or entity?

There is no market to “price” their debt to suggest an interest rate.

A.We guess or estimate.

Example I’m gonna give you \$1000 dollars a year from now. But i’m known to sometimes not pay my debts. You guess there is a 1/4 chance of me not paying you. So to value this right now you would calculate PV using a interest rate of 25% + a little more to take into account inflation.

Or consider that David Barbe is gonna give you \$1000 a year from now. David is known to almost always pay his debts. you guess there is only a slight chance he will be unable to pay. Say 3%. To value this promise right now you would calculate PV using the interest rate of 3% + a little more to account for inflation.

PV of DB \$1000 > PV of DL \$1000

PV of stream of income

My BMI airplay royalty statements average about \$6000 a quarter.
How do i calculate the PV of the next 3 years of BMI statements?

Amortization Calculator

Almost any data field on this form may be calculated. Enter the value (or zero) the value that you wish to determine, and then click "Calculate".

Principal	Payments per Year
<input type="text"/>	<input type="text" value="4"/>
Annual Interest Rate	Number of Regular Payments
<input type="text" value="6.0000"/>	<input type="text" value="12"/>
Balloon Payment	Payment Amount
<input type="text"/>	<input type="text" value="6000"/>

Show Amortization Schedule

This loan calculator is written and maintained by Bret's Blog. See [Bret's Blog](#) for help, a spreadsheet, derivations.

Amortization Calculator

Almost any data field on this form may be calculated. Enter the value (or zero) the value that you wish to determine, and then click "Calculate".

Principal	Payments per Year
<input type="text" value="65445.03"/>	<input type="text" value="4"/>
Annual Interest Rate	Number of Regular Payments
<input type="text" value="6.0000"/>	<input type="text" value="12"/>
Balloon Payment	Payment Amount
<input type="text"/>	<input type="text" value="6000.00"/>

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Note that \$72,000 is total is paid. to \$65,445. this stream has been “discounted”.

How did i get 6%? i just guessed. i guessed that it's pretty likely to receive an average of \$6000 each quarter.

Also since this is music we are talking about, my BMI income is susceptible to positive Black Swans so this is actually likely to be undervalued.

*positive black swan? A song from my catalogue get's covered by some huge star? a song from my catalogue becomes the title song to a huge film.

Well actually that's not quite true. I treated my income as a stock and did a historical volatility analysis of it. But we'll save that for the graduate school version of this course.

This is simple way for someone buying my BMI royalties for 3 years to figure out what to offer me for that stream of income.

What if i you decided that their was a lot more variation or risk in that stream of inome. You would use a higher interest rate.

The first four Camper Van Beethoven Records generate an average of \$12,000 in royalties a year (to CVB). The licensing deal expires soon. Assume we don't want to release these ourselves. What is the PV of 5 years of \$12000 a year?

If I use 10% annual interest rate?

If I use 5%?

If I use 20%

Mariah Careys \$80,000,000 deal**

Principal: 80000000.00
Payments per Year: 4
Annual Interest Rate: 6.0000
Number of Regular Payments: 28
Balloon Payment:
Payment Amount: 3520086.12
 Show Amortization Schedule

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needs to generate 3.52 million a quarter plus cover all manufacture and distribution costs

of course typical record deal is usually not a lump sum. 7 years, 7 albums 7 advances. probably something like 15-20million upfront.

so average sales of about 350,000 albums a quarter. not impossible but pretty unreasonable.

Homework

PV of a risk free 2000 dollars paid to you 7 years from now.
you'll have to find 7 year us treasury rate or "yield"

PV of a stream of income. The income averages 4675 a quarter. 5 years.
use an interest rate of 10%. calculate again with an interest rate of 20%.
use the online mortgage calculator to do this.