CHAPTER 13

MANAGEMENT OF INDIVIDUAL LOANS

Learning Objectives

After studying this chapter, a student should be able to:

- ☑ Describe the financial covenants of the borrower
- ☑ Calculate interest adjustment payments
- ☑ Calculate full and partial mortgage loan prepayments
- ☑ Describe the valuation of mortgage investments
- ☑ Calculate final payments on fully amortized loans
- ☑ Explain arrears and default management

FINANCIAL COVENANTS OF THE BORROWER

Once a borrower and a lender have agreed to the terms of a mortgage, the mortgage contract must be drawn up. Prior to signing the contract, the mortgage lender will require a title search and survey on the property and a tax statement indicating the amount of arrears in property taxes and other levies (if any exist). The basic financial elements of the mortgage (i.e., loan amount, contractual term, size of payments, and interest rate) will be expressed in the statement of the financial relationship between the two parties.

The loan amount includes disbursements, insurance fees, and bonuses or brokerage fees. Further, the interest rate is expressed in accordance with the terms of the federal *Interest Act*. If the loan was "bonused" or if brokerage fees were charged, a disclosure form may also be required. In British Columbia, mortgage lenders and brokers must satisfy the requirements of the *Business Practices and Consumer Protection Act* (the BPCPA) by disclosing to the borrower the annual percentage rate (APR), which is the contractual interest rate plus any non-interest financial charges. The APR accounts for any bonuses or brokerage fees that may be charged on the loan, and ultimately reflects the "true cost of borrowing", net of any bonuses, brokerage fees, or other fees that may apply. Rates must be disclosed as an APR so that borrowers can easily compare the real rates on a variety of different loans.

There are three financial obligations of the borrower in addition to repayment of the loan amount, all concerned with protection of the value of the security, which are also covered by personal covenant: the payment of property

taxes, property insurance, and property maintenance. These are discussed in the following subsections.

Payment of Property Taxes

As all government taxes, levies, and assessments, whether or not they are registered, have priority over mortgages as charges against a property, lenders must ensure that payment of these levies does not fall into arrears during the period in which the mortgage agreement is in effect.

Many lenders make the property tax payments themselves out of tax accounts established by a requirement that borrowers include a portion of the annual taxes with their periodic payments. For monthly payments, therefore, the total payment will include the mortgage payment plus 1/12th of the annual taxes. These tax payments go into the tax account maintained by the lender, who then makes the property tax payments.[1] When annual taxes change, the amount paid to the lender will be adjusted accordingly. This procedure ensures that the taxes do not fall into arrears and relieves the borrower of the necessity of finding a lump sum to pay the taxes.

As the accounting for this tax payment procedure may require additional staff and organization, some lenders (particularly private ones) leave payment of taxes to the borrower. If it is the borrower's responsibility to pay the taxes directly, a covenant to do so must be included in the agreement, and the lender must check annually to see that this is observed. The lender may send a list of mortgaged properties to the appropriate municipality or taxing authority that will provide the information on tax payments and arrears for a small fee. Whenever the taxes fall into arrears, the lender may have to pay the taxes, adding the amount to the mortgaged principal, to avoid the government exercising its right of tax sale to collect the arrears.

Tax Deferral

Upon receipt of the property tax notice, a property owner may be able to apply for a low-interest loan to pay the current year property taxes on their principal residence. There are two programs for property tax deferral: the regular program and the families with children program. Property owners can apply to defer a portion or all of the residential and some farm property taxes after the

home owner grant is deducted. If the application is approved, the province pays the current year unpaid property taxes on the property owner's behalf. The tax deferral arrangement appears on the title as a registered charge. Interest is calculated every month starting from the date that the property taxes are due or the date the property owner applied to defer, whichever is later. The property owner is charged simple interest on the taxes deferred. Interest rates are set every six months.

In the regular program, when a registered property owner is a Canadian citizen or permanent resident who has lived in British Columbia for at least one year, and is 55 years of age or over (only one spouse must be 55 or over), or a widow or widower, or a permanently disabled person as defined by regulation, they may apply to defer up to 100% of the net property taxes payable on their principal place of residence. The owner must also have a minimum equity of 25% in their home based on assessed values as determined by BC Assessment.

In the families with children program, a registered property owner that is a Canadian citizen or permanent resident who has lived in BC for at least one year and is financially supporting a child under certain circumstances, may apply to defer up to 100% of the net property taxes payable. The property owner must have a minimum equity of 15% of the property's assessed value and be financially supporting:

- any child who is under the age of 18 and living with them or who doesn't live at the property, but the property owner pays support for the child;
- their own child or stepchild of any age that is attending an educational institution (e.g., college or university);
- their own child or stepchild of any age who is designated as a person with disabilities under the *Employment and Assistance for Persons with Disabilities Act*; or
- their own child or stepchild of any age that, in the opinion of a physician, has a severe mental or physical impairment.

The tax deferral arrangement began in 1974 and the intention of the program is to permit eligible property owners to remain in their home without the immediate financial burden of real property taxes.

Property Insurance

The loan agreement should contain a covenant by the borrower to insure the property against fire and other specified hazards to the full insurable value of the security. The insurance should be in favour of the mortgage lender, with an endorsement to this effect on the actual policy so the insurer is aware of the lender's interest in the property. The requirement for proper insurance is occasionally overlooked by private lenders, greatly increasing their risk; the lender can potentially lose most of the invested capital.

The emphasis on insuring for full insurable value, rather than the amount of loan, is best explained by the following example:

Full Insurable Value	$240,000
Amount of Loan	$120,000

Assume the fire insurance coverage was equal to the amount of the loan ($120,000) and the borrower subsequently took out, from another company, another policy for the remaining $120,000 of insurable value payable solely to the borrower. Suppose fire damage of $100,000 occurred to the property. This amount would be shared between the two companies, the lender receiving only $50,000 under the first policy. If the borrower fails to apply the $50,000 paid by the second company to rectify the damage to the property, the outstanding balance on the mortgage may exceed the value of the property as security. If these circumstances lead to foreclosure, the lender may well come into possession of the property and must spend $50,000 to put the premises in saleable condition. To avoid such problems, the insurance policy in favour of the lender must be for the full insurable value of the property.

Property Maintenance

The borrower should be required to grant a covenant to maintain the property in a manner that will preserve the value of the security. This obligation is intended to reduce the capital risk in mortgage lending by attempting to ensure that the borrower does not cause or permit the value of the property to fall below the outstanding amount on the mortgage.

Other Provisions

The lender may require that the borrower accept certain other financial or financial-related obligations, depending upon the specific purpose of the loan, the source of income that is used to repay the debt, or the characteristics of the borrower and/or property. Most of these covenants deal with the legal (rather than financial) rights and responsibilities of the two parties. For example, certain clauses dealing with the maturity of the debt may be included. In addition to the clause where the debt automatically becomes due if the borrower sells the property, an *acceleration clause* likewise accelerates the maturity date, making both outstanding principal and accrued interest immediately due if the borrower defaults. The term of the loan, in the form of a call clause, is also in the agreement, as are any prepayment terms other than those specified in the federal *Interest Act*. In cases where the loan is given to finance the construction of improvements on the property, the amount of the loan is generally advanced incrementally, via progress payments based on the value of construction already completed. This ensures that the total amount advanced at any point in time never exceeds the difference between the final cost of the project and the cost of completing the project. The schedule by which this is to be done is generally listed in the mortgage agreement. Also, if collateral security is to be provided (e.g., savings bonds), the lender may wish to have the collateral agreement referenced in the mortgage contract.

acceleration clause
a condition on a contract that results in any accrued interest and outstanding principal being due in the case of default

Summary of Residential Mortgage Agreement Terms

The mortgage document is a contract signed only by the mortgagor (and guarantor, where applicable). It specifies, at the least, the following responsibilities for both parties:

- The Mortgagor Covenants to:
    - pay the debt and the accrued interest according to the method and schedule agreed upon by both parties
    - pay all taxes on the land and on the improvements

    - keep the property adequately insured in the name of the mortgagee
    - keep the premises in a reasonable state of repair
- The Mortgagee Covenants to:
    - leave the mortgagor in possession and to not interfere with the mortgagor's use and enjoyment so long as the covenants are maintained
    - execute the discharge of the mortgage upon repayment in full, thereby removing the charge against the interest in land given as security

The remaining financial covenants generally deal with the parties' remedies should these covenants not be honoured. The lender does not sign the agreement as the acceptance of the document binds the mortgagee to the terms of the contract. Immediately after the document is accepted, the mortgagee must ascertain that the charge against the property is properly registered. The process of borrower qualification ends with the signing of the agreement. From this step on, the mortgage lending process invokes the management of the mortgage investment.

LOAN ADMINISTRATION AND MANAGEMENT

Once an agreement has been reached between the lender and the borrower, mortgage lending focuses upon the management and administration of the individual mortgage investment. There are two aspects of this process.[2] The first aspect concerns the management and administrative procedures that occur when loan repayment proceeds in the fashion anticipated at the time the contract is initiated – prompt and orderly repayment of the loan over its contractual term. Included in this aspect are the administrative tasks of advancement of funds, the collection and reporting of payments, the payment of the outstanding balance at the end of the term, and, where applicable, the refinancing or *rollover* of the mortgage that may occur at the end of the contractual term on a partially amortized mortgage loan. Management decisions may relate to topics of partial or full prepayment that may be permitted during the contractual term and the potential for the assignment of

the borrower's responsibility if the property is sold during the term. A further topic in this context is the valuation and/or sale of the mortgage investment during the term.

rollover
practice where a borrower pays a nominal fee to the lender to postpone the maturity date of a loan

The second aspect deals with the mortgage lending process when orderly repayment does not occur. A great deal of skill and judgment is required to determine what action is required should default take place.

Advancing the Loan and Collection of Payments

Interest Adjustment on Advancement of Funds

The final step in the mortgage lending process takes place when the closing or transfer of title occurs and the mortgage funds are advanced to the borrower.

Regular monthly payments are generally required to be made on convenient dates, such as the 1st or 15th of each month. These regular payments include the full amount of interest for the preceding payment period and a repayment of a portion of the outstanding principal. However, the first regular payment does not usually fall exactly one period from the date of closing. For lenders to receive interest during the entire period for which the borrower has use of the funds, it is necessary to introduce an adjustment period. The *interest adjustment period* is the length of time between the date the funds are advanced and the beginning of the first payment period (which, in turn, is one period prior to the date on which the first payment is due).

interest adjustment period
the period of time between the date the funds are advanced and the beginning of the first payment period

The interest adjustment calculates the amount of interest owing on the funds advanced over the interest adjustment period. The interest adjustment amount is calculated by finding the amount of interest owing on the loan when interest is charged at the *daily interest rate* equivalent to the contract rate and when the number of compounding periods is equal to the number of days during the adjustment period. In essence, the interest adjustment is based upon the consideration of a mini-loan for the amount of the mortgage loan, which is

outstanding for the number of elapsed (or full) days during the interest adjustment period.

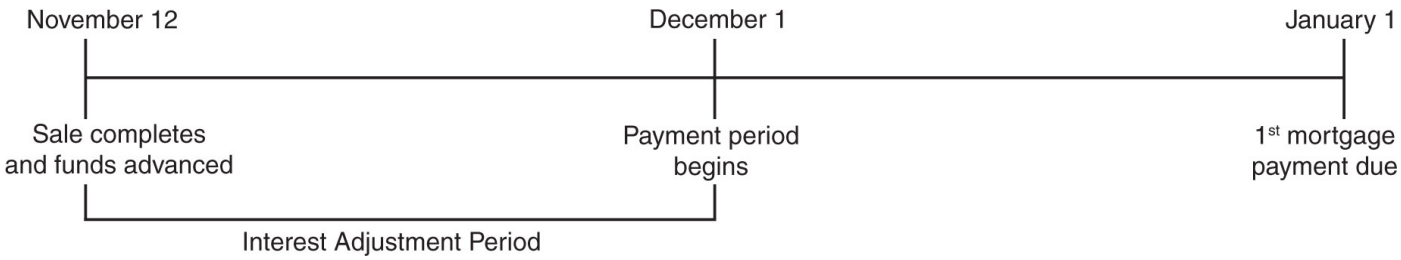
Because the loan will usually be stated as a nominal interest rate with semi-annual compounding (j_2) interest rate and the interest adjustment period is specified in days, an interest rate conversion is required – the j_2 rate must be converted to its j_{365} equivalent.

A simple way to calculate the number of days in an interest adjustment period is to use the following formula:[3]

	Number of days in the month in which the funds are advanced
–	Date on which the funds are advanced
+	Date in the next month on which the loan commences
	Number of days in the interest adjustment period

Illustration 13.1

Assume that a sale completes on November 12 and the payment period starts on the first of the month:



Solution:

Calculating the number of days in the interest adjustment period for the above illustration could be done as follows:

	30	days in the month of November
–	12	date in November when the funds are advanced
+	1	date in December on which the loan commences
	19	days in the interest adjustment period

Illustration 13.2

Consider the case of a $150,000 loan written at j_2 = 5.25% where payments are made on the first of each month with the first payment due on January 1, after

the first full month (December) of the contract. Funds are advanced on November 12.

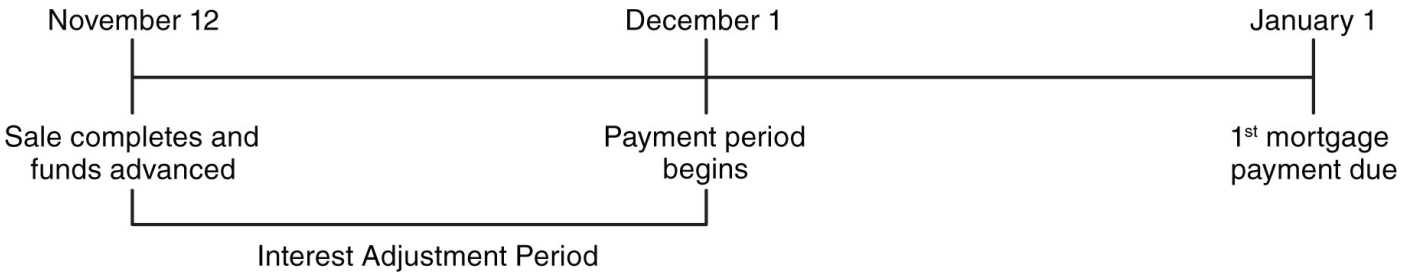
Determine the nominal interest rate per annum, compounded daily (j_{365}), that is equivalent to the contract rate on the mortgage. Given this daily rate, calculate the size of the necessary interest adjustment if:

a. the adjustment is made on December 1

b. if the adjustment is made on November 12

Solution:

To solve for the interest adjustment, determine the number of financial days, the equivalent nominal rate, compounded daily, and the interest adjustment under two options.



There are 20 calendar days from November 12 to December 1. However, the borrower only has use of funds for 19 full or elapsed days — that is, for 19 compounding periods (where each day represents one compounding period with daily interest rates). The rule-of-thumb in calculating interest adjustment periods is to count the first day of the period or the last day of the period but not both. For example, if you receive a loan at noon today and pay it back at noon tomorrow, that is one financial day, not two.

Alternatively, the number of days in the interest adjustment period can be calculated as done in Illustration 13.1. Next, determine the nominal interest rate per annum, compounded daily that is equivalent to the contract rate on the mortgage.

Calculation

Press	Display	Comments
5.25 ■ NOM%	5.25	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	5.318906	Equivalent effective annual rate
365 ■ P/YR	365	Enter desired compounding frequency
■ NOM%	5.182644	Compute equivalent j_{365} rate

The j_{365} rate equivalent to $j_2 = 5.25\%$ is $j_{365} = 5.182644\%$.

The lender requires that the borrower owe exactly $150,000 on the first day of December, which is the first day of the contract's term. However, this loan is advanced 19 days before the beginning of this time. The lender has two options:

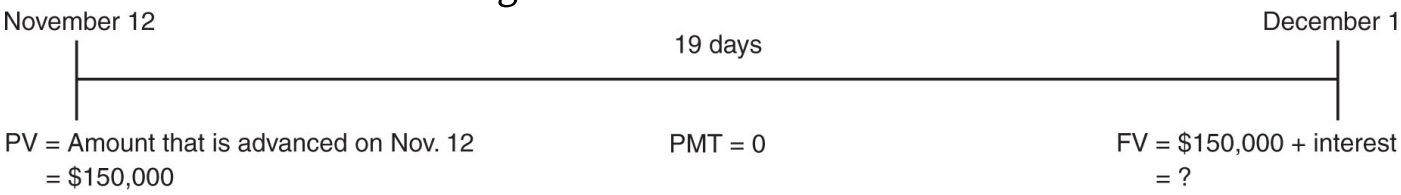
a. advance $150,000 on November 12 and ask the borrower to make a payment equal to 19 days' interest on this amount on December 1; or

b. advance an amount less than $150,000 on November 12 that, together with 19 days' interest, will result in the borrower owing exactly $150,000 on December 1.

From a financial perspective, these two approaches to interest adjustment are equivalent.

a. Advance $150,000 on November 12

Calculate total amount owing on December 1.



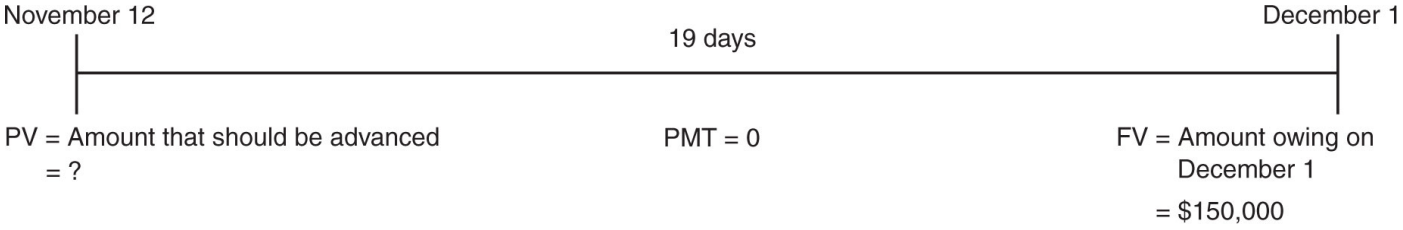
Calculation (continued)

Press	Display	Comments
	5.182644	j_{365} rate already stored
150000 PV	150,000	Amount advanced
0 PMT	0	No intervening payments
19 N	19	19 daily compounding periods
FV	–150,405.189775	Amount owing on December 1
+/– –150000 =	405.189775	Interest for 19 days

Since the borrower has agreed to pay back only $150,000 with the monthly payments, the borrower must make an interest adjustment payment of $405.19 on December 1.

b. Advance only enough that the borrower will owe exactly $150,000 on December 1

Alternatively, the borrower and lender may agree that the lender will advance a lesser amount on November 12 such that the borrower will owe exactly $150,000 on December 1.

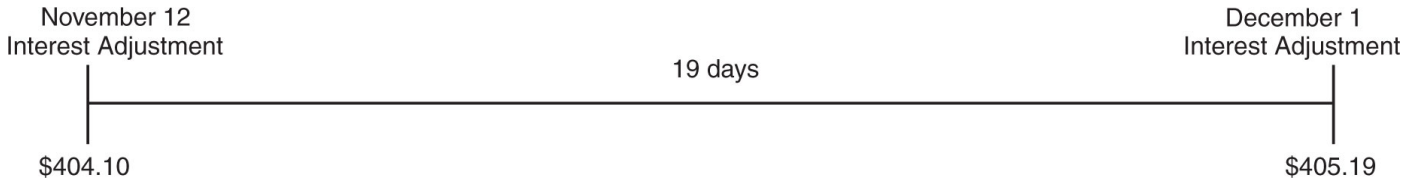


Calculation (continued)

Press	Display	Comments
	5.182644	j_{365} rate already stored
150000 +/– FV	–150,000	Amount owing on December 1
19 N	19	19 daily compounding periods
0 PMT	0	No intervening payments
PV	149,595.901801	Amount advanced
– 150000 =	–404.098199	Interest for 19 days

The lender will advance $149,959.90 on November 12; the $404.10 represents the interest adjustment to compensate the lender for advancing funds before the beginning of the amortization period of the loan.

To summarize, the lender could advance the entire loan amount early and be compensated for the borrower having the use of the funds for those 19 days, or the lender could advance less than the loan amount so that the money advanced accumulates interest over the adjustment period to equal the loan amount at the end. The interest rate charged is the same regardless of which method is used. While the two interest adjustment amounts are different, it is because they occur in different points in time:



Calculation (continued)

Press	Display	Comments
	5.182644	j_{365} rate already stored
404.1 PV	404.1	Interest adjustment November 12
19 N	19	Number of financial days
0 PMT	0	No intervening payments
FV	–405.191581	Interest adjustment November 1

Thus, the amount of interest adjustment at the end ($405.19) is equivalent to the future value of the amount of interest adjustment on December 1 ($404.10) compounded for 19 days at the contract rate of interest.

Payment Collection

Upon receipt of a regular mortgage payment, the lender determines the portion of the payment that is interest and the portion that is repayment of principal. The amount of principal repaid is subtracted from the last balance to give the new amount outstanding. In theory, if the payment is not made on the due date, in theory, daily interest on the amount of the payment should be charged. However, in practice, most lenders will not do this until the amount of interest involved exceeds some minimum (usually one dollar). To avoid this problem, many lenders require payment to be made by a series of pre-authorized debits.

Institutional lenders and well-organized private lenders have systems in place to handle the accounting for mortgage payments. If a private lender does not have a suitable accounting method, other formal procedures are available, such as:

- having payments made into a bank account. For a small charge, many banks will do the necessary calculations and issue the appropriate receipts. This service does not generally include the investigation and collection of arrears in payments.

- paying a trust company, mortgage broker, or real estate brokerage to look after the mortgages. These agencies will perform the accounting tasks, issue receipts, and take action on arrears in payments. This may involve not only the steps required to put the mortgage payments back in order but also the follow-through to foreclosure and sale, if necessary.

Management Decisions During the Loan Term

During the term of a loan, managerial decisions may be required. For example, while all covenants may be honoured, the borrower may want to prepay all or a part of the loan at some point during the contractual term. Alternatively, the borrower may want to sell the property and assign the borrower's responsibility to the purchaser. Both of these situations will require evaluation by the lender.

Further, the lender may wish to sell the loan to another investor. In this case the book and market value of the loan will be determined prior to attempting to market the mortgage. Once an offer is received, the lender will want to determine the yield that would result from the sale.

Prepayment on Mortgage Loans

Individual borrowers have the right, under the terms of the *Interest Act*, to prepay all the outstanding debt (with an additional three months' interest as a penalty in lieu of notice) at any time after five years from the initiation date of the mortgage for a mortgage with a term of at least five years. This right to prepayment extends only to individuals, not to companies. Therefore, the borrower can refinance at any time after the fifth year and would be particularly likely to do so in times of falling interest rates. In cases of rising rates, the lender has no comparable option because the lender has no right to ask for full repayment of the mortgage before the contractual date. However, most mortgages are usually for a term of five years or less; therefore, this prepayment option seldom comes into effect.

Historically, there was generally a market difference in attitudes toward prepayment between institutional and private lenders. In situations such as the one described previously, institutional lenders tended to discourage prepayment. The administrative cost of initiating new investments, combined with an inability to take advantage of favourable interest rate changes

accounted for this. However, this attitude has changed somewhat as lenders introduced new forms of loan repayment, most notably the partially amortized mortgage and the variable rate mortgage.

Mortgages are often distinguished by whether or not they can be prepaid without penalty. If a borrower arranges a mortgage that can be repaid in part or full during the term without any penalty, this is called an open mortgage or a pre-payable mortgage. In contrast, a closed mortgage is one in which the borrower cannot repay the outstanding balance during the term, and if the lender allows repayment, it is subject to a penalty. An open mortgage has a contract rate that is higher than an equivalent closed mortgage.

In the past, lenders were very strict about any form of repayment during the term of a closed mortgage, such that a mortgage term was locked in for the duration of the term and the borrower was unable to pay any extra down on the principal. However, in recent years, due in large part to increasing competition in the mortgage market, it has become standard practice for a lender to allow limited prepayment privileges for borrowers, such as increasing payments by up to 20% per year, doubling up payments periodically during the year, and/or paying off up to 20% of the outstanding balance owing on the loan.

Partial Prepayment

Many mortgage contracts make provision for partial prepayments by requiring or accepting extra (or balloon) principal repayment in addition to the amortization payments. Such payments distort the annuity relationship used in mortgage calculators and, consequently, adjustments to the mortgage must be made. If an extraordinary principal payment is made on the due date of a regular payment, the outstanding balance is decreased by the amount of the additional payment.

Two options are available to recognize the lessened indebtedness: the size of the remaining periodic payments may be reduced accordingly or, more commonly, the remaining amortization period may be shortened. With the preponderance of partially amortized loans, the net effect of electing the latter option is to reduce the balance owing at maturity, i.e., the end of the term of the loan. In some instances, mortgage contracts allow for partial (or complete) prepayment to occur at any point in the contractual term. Where such prepayments occur on dates other than the end of compounding periods,

adjustments must be made using equivalent rates and discounting. These applications are demonstrated in Illustration 13.3.

Illustration 13.3

A commercial borrower has arranged financing with the following terms:

Loan Amount:	$375,000
Contract Rate:	6% per annum, compounded semi-annually
Amortization:	25 years
Term:	10 years
Payments:	Monthly, rounded to the next higher $10

The mortgage allows for additional payments of principal at any point in the term, at the borrower's option, without penalty or notice. The borrower made all periodic payments as due and, in addition, made extraordinary principal payments of $10,000 at the end of the third and the seventh years. Calculate the balance due at the end of the contractual term.

Solution:

Method One: Point in Time

In the point in time method, first find the future amount owed on the loan under the regular payment scheme, i.e., find the outstanding balance at the desired point in time. Then, deduct the future value of the additional payments made from the outstanding balance to obtain the correct balance owed.

a. Determine the nominal interest rate per annum, compounded monthly, that is equivalent to the contract rate on the mortgage and the monthly payment, rounded up to the next higher $10.

Calculation

Press	Display	Comments
6 ■ NOM%	6	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	6.09	Equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	5.926346	Compute equivalent j_{12} rate
375000 PV	375,000	Present value of loan
300 N	300	300 monthly compounding periods
0 FV	0	Payments fully amortize loan over 300 months
PMT	–2,399.274839	Monthly payment
2400 +/– PMT	–2,400	Re-enter the rounded payment

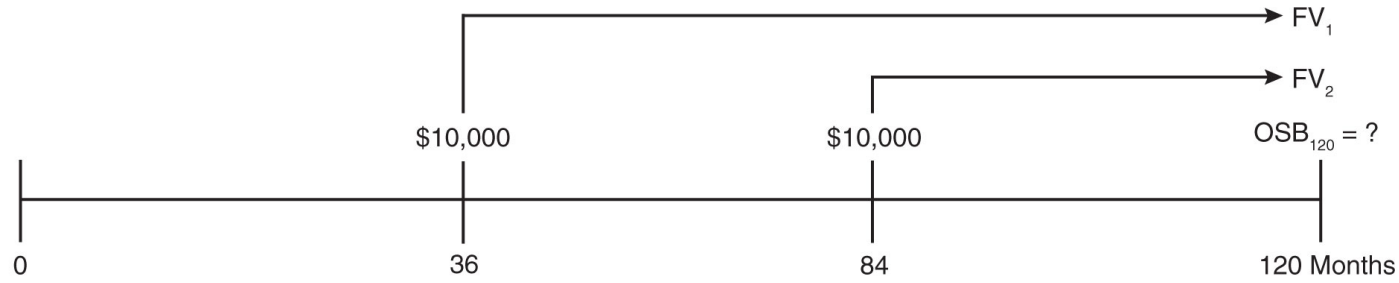
b. Calculate the outstanding balance at maturity ignoring the extraordinary principal repayments.

Calculation (continued)

Press	Display	Comments
120 INPUT ■ AMORT ===	285,549.451499	OSB_{120}
285549.45 →M	285,549.45	Store OSB_{120}

Had the borrower made periodic payments as due and not made any additional payments, the balance due at maturity would be $285,549.45.

c. To identify the correct balance, the analyst must recognize the impact of the extraordinary principal prepayments. These are credited, with interest over the time between when they were paid and the end of the contractual term. This is done by determining their future values (at the contract rate of interest) at the end of the term. These amounts are then subtracted from the outstanding balance calculated previously.



where: $OSB_{120} = \$285{,}549.45 - FV_1 - FV_2$

$OSB_{120} = \$285{,}549.45 - \$15{,}125.90 - \$11{,}940.52$

$OSB_{120} = \$258{,}483.03$

Calculation (continued)

Press	Display	Comments
10000 PV	10,000	Present value as of month 36
84 N	84	84 periods (120–36)
0 PMT	0	No intervening payments
FV	–15,125.897249	FV of first balloon payment at 120th month
15125.9 +/– M+	–15,125.9	Add to OSB_{120} in memory
36 N	36	36 periods (120–84)
FV	–11,940.522965	FV of second balloon payment at 120th month
11940.52 +/– M+	–11,940.52	Add to previous balance in memory
RM	258,483.03	OSB due at end of period 120 after balloon payments

Thus, the impact of the $10,000 balloon payments made at the end of the third and seventh years is to reduce the balance due at maturity from $285,549.45 to $258,483.03.

Method Two: Current Balance

Using the current balance method, first find the outstanding balance at the time when the first balloon payment is made. This lump sum payment is then deducted from the outstanding balance and the difference becomes the "new" loan over the remaining amortization. Consider this new loan as a present value and then find the outstanding balance at the next balloon payment date, deduct the additional balloon payment from this balance, and proceed accordingly until the end of the term.

a. Determine the nominal interest rate per annum, compounded monthly, that is equivalent to the contract rate on the mortgage and the monthly payment,

rounded up to the next higher $10.

Calculation

Press	Display	Comments
6 ■ NOM%	6	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	6.09	Equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	5.926346	Compute equivalent j_{12} rate
375000 PV	375,000	Present value of loan
300 N	300	300 monthly compounding periods
0 FV	0	Payments fully amortize loan over 300 months
PMT	–2,399.274839	Monthly payment
2400 +/– PMT	–2,400	Re-enter the rounded payment

b. Calculate the outstanding balance at the time the first extraordinary payment is made (OSB_{36}).

Calculation (continued)

Press	Display	Comments
36 INPUT ■ AMORT ===	353,466.886931	OSB just before the first extraordinary payment

The outstanding balance just before the first extraordinary payment is $353,466.89.

c. Deduct the amount of the prepayment.

Calculation (continued)

Press	Display	Comments
353466.89 – 10000 = PV	343,466.89	New balance after prepayment

The amount remaining after the first prepayment is $343,466.89 ($353,466.89 – $10,000).

d. Calculate the outstanding balance at the date of the second balloon payment of $10,000 and deduct the amount of prepayment. Note that the second prepayment is made 84 months into the original contract but only 48 months after the first prepayment.

Calculation (continued)

Press	Display	Comments
48 INPUT ■ AMORT ===	305,452.520147	OSB (Month 84)
305452.52 – 10000 = PV	295,452.52	New balance after second prepayment

The outstanding balance at the time of the second prepayment is $305,452.52. After deducting the $10,000 prepayment, the remaining balance is $295,452.52.

e. Calculate the outstanding balance at the end of the contractual term. The contractual term occurs 36 months after the second principal prepayment (120 – 84 = 36). As the balance to be repaid is based on the amount owing after the second prepayment, 36 months is used to calculate the balance at the term of the mortgage.

Calculation (continued)

Press	Display	Comments
36 INPUT ■ AMORT ===	258,483.03575	Balance at term after two balloon payments

Thus, the impact of the $10,000 balloon payments made at the end of the third and seventh years is to reduce the balance due at maturity from $285,549.45 to $258,483.04.

Full Prepayment

In a closed mortgage with a term under five years, there is no legal obligation on the part of the lender to allow total repayment during the duration of the term.[4] However, lenders do typically allow prepayment of the remaining outstanding balance but with a penalty of the greater of three months' interest or the *interest rate differential* (IRD)[5] on the amount to be prepaid. The equation for calculating the monthly interest penalty is as follows:

$$\text{Monthly Interest Penalty} = \text{OSB} \times i_{mo} \times \text{Number of Months}$$

interest rate differential (IRD)
the difference between the contract rate of interest and the current rate of interest over the remaining term, which the borrower may have to pay the lender when fully prepaying an outstanding balance

The IRD calculation is an attempt by the lender to recover the loss of interest that will occur as a result of allowing prepayment. When interest rates decline, the lender loses the benefit of the higher contractual rate if they allow prepayment. The IRD is a calculation based on the difference in rates between the contract and the current rate (for the remaining term) applied to the time frame remaining in the loan.

IRD Penalty = OSB × Interest Rate Difference × Length of Time Remaining in the Term

ALERT

Each lender will differ in the rate used to determine the actual IRD rate. It is important to examine the lender's policy and method carefully as there are different interpretations of an IRD.

Other penalties may also be used, at the lender's discretion. Determination of the amount to be paid involves calculation of the outstanding balance, the interest adjustment (if prepayments occur between regularly scheduled payments), and the prepayment penalty. Application of these calculations is presented in the following illustration.

Illustration 13.4

A mortgage for $125,000 is written at 7.25% per annum, compounded semi-annually, with monthly payments, a 20-year amortization, and a 5-year term. The mortgage contract permits the borrower to prepay the full amount of the loan at any time subject to the payment of a penalty, which is the greater of a three months' interest penalty or the interest rate differential. Payments are rounded up to the next higher dollar. At the time of prepayment, the current comparable interest rate is 4% per annum, compounded semi-annually.

If the borrower wants to prepay this loan at the end of the first year (with the 12^{th} payment), calculate the amount of the payout penalty and the total outstanding balance owed to the lender.

Solution:

a. Calculate the monthly equivalent interest rate, the monthly payments, and the outstanding balance at the time of prepayment.

Calculation

Press	Display	Comments
7.25 ■ NOM%	7.25	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	7.381406	Calculate equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	7.14286	Calculate equivalent j_{12} rate
125000 PV	125,000	Enter loan amount
240 N	240	Enter initial amortization
0 FV	0	Payments amortize loan over 240 months
PMT	–979.871611	Calculate payment required to amortize loan
980 +/– PMT	–980	Enter rounded payment
12 INPUT ■ AMORT		
= = =	122,074.015476	OSB at time of prepayment

The monthly payment is $980 and the outstanding balance after 12 payments is $122,074.02.

b. Calculate the 3 months' interest penalty and the IRD penalty.

3 Months' Interest Penalty

Penalty = OSB_{12} × imo × 3
Penalty = $122,074.02 × 0.595238% × 3
Penalty = $2,179.89

Calculation (continued)

Press	Display	Comments
RCL I/YR ÷ 12 =	0.595238	Monthly interest rate (expressed as a percentage)
%	0.00595238	Monthly interest rate (expressed as a decimal)
× 122074.02 × 3 =	2,179.894095	Prepayment penalty (3 months' interest)

Interest Rate Differential (IRD)/Yield Maintenance Penalty

First, find the j_2 difference in rates (3.25% = 7.25% – 4%). Then convert this j_2 difference into an equivalent monthly rate (3.228211% per annum, compounded monthly, or 0.269018% per month).

IRD Penalty = OSB × Interest Rate Difference × Length of Time Remaining in the Term
IRD Penalty = $122,074.02 × 0.269018% × 48
IRD Penalty = $15,763.23

c. Determine the total payout.

Calculation

Press	Display	Comments
3.25 ■ NOM%	3.25	j_2 difference in rates
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	3.276406	Calculate equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	3.228211	Calculate equivalent j_{12} rate
÷ 12 =	0.269018	Equivalent i_{mo} (expressed as a percentage)
%	0.00269018	Equivalent i_{mo} (expressed as a decimal)
× 122074.02 × 48 =	15,763.226943	IRD prepayment penalty
+ 122074.02 =	137,837.246943	Total payout amount

The total payout will be the greater prepayment penalty plus the outstanding balance at the time of prepayment. In this situation, the IRD is the larger penalty ($15,763.23 vs. $2,179.89). Therefore, the total payout is $137,837.25 ($122,074.02 + $15,763.23).

It is also important to consider if prepayment is worthwhile. Borrowers can examine the cost/benefit of prepayment by analyzing the benefit of decreased payments (due to a decline in interest rate) versus the cost of the penalty. The following illustration explores this topic.

Illustration 13.5[6]

An investor has a property subject to an existing mortgage. The $225,000 mortgage was obtained 5 years ago on January 1. The loan bears interest at 7% per annum, compounded semi-annually, and provides for monthly payments over a 25-year amortization period. All payments have been made on time. On January 1 of the current year (five years since the loan began), the lender offers to renegotiate the mortgage at 5% per annum, compounded semi-annually, with a 20-year term and amortization providing the borrower will pay a penalty equal to 6 months' interest.

Should the property owner accept this offer? In other words, will the benefit of decreased monthly payments outweigh the cost of the interest penalty? (Ignore income tax considerations.)

Solution:

a. Calculate the monthly payment and the outstanding balance on January 1 of the current year under the terms of the original contract.

Calculation

Press	Display	Comments
7 ■ NOM%	7	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	7.1225	Equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM	6.900047	Compute equivalent j_{12} rate
225000 PV	225,000	Loan amount
300 N	300	Amortization period
0 FV	0	
PMT	–1,575.935447	Monthly payment
1575.94 +/– PMT	–1,575.94	Enter rounded payment
60 INPUT ■ AMORT ===	204,850.014011	OSB after 60th payment
204850.01 →M	204,850.01	Store OSB_{60} for use in part b

The monthly payment on the original loan (at $j_2 = 7\%$) is $1,575.94 and the outstanding balance owing today (at the end of 5 years on the original loan) is $204,850.01.

b. Calculate the interest penalty.

Interest Penalty = $204,850.01 × i_{mo} × 6
Interest Penalty = $204,850.01 × 0.575004% × 6
Interest Penalty = $7,067.37
where: 0.575004% = 6.900047% ÷ 12 (the original contract rate)

Calculation (continued)

Press	Display	Comments
RCL I/YR	6.900047	j_{12}
÷ 12 =	0.575004	i_{mo} as a percentage
%	0.00575004	i_{mo} as a decimal
× RM =	1,177.895649	One month interest penalty
× 6 =	7,067.373892	Six months' interest penalty

c. Compute the difference between the monthly payment under the original contract and the payment under the proposed terms. Then calculate the

present value of the monthly savings.

Calculation (continued)

Press	Display	Comments
5 ■ NOM%	5	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	5.0625	Equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	4.948699	Compute equivalent j_{12} rate
RM	204,850.01	Amount to be amortized over 20 years
PV	204,850.01	Input as PV
240 N	240	Remaining term
0 FV	0	
PMT	–1,346.120694	Monthly payment
1346.12 – 1575.94 =	–229.82	Monthly savings under new contract
PMT	–229.82	
PV	34,973.557359	Present value of savings

The payment under the new lower contract rate is $1,346.12 per month. The monthly savings under the new contract is $229.82 ($1,575.94 – $1,346.12). Since the present value of the monthly savings of $34,973.56 exceeds the 6 months' interest penalty of $7,067.40, the property owner should accept the offer. To complement the above analysis, the following calculation may also be performed.

d. Calculate the number of months' interest that may be charged such that the owner will be indifferent between continuing to make the payments under the original contract and entering into the new agreement, i.e., calculate the break-even point.

Calculation (continued)

Press	Display	Comments
34973.56 ÷ 1177.9 =	29.691451	The break-even point (expressed as the number of months' interest penalty) is the PV of the savings divided by one month's interest penalty

The break-even point is 29.691451 months, calculated as the PV of the savings divided by one month's interest penalty ($34,973.56 ÷ $1,177.90).

Valuation of Mortgage Investments

Another area for managerial decisions concerns the possible sale of the mortgage investment. A mortgage is an asset that can be sold to other investors. The valuation of the investment forms one (but only one) of the major sources of information in investment management decisions.

Book Value of a Mortgage

The *book value of a mortgage* equals the amount of principal outstanding at a particular point in time.

book value of a mortgage
amount of principal outstanding at a particular point in time

Illustration 13.6(a)

Consider a 2-year old mortgage for $100,000 with a 25-year amortization period, 5-year contractual term, monthly payments rounded up to the next higher dollar, and interest at 9% per annum, compounded semi-annually. Calculate the book value of the mortgage today, i.e., at the end of the second year.

Solution:

The book value of this mortgage today equals the outstanding balance after 24 monthly payments.

Calculation

Press	Display	Comments
9 ■ NOM%	9	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	9.2025	Equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	8.835748	Compute equivalent j_{12} rate
100000 PV	100,000	Loan amount
300 N	300	Amortization period
0 FV	0	
PMT	–827.977389	Monthly payment
828 +/– PMT	–828	Re-enter rounded monthly payment
24 INPUT ■ AMORT ===	97,602.703751	OSB after 24th payment
60 INPUT ■ AMORT ===	93,114.267832	OSB after 60th payment (used in next section)

The book value of the mortgage at the end of the second year is $97,602.70. This value is of most interest to the mortgage holder. However, in investment terms this value is of little interest, except for accounting, tax, and annual report purposes.

Market Value of a Mortgage

The *market value of a mortgage* is an estimate of the amount that might be received if the existing mortgage was to be sold in an arm's length transaction under current conditions. The market value rests with a determination of what the remaining benefits accruing to the holder of the mortgage are worth in the marketplace.

market value of a mortgage
an estimate of the amount that might be received if an existing mortgage was sold in an arm's length transaction under current conditions

Illustration 13.6(b)

In the mortgage under consideration, the relevant facts are that the mortgage has 36 payments of $828 remaining, plus an outstanding balance of $93,114.27 to be paid at the end of its contractual term. Assume that mortgages with 3-year terms (the time remaining for the mortgage investment) that have similar security to the mortgage under consideration are currently being initiated at 5%

per annum, compounded semi-annually, in the marketplace. Calculate the market value of the mortgage.

Solution:

The market value of this mortgage is the amount that someone requiring 5% per annum, compounded semi-annually, would pay for the remaining 36 payments and outstanding balance on the mortgage, i.e., the present value of the remaining benefits at the prevailing market rate of interest.

Calculation

Press	Display	Comments
5 ■ NOM%	5	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	5.0625	Equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	4.948699	Compute equivalent j_{12} rate
36 N	36	Number of payments remaining
828 +/– PMT	–828	
93114.27 +/– FV	–93,114.27	OSB term
PV	107,940.186895	Market value

With 3 years remaining in the term, the mortgage will have a market value of $107,940.19 at 5% per annum, compounded semi-annually. This is $10,337.49 ($107,940.19 – $97,602.70) more than its book value. The premium results because market rates have declined to less than the contract rate.

Investment Value of a Mortgage

The *investment value of a mortgage* represents the maximum price an investor is willing to offer for the mortgage after considering the rate of return that could be earned on other competing investments. If an investor offers to purchase the previous mortgage for $107,940.19, the mortgage will sell at a $10,337.49 premium or bonus.[7] However, the actual price paid for a mortgage will not necessarily be equal to its market value – the transaction price results from the circumstances affecting buyer and seller and their relative success in negotiations. The prospective purchaser will consider the rate that could be

earned on competing investments (the opportunity cost) and determine a maximum offering price based on this yield.

investment value of a mortgage
the maximum price an investor is willing to offer for a mortgage after considering a rate of return that could be earned on other competing investments

Illustration 13.6(c)

The current holder of the mortgage will determine a minimum selling price based on the yield that could be earned on funds received from the sale of the mortgage asset, i.e., the lender's opportunity cost. Armed with (but not revealing) these constraints, the two parties will enter into negotiations, settling on a transaction price somewhere within the range established by the vendor's minimum and the prospective purchaser's maximum prices:

Purchaser's Maximum:	$110,000.00
Market Value:	$107,940.19
Vendor's Minimum:	$100,000.00
Book Value:	$97,602.70
Contract Rate:	j_{12} = 8.835748% (j_2 = 9%)
Market Rate:	j_{12} = 4.948699% (j_2 = 5%)

Calculate the purchaser's expected yield (expressed as a j_{12}) if the sale price was $107,000.

Solution:

With a price of $107,000 for the right to receive the remaining mortgage payments (and outstanding balance), the purchaser's expected yield, expressed as an annual rate, compounded monthly, is calculated as follows:

Calculation

Press	Display	Comments
107000 PV	107,000	Sale price
36 N	36	Number of remaining payments
828 +/– PMT	–828	Payments
93114.27 +/– FV	–93,114.27	OSB term
12 ■ P/YR	12	
I/YR	5.284551	j_{12} yield

In this illustration, the mortgage will be sold at a $9,397.30 premium ($107,000.00 – $97,602.70) to yield the purchaser a rate of approximately 5.28% per annum, compounded monthly.

Premium = Sale Price – Outstanding Balance at Time of Sale[8]

Often when mortgages are sold, the original lender will continue to administer the loan for the new owner. In those cases, the loan administrator will be compensated by payment of an administration fee or by a higher sale price.

Administration and Management at the End of the Loan Term

There are two topics that may concern a lender at the end of a mortgage term: the calculation of the outstanding balance on a partially amortized loan or the final payment on a fully amortized mortgage loan, and the refinancing of the outstanding balance by way of a "rollover" into a new mortgage contract.

Outstanding Balances and Final Payments

As discussed previously, partially amortized mortgages are almost universally used for long-term financing in Canada. On such loans, it is necessary to determine the amount owing on the loan at the end of the contractual term (the *outstanding balance*). This amount will be used as the basis for a payout or for refinancing at the then prevailing mortgage rate. In the United States, it is common to see fully amortized loans and thus, the calculation of a final payment is typically necessary. In Canada, a short-term loan may be fully amortized and the calculation of a final payment will be needed.

Calculation of Final Payments on Fully Amortized Loans

If payments are rounded up, more principal will be repaid with each payment than is required to amortize the loan, resulting in faster repayment of the loan amount. In other words, you are overpaying slightly with each payment. When the payments are rounded up to the nearest cent, the final payment necessary to repay the loan amount will be smaller than the regular payments. If the payments are rounded up to the next higher dollar, or the next higher $10, etc., *the number of payments* required may decline in addition to reducing the size of the final payment.

Alternatively, if payments are rounded down to the nearest cent, you may in fact be slightly underpaying by a portion of a cent with each payment, meaning an interest adjustment will be owing as part of the final payment – the final payment will be larger than a regular payment. However, this is not a common issue in practice, since fully amortized loans in Canada are very rare.

If the impact of rounding payments (whether they are rounded by a fraction of a cent or more) is ignored, a different rate of interest than is specified in the mortgage contract would result.

This section illustrates how to determine the number of payments and the size of the final payment required to fully amortize a mortgage loan.

Illustration 13.7

A $30,000 mortgage loan was written at a contract rate of 9% per annum, compounded semi-annually, to be fully amortized over 15 years with monthly payments. Calculate the size of the final payment.

Solution:

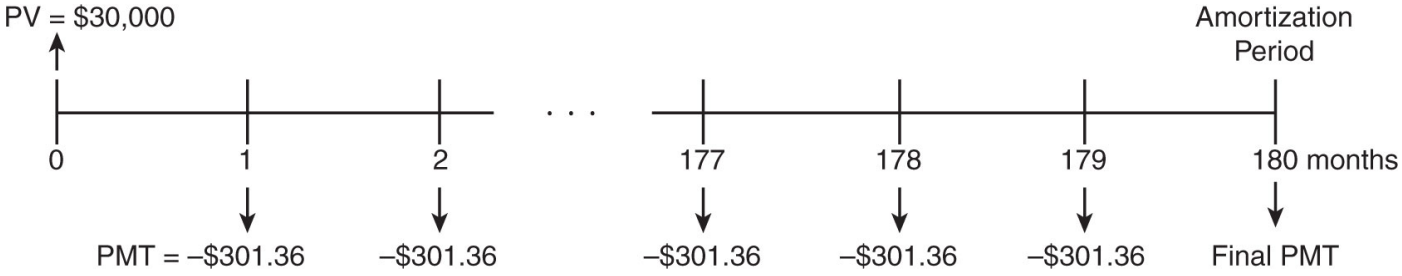
Begin by calculating the monthly payments, rounded to the nearest cent.

Calculation

Press	Display	Comments
9 ■ NOM%	9	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	9.2025	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	8.835748	Compute nominal rate with monthly compounding
30000 PV	30,000	Enter loan amount
15 × 12 = N	180	Enter amortization period in months
0 FV	0	FV is not to be used
PMT	–301.355655	Compute monthly payment
301.36 +/– PMT	–301.36	Enter rounded payment
N	179.994605	Recompute amortization period

The calculation indicates that the true revised amortization period on the loan is 179.994605 months. In reality, 179 full payments will be made, along with

one smaller final payment. Therefore, a total of 180 payments will be made, with the last one smaller than the rest.



Compute the outstanding balance after the 180th payment. Remember that when the loan amount is entered as a positive number, the outstanding balance also comes out positive if the borrower still owes money. In this case, the outstanding balance comes out negative, indicating that if the full $301.36 was paid for the 180th payment, the borrower would have overpaid the loan. To find the correct final payment, subtract the outstanding balance from the regular monthly payment.

Calculation (continued)

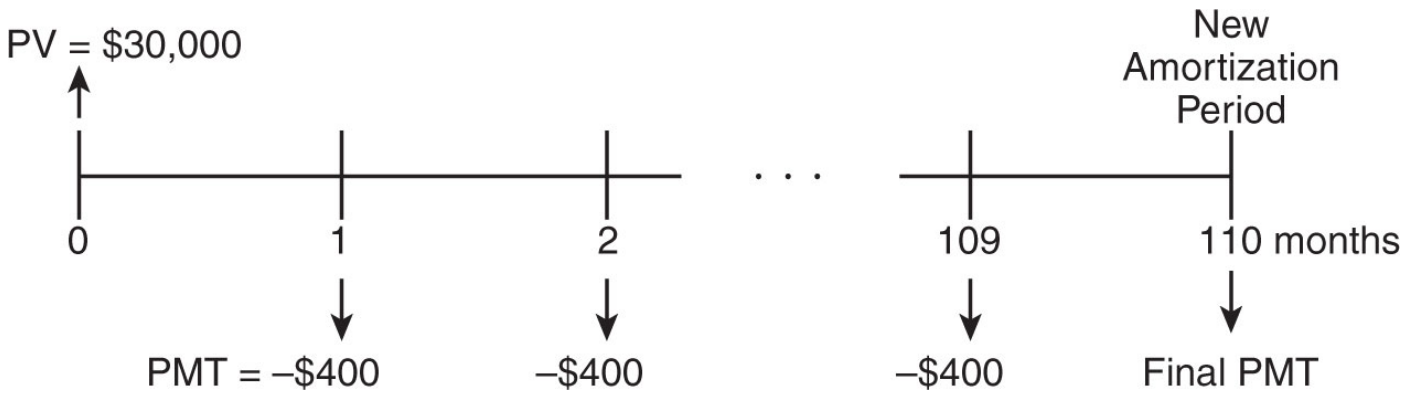
Press	Display	Comments
	179.994605	Displayed from previous calculation
180 N	180	Enter number of payments to be made
180 INPUT ■ AMORT	PER 180–180	
= = =	–1.619854	Amount of overpayment if 180th payment made
+ RCL PMT +/–	301.36	Subtract overpayment from regular payment
=	299.740146	Amount of final payment

The final payment under this mortgage loan is $299.74.

Now assume that the payments for this loan were rounded to the next higher $100. How would this affect the final payment?

Calculation (continued)

Press	Display	Comments
	299.740146	Displayed from previous calculation
400 +/– PMT	–400	Enter rounded payment
N	109.524107	Recompute amortization period



Notice that the amortization period is now only 109.524107 months – this means that only 110 payments are needed to repay this loan, 109 full payments of $400 and one smaller 110th payment. Because of rounding, payments for months 111 to 180 are no longer required. This result shows the importance that the amortization period must always be recomputed after the rounded payment has been entered in final payment calculations.

Calculation (continued)

Press	Display	Comments
	109.524107	Displayed from previous calculation
110 N	110	Enter number of payments to be made
110 INPUT ■ AMORT	PER 110–110	
= = =	–189.991279	Amount of overpayment if 110th payment made
+ 400	400	Subtract overpayment from regular payment
=	210.008721	Amount of final payment

The final payment under this mortgage loan is $210.01.

Example 13.1

A $40,000 mortgage loan was written at 10% per annum, compounded semi-annually, to be fully amortized over 20 years with monthly payments rounded to the next higher $10. Calculate the size of the required monthly payment and the size of the final payment.

Abbreviated Solution:

j_{12} = 9.797815%

Payment = $380.665771 = $390 (rounded)

Revised Amortization = 223.395734 months

OSB_{224} = –$235.284533

Final Payment = $154.72

Rollovers and Refinancing

At the end of the contractual term of a partially amortized mortgage loan, the outstanding balance must be paid. Occasionally, if the borrower has accumulated sufficient wealth during the loan term, this amount may be paid off in cash. More generally, the amount is refinanced, either with the original lender or a new lender. In either case, what is essentially a new contractual relationship will be initiated. The lender will want to consider the borrower's ability to support mortgage payments at the interest rate that prevails at the time of refinancing and the ability of the property to provide adequate security for the loan.

In the case of a refinancing with the original lender, if the borrower has made all payments as due, the lender will generally offer a refinancing or rollover, charging a nominal fee for processing. The lender will determine the payments necessary to repay the outstanding balance at the prevailing market rate and propose a new loan arrangement to the borrower (generally well in advance of the end of the original contract). However, the borrower is under no obligation to accept; they may shop around for more attractive terms to refinance. Further, the lender may offer a single proposal to the borrower, two or more alternative loan packages, or may invite the borrower to discuss and negotiate a new loan.

Although the borrower can seek a more attractive loan from a new lender, there is one factor that inhibits this to some degree. If a new loan with a new lender is to be used to refinance (and the old mortgage is cashed out), an appraisal, credit analysis, and survey will likely be required. As well, legal fees and disbursements may have to be paid. These substantial costs may well result in an alternative loan being less attractive than the "rollover" even though the alternative loan itself is at more attractive terms.

ARREARS AND DEFAULT

Arrears (tardiness in making payments) and *default* (no payments being made) are not common on mortgage loans. Lenders typically undertake considerable analysis, prior to the initiation of a loan, to limit the risk of arrears and default. However, as very stringent underwriting criteria would result in few, if any, approvals, lenders must strike a balance between their desire to lend funds in

the market and to maintain risk within tolerable bounds. One result of reaching an accord between these contrary objectives is that mortgage accounts are occasionally initiated where significant default risk exists. In addition, individual borrowers' financial resources frequently change from those existing or anticipated at the time the mortgage was created. Loss of employment, business cycles, accidents, and a host of other factors may cause a borrower to default even in situations where problems of this sort appeared as remote possibilities at the time that funds were advanced. Finally, market conditions and property values may change in a fashion that results in the borrower having lost a financial incentive to honour the terms of the mortgage. In declining markets, the borrower's equity may quickly vanish, particularly in the case of high loan-to-value ratio loans.

arrears
overdue payments on a loan

default
failure to make payments on a loan

Each of these reasons may cause the borrower to default on payments; the lender must then determine the reasons for the default, and decide what action is required. This decision calls for a great deal of skill and judgment on the part of the lender. Too drastic an action may result in unnecessary unpleasantness and costs to both parties – but long delays in taking action, or under-estimation of the action required, may make matters worse. Depending on the circumstances, the lender may decide to grant extra time, adjust repayment terms, or use legal remedies to recover the amount of the principal, accrued interest, and costs. If legal action is necessary for the arrears collection, the lender should leave all discussions to the solicitor and the borrower.

When borrowers in real estate financing transactions fail to comply with the exact terms of their contractual agreement, whether a mortgage or an agreement for sale, adjustments to the financial arrangement must be made to account for the deficiency. Delinquencies in the repayment scheme distort the underlying annuity assumption and result in a problem of valuing the outstanding balance due at a given point in time. Determining the outstanding

balance owing where the borrower falls into arrears and eventually stops making their contractual payments is complex.

Mathematically, there are several methods that could be used to account for arrears. The simplest method might involve programming a spreadsheet to calculate the loan balance daily, accounting for interest accruing each day and subtracting any payments made. On a financial calculator, this method could be manually carried out by calculating a new present value of the loan whenever payments are made and then re-calculating the loan terms from that point. However, this would be a very time-consuming calculation. Another method to account for arrears and default is as follows:

> Outstanding Balance Owing = Future Value of Loan if No Payments Made – Future Value of Payments Made

The impact of each late or missed payment is calculated separately, to determine the indebtedness on an account in arrears. As mentioned earlier, most lenders will use computer software to help with these time-consuming calculations.

CONCLUSION

The process of managing individual loans is not always straightforward because many factors can come into play throughout the life of a mortgage. The borrower will likely want to pay off the mortgage as quickly as possible, particularly if changes such as increases in income occur. However, the borrower might not understand the implications of prepayment and how it affects the other terms of the mortgage. As has been demonstrated, it is possible to accommodate changes throughout the life of the loan. Borrowers should be familiar with the limitations to prepayment, such as the three-month penalty imposed by the *Interest Act*, and they should be aware of any penalties that might have been included in their mortgage agreement. On the other hand, the lender will want to ensure that borrowers are doing their part to ensure a smooth management process. This includes ensuring that all required payments (e.g., property taxes) are made, and that payments on the mortgage itself are made promptly and in full. Both the borrower and the lender have a vested interest in individual loans; it is in each party's interest to ensure that they fulfil the terms of the loan.

1 Increasingly, institutional lenders credit the borrower's prepayment of real property taxes with interest. Practice varies among lenders; some offer interest at the mortgage rate, some at a savings rate, while others offer no interest at all. The insurance should be in favour of the lender, with an endorsement to this effect on the actual policy so the insurer is aware of the lender's interest in the property. The requirement for proper insurance is occasionally overlooked by private lenders. This omission greatly increases the risk, and in many cases the lender can lose some, if not most of the invested capital.

2 As contrasted to management of mortgage loan portfolios.

3 If, for some reason, the first payment started one month later than in the above example, then one would have to add the number of days in the intervening month to the answer from this formula to find the correct number of days, i.e., funds advanced November 12, payment period begins January 1, first payment February 1.

4 Mortgages with terms greater than five years may be prepaid under the *Interest Act*, as previously discussed.

5 The interest rate differential (also known as yield maintenance) is the difference in the contract rate of interest and the current rate of interest.

6 This illustration is meant to demonstrate the cost/benefit relationship and contains elements that are not necessarily seen in the Canadian mortgage market today. For instance, the fully amortized loan and the interest penalty used are not typical – in reality, it would be more common to use a partially amortized loan and IRD to account for the prepayment.

7 When a mortgage sells for more than its book value, it is said to sell at a premium. When one is sold for less than its book value, it is said to sell at a discount. Mortgages that sell at book value sell at par.

8 A negative premium is referred to as a *discount*.