

CREDIT

Types of Credit

1. Line of Credit – Revolving, equity, credit card
2. Short Term – Operating, 90-day
3. Intermediate – Cows, machinery, automobiles, 3 – 7 years
4. Long Term – Land, buildings, homes, 20 – 30 years

Types of Repayment Plans

1. Amortized – Equal payments each period, by far the most common type
2. Balloon – Amortized with early lump payoff
3. Discount – Interest paid immediately (bad news)

Credit Costs

1. Interest - %, fixed or variable
2. Points – one point is 1% of the amount borrowed, paid at closing
3. Initiation Fees
4. Processing Fees
5. Type of Loan
6. Amount Borrowed
7. Length of Loan
8. Prepayment Penalties
9. Refinancing
10. Income Taxes

Sources of Credit

1. Farm Credit Service
2. Commercial Banks
3. Farmers Home Administration
4. Dealers
5. Insurance Companies
6. Individuals
7. Small Business Administration

Optimizing Use of Credit

1. Shop for capital
2. Plan ahead
3. Negotiate terms
4. Use for needs, not wants
5. Do not get carried away; stay within plans and repayment ability
6. Do not use on highly depreciable items
7. Use where returns are high and probable
8. Use credit insurance to manage risk

AMORTIZING LOANS

Amortize – extinguish or retire debt

Tools

1. By hand – Use tables for payment
2. By spreadsheet: Loan.xls
3. By financial calculator, TI BA35 \$20, excellent and recommended

Principles

1. Repay the loan in equal payments
2. Payments include interest and principal
3. Interest is always paid first on prior balance
4. Anything paid beyond interest goes to reduce the debt (amount owed, principal)

Amortization Steps

1. Decide the number of payments per year and length of loan
2. Calculate the payment
3. For each period determine the interest
4. For each period determine the principal
5. For each period determine the balance

Amortization Example

Amount Borrowed	\$10,000
Rate of Interest (per year)	10%
Number of Years	4

Yr	Payment	Interest	Principal	Balance
1	3,155	1,000	2,155	7,845
2	3,155	785	2,370	5,475
3	3,155	548	2,607	2,868
4	3,155	287	2,868	0

Payment: Amount Borrowed x Factor (P→A) = \$10,000 x 0.31547 = \$3,155
Interest: Rate/(Periods/Year)/100 x Balance = 10/1/100 x \$10,000 = \$1,000
Principal: Payment – Interest = \$3,155 – 1,000 = \$2,155
Balance: Prior Balance – Principal = \$10,000 – 2,155 = \$7,843

Some other useful loan calculations

Find Amount Borrowed – given Payment, Interest, and Term
Payment x Factor (A→P) = \$3,155 x 3.1699 = \$10,000

Find Term or Rate of Interest – given amount Borrowed and Payment

Find Factor (P→F) in table body = Amount Borrowed/Payment = 0.31547
Read Rate of Interest or Year in Headings

Find Interest Paid During Year – given payment, prior and current balance

Principal for Year = Prior – Current Balance = \$7,843 – 5,475 = 2,370

Interest for Year = Year's payments – Principal = \$3,155 – 2,370 = \$785

Example Loan Payments

Loan 1: \$20,000 borrowed, repaid monthly, 10% annual, 15 yrs, 2 points
Payment = \$214.92/mo

Loan 2: \$20,000 borrowed, repaid annually, 9% annual, 20 yrs, 0 points
Payment = \$2,190.92/yr

Loan 3: \$20,000 borrowed, repaid monthly, 9.75% annual, 15 yrs, 3.5 points
Payment = \$211.87/mo

Techniques for Evaluating and Comparing Loans

1. By total interest and points paid

Periods x Payment + Points – Amount Borrowed

Loan 1: \$20,000 monthly, 10%, 15 yrs, 2 points
 $180 \times 214.92 + 400 - 20,000$
 $= 19,085.69 \checkmark$

Loan 2: \$20,000 annually, 9%, 20 years, no points
 $20 \times 2190.92 - 20,000$
 $= 23,818.59$

Loan 3: \$20,000 monthly, 9.75%, 15 years, 3.5 points
 $180 \times 211.87 + 700 - 20,000$
 $= 18,836.60$

2. By interest rate

Quick and dirty comparison of points and years

Effective interest = Interest + points/n

Loan 1: \$20,000 monthly, 10%, 15 yrs, 2 points

Loan 2: \$20,000 annually, 9%, 20 years, no points

Loan 3: \$20,000 monthly, 9.75%, 15 years, 3.5 points

For 15 years:

Loan 1: $10 + 2/15 = 10.13\%$

Loan 2: $9 + 0/20 = 9\%$ ✓

Loan 3: $9.75 + 3.5/15 = 9.98\%$

For 4 years:

Loan 1: $10 + 2/4 = 10.5\%$

Loan 2: $9 + 0/4 = 9\%$ ✓

Loan 3: $9.75 + 3.5/4 = 10.63\%$

Choosing points over interest by calculating break even number of years:

$$\text{Rate}_1 + \frac{\text{Pts}_1}{n} = \text{Rate}_2 + \frac{\text{Pts}_2}{n}$$

$$n = \frac{\text{Pts}_2 - \text{Pts}_1}{\text{Rate}_1 - \text{Rate}_2}$$

$$6 \text{ years} = \frac{3.5 - 2.0}{10 - 9.75}$$

In general:

Long time \Rightarrow Take points and lower interest

Short time \Rightarrow Forget the points

3. By Present Value of payments and points - most accurate

View it as a cash flow and calculate the PV of payments and Points
(Requires MARR, 6% here)

Steps:

1. Find the payments.
2. Calculate the PV of the payments at the MARR, not the loan rate.
3. Add the points (\$, already PV)
4. Smallest PV is the least cost loan

PV Loan 1:
 PV of 180 pmts of 214.92 @ 6%/yr = 25,469
 PV of 2 points = 400
 25,469 + 400 = 25,869 (total PV)

PV Loan 2: (Lowest PV, best deal)
 PV of 20 pmts of 2,190.92 @ 6%/yr = 25,130
 PV of no points = 0
 25,130 + 0 = 25,130 (total PV) ✓

PV Loan 3:
 PV of 180 pmts of 211.87 @ 6%/yr = 25,108
 PV of 3.5 points = 700
 25,108 + 700 = 25,808 (total PV)

Summary of Loan Comparisons

Comparison of 3 loans based on **total interest** + points paid

Principal	Interest	Term	Payments	Points	Int+Pts	Rank
20,000	10.00	180 mos	214.92 /mo	400	19,086	2
20,000	9.00	20 yrs	2,190.92 /yr	0	23,819	3
20,000	9.75	180 mos	211.87 /mo	700	18,837	1

Comparison of 3 loans based quick and dirty **interest %** + points/years

Principal	Interest	Term	Payments	Points/yr	Int+Pts/y	Rank
20,000	10.00	180 mos	214.92 /mo	2/15	10.13	3
20,000	9.00	20 yrs	2,190.92 /yr	0/20	9.00	1
20,000	9.75	180 mos	211.87 /mo	3.5/15	9.98	2

Comparison of 3 loans based on **PV of payments** + points **[Best Method]**

Principal	Interest	Term	Payments	Points	PV	Rank
20,000	10.00	180 mos	214.92 /mo	400	25,869	3
20,000	9.00	20 yrs	2,190.92 /yr	0	25,130	1
20,000	9.75	180 mos	211.87 /mo	700	25,808	2