CHAPTER 12

MORTGAGE UNDERWRITING AND BORROWER QUALIFICATION

Learning Objectives

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

- ☑ Define the five Cs of credit
- ☑ Explain the loan application and credit analysis procedures in mortgage underwriting
- ☑ Calculate the constraints imposed on the value of the mortgage by the lending value of the property and the income of the loan applicant
- ☑ Explain the relationship between the financial terms of a mortgage and their effect on the loan amount
- ☑ Discuss residential and commercial lending practices

INTRODUCTION

This chapter covers lenders' policies and lenders' review of prospective borrowers prior to granting mortgage loans. A detailed analysis of the residential underwriting process is presented, followed by a brief discussion of the similarities and differences between residential and commercial mortgage lending.

RESIDENTIAL (OWNER-OCCUPIED) MORTGAGE UNDERWRITING

Borrower Qualification

Residential mortgage loans are mortgage loans secured by residential property that is owner-occupied. Since there is no income to the owner from the property, the lender must examine the borrower's personal income as the source of funds to make mortgage payments – a procedure known as *borrower qualification*. Because the borrower will promise to make a series of payments according to a loan agreement, the lender needs information about the value of the subject property and the personal characteristics of the borrower in order to determine whether or not to make the loan.

borrower qualification
the lender's examination of the borrower's personal income as the source of funds to make mortgage payments

Five Cs of Credit

Mortgage professionals must consider the five Cs of credit each time they are qualifying a borrower. An analysis of the five Cs will increase the quality of lending decisions made by mortgage professionals.

- **Character:** Will the borrower repay the loan? This is a subjective opinion based on the borrower's current employment situation, educational background, business experience, length of time at current residence, etc. Much of this information is obtained from the mortgage loan application and verified by the mortgage professional and lender.
- **Capital:** How much money will the borrower personally invest in the property (i.e., the down payment)? Mortgage professionals should also consider the borrower's ability to save money and accumulate assets (this is addressed in the assets and liabilities section of the mortgage loan application).
- **Capacity:** Can the borrower repay the loan? This is a critical factor to review. Looking at a borrower's annual gross income and using lending constraints, such as debt service ratios, is necessary to determine capacity.
- **Credit:** What is the borrower's credit/repayment history? Mortgage professionals should analyze a borrower's credit history by reviewing a credit report from a credit bureau.
- **Collateral:** What is the additional security for the loan in case a borrower is unable to repay it? In a residential real estate transaction, the real property is typically pledged as security for the loan.

Reasons Buyers Fail to Qualify for a Favourable Rate

Home buyers enter the mortgage process with high hopes but often are unable to qualify for the rate that they expected to qualify for. Mortgage brokers should be prepared to explain why this may be the case. Failure to qualify for a favourable rate may be due to one or a combination of the following:

- **Credit Issues:** Inaccuracies, such as an incorrect birth date on the credit profile, a lower credit score, a lack of an active credit, which may occur following bankruptcy, and active collections can disqualify a borrower from qualifying for the best-available mortgage rates.
- **Rising House Prices:** Home buyers often base their expectations on what the people they know who have recently bought homes were able to qualify for. However, when home prices are rising rapidly, rates may also be rising.
- **Consumer Debt and Other Financial Commitments:** Lenders are especially wary of borrowers with high debt payments and are concerned with the borrowers' ability to service additional debt payments without defaulting. A borrower with large amounts of debt and other financial commitments, such as alimony or child support payments, is a riskier option for a lender. As a result, lenders may charge a higher rate and limit the size of the loan to account for this risk.
- **Income:** Lenders consider the income of potential borrowers to determine their future loan repayment abilities. Those who are self-employed generally can reduce income taxes through write-offs, but these write-offs will also reduce the amount of income that can be considered on a mortgage application. Lenders are also wary of borrowers who do not have guaranteed hours or have inconsistent income, such as bonuses or commission. The lender will see any uncertainty regarding the borrower's income as a risk and may charge a higher rate or limit the size of the loan to account for this risk.

Source: Chris, A. 2022. "10 Reasons Why Homebuyers May Not Qualify for the Best Rates". *Canadian Mortgage Trends.* April 5, 2022.

Pre-Approved Mortgages

When shopping for real estate, a prospective purchaser may choose to obtain a pre-qualification certificate from the mortgage lender, regardless of how certain the borrower is that they will qualify for a mortgage. A pre-approved mortgage calculates the maximum loan for which the borrower qualifies, based on the borrower's current financial situation and a satisfactory credit review. A pre-approved mortgage also guarantees the borrower's interest rate for 60-120 days while the borrower looks for a property, even if the interest rate for the selected term increases. If rates decrease before the borrower completes the purchase, the borrower is typically given the lowest rate during that period for the term selected. Combining this pre-approved mortgage information with the cash down payment provides the borrower with a realistic price range. The actual terms and mortgage amount will be finalized based on the value of the home purchased and will often be subject to a satisfactory property appraisal.

Lender Risks

The underwriting process is used to estimate the level of risk that may be associated with any particular loan proposal. While the interest rate charged on classes or types of loans (e.g., residential owner-occupied, vacant land) reflects the relative level of risk of the type of loan, it does not address the question of the risk on one particular loan of a given type of mortgage investment. Thus, underwriting is concerned with *default risks* on specific loans, rather than the general risks of mortgage lending. It is concerned with a specific borrower's ability to honour the terms of a proposed mortgage contract (i.e., risk of default) and the value of the specific security provided as a component of the contract (i.e., capital risk).

In discussions of underwriting, too much emphasis is often placed on the nature and value of the interest in real property that is to be used to secure the mortgage. The lender does not wish to be in the position of realizing the value of the security through foreclosure or court sale; the lender's objective is to have a loan that will be repaid according to the loan agreement. The lender will take action against the property only as a last resort. Contemporary mortgage underwriting practice emphasizes the effective qualification of borrowers to ensure, insofar as is possible, that the lender's primary investment objectives will be met. The process attempts to ensure that the borrower has the financial ability to honour the loan's contractual obligations and that those will, in fact, be honoured. The secondary concern is that, in the (it is hoped, unlikely) event of default on payments, the property will be of sufficient value to cover the outstanding balance on the mortgage plus any costs involved in exercising foreclosure or other default remedies.

A mortgage lender is dealing with an uncertain event. The analysis of potential default risk involves not only the estimate of current and future ability to pay but also an estimate of the likelihood that the borrower will pay. Therefore, there is both a financial and behavioural forecast involved: can and will the borrower make the payments? Realistically, no lender can completely eliminate default and capital risk since so little is known in advance about the causes of default. If a lender is too conservative in granting loans, the default and capital risk may be very low, but the lender could eliminate loan opportunities for which the expected yield more than compensates for the extra risk. Given that not all risk can be eliminated (or lenders might not choose to

eliminate all risk), the lender can seek to develop a diversified portfolio, thereby spreading risk.

Mortgage Classification

Mortgages can be classified in a number of different ways based on lender risk.

Prime Mortgages

Prime mortgages (also known as “A” mortgages) represent the majority of mortgage lending in Canada. This type of lending typically deals with borrowers who can qualify for mortgages based on their credit score and/or gross income. Prime mortgages are less risky since the chances of the borrower defaulting are fairly low.

Alternative-A Mortgages

Lenders who specialize in borrowers who have good credit, but non-standard situations, such as self-employment, are usually referred to as “Alt-A” (Alternative-A) or “A minus” lenders. Alt-A mortgages are riskier for the lender than prime mortgages since the borrower’s income or employment income information is limited.

Subprime Mortgages

A subprime mortgage (also referred to as “B”, nonprime, nearprime, nonconforming, or high-risk) is a mortgage that is granted to a loan candidate who is considered to be high-risk, due to one or a combination of:

- poor or limited credit rating
- non-verifiable income
- a previous consumer proposal
- a bankruptcy

To mitigate their risk, subprime lenders will price accordingly, charging increased interest rates and incorporating higher administration and processing fees compared to prime lenders. Subprime lenders will also spend a lot of time conducting their due diligence for each potential borrower, use lower loan-to-value ratios, and may mandate guarantors in order to further minimize the risk associated with subprime lending.

US Subprime Market

US subprime loans are usually classified as those where the borrower has a FICO score below 680. The FICO score indicates to the lender the rate of default of the borrower. Those individuals with credit scores below 620 have a much higher rate of default than those with credit scores above 720. In the 1980s, subprime borrowers were denied credit as lenders were restricted by law from charging interest rates high enough to compensate for the risk. However, adoption of the *Depository Institution Deregulatory and Monetary Control Act* in 1980 eliminated the interest rate caps and made subprime lending more feasible.

In addition, the *Tax Reform Act* of 1986 eliminated interest deductions on consumer and auto loans while allowing interest deductions on mortgage debt. The US subprime mortgage industry grew considerably throughout the 1990s and Wall Street firms began to endorse subprime securitizations. Low interest rates and increasing house prices during this time resulted in rapid expansion of the subprime industry.

Subprime loans increased from 9% of newly originated securitized mortgages in 2001 to 40% in 2006. This subprime boom introduced practices that made it easier to obtain loans, including little or no proof of income or little or no down payment requirements. Two developments also led to the rapid growth of this market: mortgage lenders adopted credit scoring techniques used in making subprime auto loans, and there was a spread of new products offering default protection. Relaxed lending standards and increases in adjustable rate mortgages also contributed to significant growth in this market. In early 2007, lenders began to feel the results of the easing of lending standards as delinquency rates increased sharply and foreclosures reached historic highs. Lenders responded by initially tightening credit standards and many nonbank lenders imposed tougher standards or exited the business.

By August 2007, the housing market's weaknesses became apparent through loan-quality problems, uncertainty about inventories, interest rate changes, and weaker home prices. In addition, many subprime residential mortgage-backed securities were downgraded, leading to a decline in trading for subprime credit instruments. Given the rise and fall of subprime mortgages, it is expected that the housing market's adjustment to more realistic lending standards will prevail into the future. Given the increased level of unsold homes and the expectation that house price appreciation will be minimal in the near future, along with higher rates on many subprime mortgages, foreclosures will likely continue to increase.

Canadian Subprime Market

Subprime lending has seen considerable growth within the Canadian mortgage market. Prior to 2008, there were a large number of subprime lenders in Canada; it was the fastest growing sector of the mortgage market. However, the market share of Canadian subprime mortgages is much smaller than in the US, and since 2008, many of the subprime lenders changed their business or closed.

Differences Between US and Canadian Subprime Market

Canadian mortgage lenders are generally more conservative than their American counterparts. All high-ratio Canadian mortgages must be secured with mortgage insurance and Canadian financial institutions do not lend more than 100% of the purchase price. However, risks do exist in the Canadian market. Declines in Canadian housing prices and increases in interest rates could lead to problems for borrowers. Overall, the risks are lower in Canada since there are fewer subprime loans, tighter restrictions on borrowing, and fewer mortgages using floating rates.

Information Collection

Regardless of whether a prospective purchaser goes through the pre-approval process or chooses to apply for a mortgage after locating a property, the information collection process undertaken by lenders will generally be the same. The first major component of the residential borrower qualification process involves the collection of information about the borrower and the property, i.e., the interest in land. This information is used to estimate the risk on a particular loan and is used in the decision of whether or not to lend. If a decision to lend is made, the information is also used in determining the terms of the mortgage contract, as is discussed in the section on Lending Policy.

Mortgage Loan Application

Established institutional lenders each use their own application forms to collect information from loan applicants and, while some forms may be more detailed than others, the following items are usually included:

Personal Information: The applicants' full names, ages, places of residence, the number and relationship of dependents, and contact information.

Employment Information: The applicants' occupations, employment histories, and income type (salaried, hourly, etc.).

Income Information: Sources and amounts of income, such as employment income, investment income, pension income, rental income, and alimony.

Assets and Liabilities: Assets would include items such as properties owned, vehicles owned, RRSPs and investments, and savings and chequing accounts. Liabilities would include items such as any mortgages currently held, along with the associated property fees, rent, vehicle loans or leases, other loans or lines of credit, and credit card payments.

Mortgage Financing Needs: Allows the applicants to inform the lender of the approximate amount of the mortgage they wish to apply for, the desired length of term, and type of repayment plan.

Characteristics of the Property: A statement of the legal description, address and location, dimensions, and a site plan of the land involved. For new construction, a description of the site, along with plans and details of the cost and type of improvements to be constructed, are required. For properties with existing improvements, a description of the site and improvements, as well as particulars such as the purchase price and estimated value, are given. Any special features, particularly with respect to design, should be noted and the immediate vicinity of the site should be described. The current property taxes, details of the assessed value, a statement of whether or not all taxes have been paid, and particulars of any existing encumbrances on the property are required.

Subsequent Costs Clause: It is unusual for lenders to require an application fee with a residential mortgage loan. However, the applicants usually will be asked to agree that, if the initial application is accepted, they will pay the costs of underwriting, legal, appraisal, credit analysis, title search, and surveyor's fees.

Permission Clause: The applicants generally also agree that the lender may contact persons named as references, as well as other parties (e.g., bankers, employers, and credit bureaus) in the analysis of the applicants' credit ratings.

Privacy Disclosure: The applicants generally authorize the lender to disclose personal and credit information about the applicants to other lenders, credit bureaus, or other credit reporting agencies.

Signature: The applicants' signatures indicate acceptance of the preceding clauses and serve as an indication of serious intent.

After examining the completed form, the lender decides whether or not to accept the application. Generally, rejection of an initial application indicates that the lender is not interested in *any* mortgage with the applicants. On the

other hand, acceptance of the application does not force the lender to provide a loan, or to provide a loan with the requested terms. At this stage, the lender may commit to the interest rate, which will apply *if* the application is approved later.

If both parties wish to proceed, the next steps involve investigation of the applicants' ability to repay (credit analysis) and a valuation of the property (property appraisal). The lender will likely insist that the applicants pay the cost of these investigations whether or not the loan is granted.

Credit Analysis

A *credit analysis* evaluates the applicants' abilities to meet the terms of a mortgage and the amount of their incomes (referred to as debt servicing income) available for future mortgage payments. It documents the applicants' current and expected financial resources, as well as their current and expected financial obligations. By attempting to ensure that the prospective borrowers' total debts do not take too large a portion of their income, the lender tries to reduce the risk of arrears (late payments) or default (no payments) on the loan.

credit analysis
evaluates the applicants' ability to meet the terms of a mortgage and the amount of their income available for future mortgage payments

Credit Report. A *credit report* is a record identifying an applicant's habits regarding their financial commitments. The credit report is created when financial institutions lend funds or provide credit to applicants and proceed to give credit reporting agencies regular information regarding their financial relationships with these applicants. Information, including the date on which accounts were opened, whether payments were on-time or late, and credit balances in terms of credit limits are all reported. This information is important to lenders as it can be used to identify the potential risk of an applicant making overdue payments and/or defaulting on a loan.

credit report
a record identifying an applicant's habits regarding their financial commitments

To gain access to an applicant's credit report, a company must follow the legislation put forth by the provincial and federal government. This generally requires the company to have a legitimate reason and permissible purpose, and

to also have been granted permission from the applicant to review their credit report. The standard is to have an applicant fill out a form that asks for general information such as date of birth and residential address in order to identify the applicant. As well, the form will require the applicant to sign a clause giving permission for the credit grantor to gain access to the applicant's credit report for the life of the account, and in the case of mortgage lenders, for the life of the loan.

Credit reports can be requested from two major bureaus in Canada, TransUnion Canada (*www.transunion.ca*) and Equifax (*www.equifax.ca*). Sample pages from credit reports from TransUnion Canada and Equifax can be found in Figures 12.1 and 12.2, with full size detailed samples found on your Course Resources webpage under Course Materials.

FIGURE 12.1: Sample Pages from TransUnion Credit Report

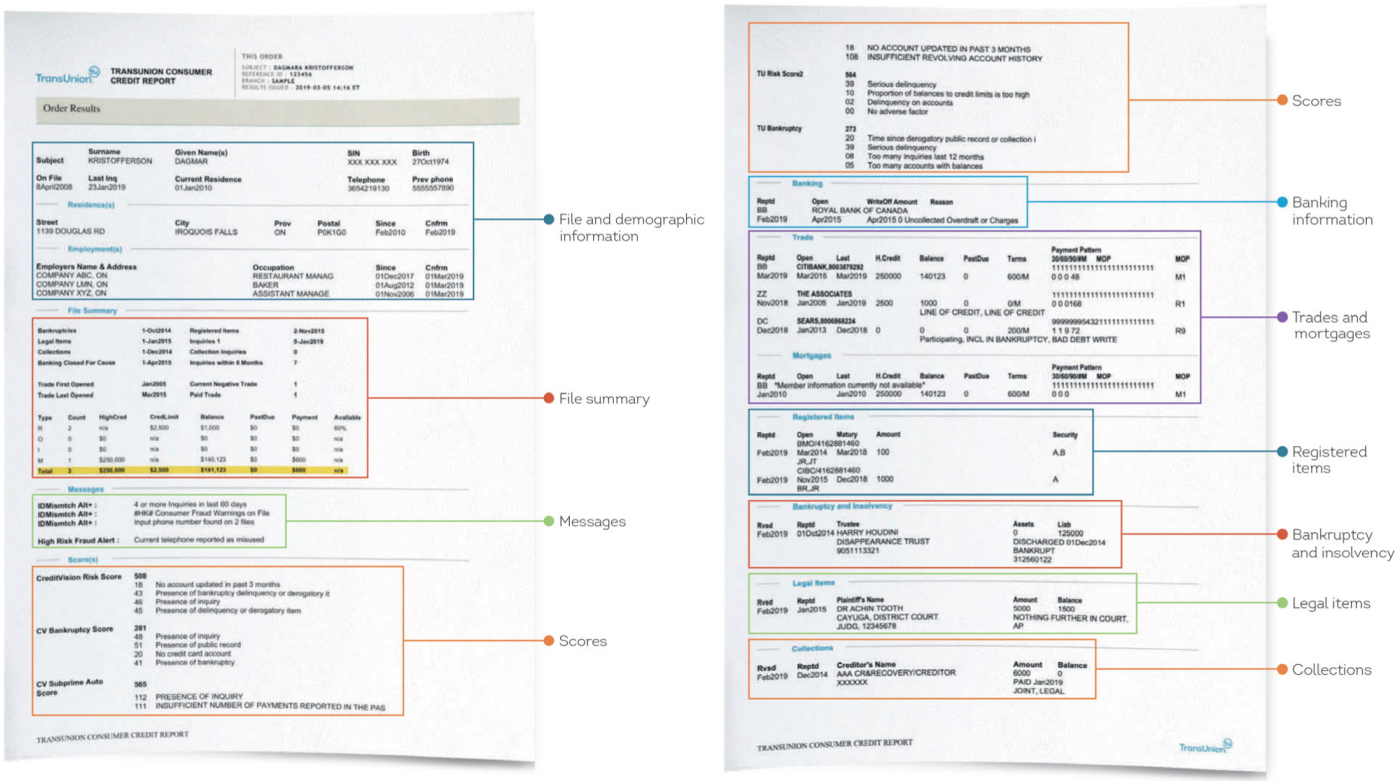
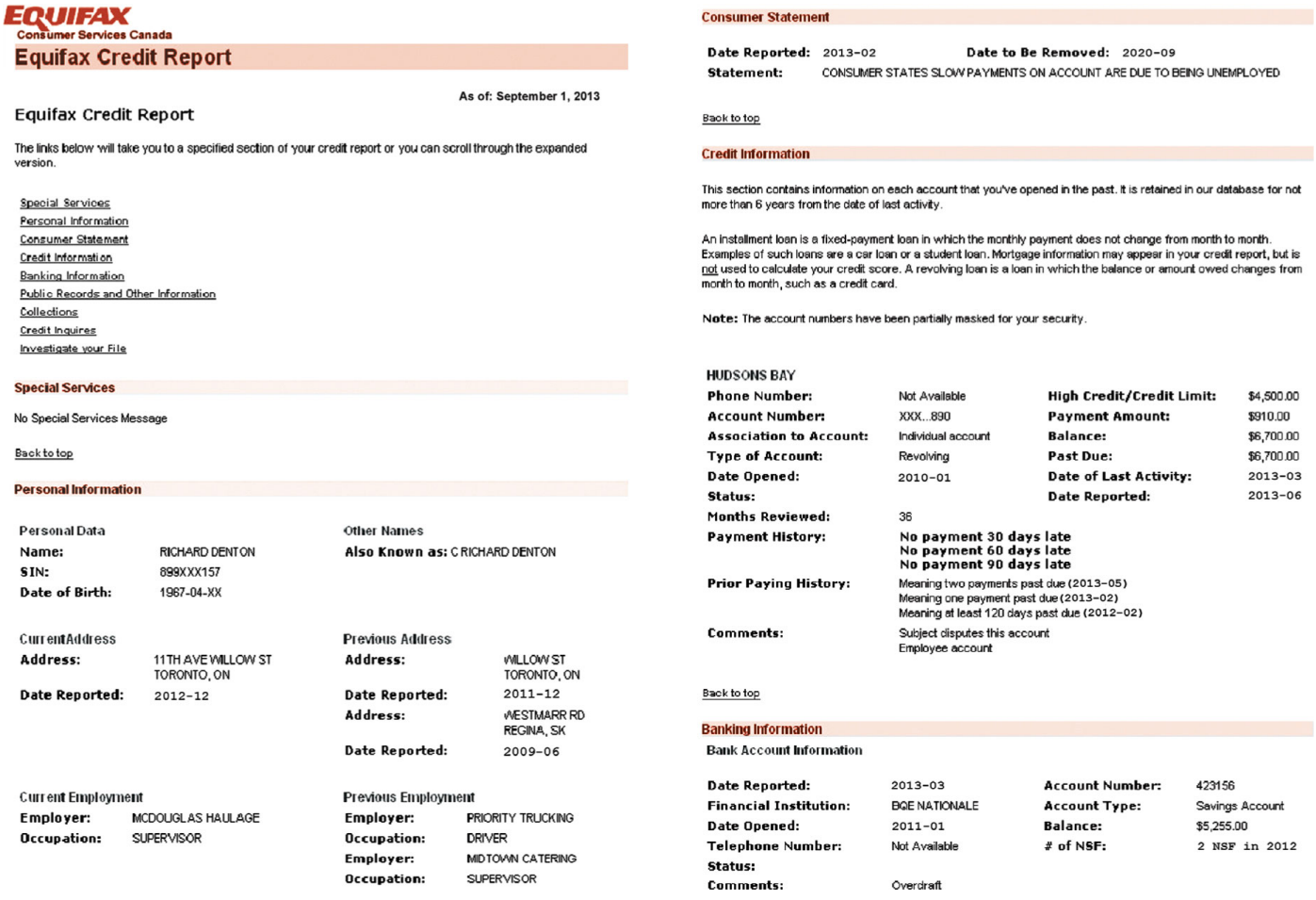


FIGURE 12.2: Sample Pages from Equifax Credit Report



EQUIFAX
Consumer Services Canada

Equifax Credit Report

As of: September 1, 2013

Equifax Credit Report

The links below will take you to a specified section of your credit report or you can scroll through the expanded version.

Special Services
Personal Information
Consumer Statement
Credit Information
Banking Information
Public Records and Other Information
Collections
Credit Inquires
Investigate your File

Special Services

No Special Services Message

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Personal Information

Personal Data

Name:	RICHARD DENTON
SIN:	899XXX157
Date of Birth:	1967-04-XX

Other Names

Also Known as: C RICHARD DENTON

Current Address

Address:	11TH AVE WILLOW ST TORONTO, ON
Date Reported:	2012-12

Previous Address

Address:	WILLOW ST TORONTO, ON
Date Reported:	2011-12
Address:	WESTMARR RD REGINA, SK
Date Reported:	2009-06

Current Employment

Employer:	MCDOUGLAS HAULAGE
Occupation:	SUPERVISOR

Previous Employment

Employer:	PRIORITY TRUCKING
Occupation:	DRIVER
Employer:	MIDTOWN CATERING
Occupation:	SUPERVISOR

Consumer Statement

Date Reported: 2013-02 Date to Be Removed: 2020-09
Statement: CONSUMER STATES SLOW PAYMENTS ON ACCOUNT ARE DUE TO BEING UNEMPLOYED

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Credit Information

This section contains information on each account that you've opened in the past. It is retained in our database for not more than 6 years from the date of last activity.

An installment loan is a fixed-payment loan in which the monthly payment does not change from month to month. Examples of such loans are a car loan or a student loan. Mortgage information may appear in your credit report, but is not used to calculate your credit score. A revolving loan is a loan in which the balance or amount owed changes from month to month, such as a credit card.

Note: The account numbers have been partially masked for your security.

HUDSONS BAY

Phone Number:	Not Available	High Credit/Credit Limit:	$4,500.00
Account Number:	XXX...890	Payment Amount:	$910.00
Association to Account:	Individual account	Balance:	$6,700.00
Type of Account:	Revolving	Past Due:	$6,700.00
Date Opened:	2010-01	Date of Last Activity:	2013-03
Status:		Date Reported:	2013-06
Months Reviewed:	38		
Payment History:	No payment 30 days late No payment 60 days late No payment 90 days late		
Prior Paying History:	Meaning two payments past due (2013-05) Meaning one payment past due (2013-02) Meaning at least 120 days past due (2012-02)		
Comments:	Subject disputes this account Employee account		

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Banking Information

Bank Account Information

Date Reported:	2013-03	Account Number:	423156
Financial Institution:	BQE NATIONALE	Account Type:	Savings Account
Date Opened:	2011-01	Balance:	$5,255.00
Telephone Number:	Not Available	# of NSF:	2 NSF in 2012
Status:			
Comments:	Overdraft		

After receiving a credit report, the most important figure to analyze is the BEACON/FICO (Equifax) or EMPIRICA (TransUnion) score. This is a standardized score given to the applicant which can be used to rank credit worthiness, with low scores indicating a high risk of delinquency. The credit score affects the rate of interest and terms that a borrower may receive. The scores range from 300 to 900 and a score in the high 600 range is generally considered as a good credit rating. A credit score of 750 or above would typically qualify a borrower for the best possible rate and terms. The minimum credit score for a CMHC insured mortgagor is 600 for at least one borrower. If a credit report turns up with a BEACON/FICO/EMPIRICA score of 0, it may mean that the applicant simply has no or very little credit.

Credit scores are based on a formula invented by Fair Isaac Corporation that focuses on previous payment history, current level of debt, number and frequency of new credit enquiries, and the type of credit the borrower has, e.g., credit card, mortgage loan, car loan, student loan, etc. To improve credit scores, borrowers should:

- make payments on time and at least the minimum payment every month;
- make full payments as soon as possible;
- not exceed the credit limit on credit cards and try to keep balances below the limit; and
- reduce the number of credit applications/inquiries from potential lenders.

Along with the BEACON/FICO/EMPIRICA score, the credit report also has other indicators to help easily identify the nature of an applicant's credit history. For example, on some reports, R's are used to identify repayment history for revolving credit, such as credit cards. A scale of R1, meaning that payments were made on time, through to R9, meaning that debt has gone to collection, is used. I's are used to identify instalment loans, such as bank loans. Again, a scale of I1, meaning that payments were made on time, through to I9, meaning that debt has gone to collection, is used. Other issues such as bankruptcy will also be reported on an applicant's credit report.

All aspects of the credit report must be considered; the BEACON/FICO/EMPIRICA score alone may not accurately represent the applicant's credit history. The report should be considered in detail, but some consideration should be given to the fact that it only represents the applicant's past history. As well, it will not reflect any extenuating circumstances that may have influenced the applicant's credit history. Therefore, it is important to discuss with an applicant the information that appears on their credit report. This gives the applicant an opportunity to explain any such circumstances and/or identify any faulty information that may appear on the credit report.

Gross Income. Another critical factor determined during the credit analysis procedure is the figure to be used as the annual gross income of the applicant. Since this figure will be an important determinant of the size of the mortgage loan granted, the lender's policy on gross income can have a significant effect on the applicant. The definition of gross income varies amongst lenders: some lenders use a very narrow definition, using only the principal wage earner's employment income; others use 100% of the principal wage earner's employment income, plus 50 to 100% of secondary wage earner's income;

some will add 50 to 100% of regular investment income. The definition may also change over time due to government programs and/or lenders' policies formulated to control the extent of mortgage lending. When there is a large supply of mortgage funds, lenders use a very generous definition of gross income permitting borrowers to obtain large loan amounts. In times of limited supply of mortgage funds, a much stricter definition of gross income is used, thereby limiting the amount of funds borrowers receive. This is a type of "non-rate rationing" of available mortgage funds, which gives an individual lender some discretion without changing the interest rate from that offered by competitors. However, many mortgage lending programs under the sponsorship of government agencies must specify, in their regulations, the method used to determine gross income. Gross income is typically verified by the submission of a letter of employment stating the potential borrower's gross income, T4s, paystubs, and/or financial statements.

Self-Employed Income. The number of self-employed workers in Canada is steadily increasing; however, those that are self-employed often find it difficult to obtain mortgage financing. As is common with many self-run businesses or fully commissioned salespeople, cash inflows may not be consistent and easy to predict, which in turn can make providing a monthly salary or statement of income difficult.

Major financial institutions have taken note and are widening their product lines to meet the needs of the self-employed and better serve this growing portion of the population. To do this, many institutions introduced a self-employed mortgage, which involves a modified credit approval process.

The Office of the Superintendent of Financial Institutions also requires self-employed workers who are applying for a mortgage or refinancing from a federally-regulated financial institution to have a minimum down payment of 35% of the home price.

Self-employed workers can increase their chances of qualifying for a mortgage or obtaining desired mortgage terms by:[1]

- presenting complete and current financial and tax documents to the lender;
- being up-to-date with income and sales tax returns (and not owing taxes);

- being able to discuss income and expenses of the business; and
- considering incorporating as a business to pay a salary and possibly reduce tax rates.

Rental Income. Rental income is viewed differently depending on whether the mortgage is conventional (uninsured) or high ratio (insured). Generally, if the mortgage is insured, the insurers will allow 100% of the rental income to be added to the applicant's gross income for qualification. If the suite is not legal, CMHC will not allow any income from the suite to be used. The other two insurers, Sagen™ (formerly known as Genworth) and Canada Guaranty, may allow income to be used if it is normal for suites to be illegal in the area.

On a conventional mortgage, there are still some lenders that allow a rental offset. This involves taking a percentage of the rental income, up to 90%, and subtracting it from the mortgage payment. This makes a huge difference in qualifying. In a refinancing situation, many lenders require confirmation of rental income through income tax returns, which creates problems for those who put the cash in their pocket and do not file it with their taxes.

Interview. During this stage of the application procedure, the lender should also interview the applicants to form an opinion of the prospective borrowers, not only as to whether they will make the scheduled payments but also as to whether they will maintain the property in good condition to preserve the value of the security.

Summary. The credit analysis is done to ensure that the borrower has the ability and intention to comply with the mortgage agreement and to ensure that the lender will not have to exercise the various remedies that provide security for a loan. The analysis should enable the loan agreement to be structured such that it can be honoured by both parties. Thus, default will result only if drastic, unexpected changes occur. While a very strict analysis would likely result in few "bad" loans, it might mean that very few loans are made. On the other hand, a weak analysis may result in a large volume of lending activity and many problems for the lender.

Appraisal of the Security: Valuation for Mortgage Lending

The nature of the real property pledged as security for the loan is of great importance in determining the lender's ability to recover the investment if the borrower fails to make the periodic payments agreed to. If the value of the security exceeds the outstanding balance of the loan throughout the full life of the debt, the lender's investment remains protected. Therefore, an accurate appraisal of the property is of equal importance to the investigation of the prospective borrower's credit rating in the lender's decision whether to lend.

The security pledged can be any interest in land; therefore, it is possible to mortgage not only the fee simple interest but also long-term leases and other interests in land. For this chapter, it is not necessary to know the details of a mortgage of a lease, but to realize that other interests in land, besides a fee simple interest, can be pledged as security for a loan. In this course, the valuation of property refers to valuation of interests in land.

An appraiser, reporting to the lender, provides a statement of the current value and possible future trends in value of the subject property. Although lenders' appraisal forms may differ in the amount and extent of details required, each will seek information about the characteristics and value of the property. Any existing liens, encumbrances, covenants, or easements against the property will be described in detail. The form may also require plans for both the site and its improvements to be submitted. Depending on the circumstance during the mortgage underwriting process, mortgage brokers might order and/or review the appraisal report.

The appraiser will generally use the following techniques of appraisal to estimate value: cost approach, direct comparison approach, and, where applicable, income approach.[2] Each method may produce a different estimate of value; the knowledge and expertise of the appraiser will be instrumental in balancing the various estimates obtained to determine the final estimate of *lending value*.

It is important to distinguish between the various terms that are used to measure value in real estate:

a. *Purchase price* is the specific amount that the property will trade for; this is negotiated between the vendor and purchaser. It reflects the unique characteristics of the property and negotiating abilities of the parties involved in the transaction.

purchase price
the specific amount that the property will trade for, as negotiated between the vendor and purchaser

b. *Purchase cost* is the total costs of purchasing a property. It equals the purchase price plus all legal, appraisal, credit analysis, and associated fees, plus any bonus that may be charged on a mortgage. Consequently, the purchase cost will exceed the purchase price.

purchase cost
the total costs of purchasing a property, consisting of the purchase price plus all additional fees and bonuses

c. *Market value* of a property is an estimate of what a property is likely to sell for in an *arm's length transaction* between a willing, informed, and rational average buyer and seller, if the property is on the market for a reasonable period of time when market conditions are unchanged. Market value is determined by standardizing a number of specific, observed transactions to produce an estimate of what the property might sell for in the current market under strictly defined circumstances.

market value
an estimate of what a property is likely to sell for in an arm's length transaction between a willing, informed, and rational average buyer and seller, if the property is on the market for a reasonable period of time when market conditions are unchanged

arm's length transaction
A transaction where the parties act independently and in their own self-interest, with no previous special relationship with each other

d. *Lending value* (or value for mortgage lending purposes) is a long-term, conservative estimate of the value of the property pledged as security for a loan. In forming this estimate, the characteristics of the land, improvements, and surrounding area are all evaluated in detail. Consideration of the area adjacent to the subject property is important since trends prevalent in a neighbourhood exert a major influence on the property's present and future value. Any elements of current market value that are short run or speculative are disregarded, even though they would be considered in the estimation of market value. Consequently, lending value is generally less than market value, sometimes equals

market value, and almost never exceeds market value. To protect the long-run security of the loan, lenders consider each application based on the *lower* value of a property's market value or its lending value. The relationship between these measures of value is indicated by the following example:

Purchase Price	$292,000
Market Value	$290,000
Lending Value	$285,000
Purchase Costs:	
Purchase Price	$292,000
Fees	+ 2,880
Purchase Costs	$294,880

lending value
a long-term, conservative estimate of the value of the property pledged as security for a loan

Where two appraisals of the same residential property differ slightly (e.g., by 3-5%), the lender will use the lower estimate to ensure that the value of the security will always exceed the outstanding balance on the mortgage.

Private Lenders

Established institutional lenders use a more formal application process than private lenders, but since private lenders are arranging a long-term contract with a borrower, they should be just as thorough in underwriting practices.

The application process is very important in vendor financing situations, since vendors will be involved in *two* legal relationships with purchasers:

1. The vendor has sold the property to the purchaser.
2. The vendor has provided the financing for the sale of the property.

The mortgage relationship is the longer lasting. To protect their interests, vendors should be as objective as third-party lenders in the lending decision. In the excitement of receiving an attractive offer with a vendor financing clause, vendors must realize that they will be providing the purchaser with a large amount of money for a long period of time in exchange for this attractive offer. Vendors should obtain the same application information on the prospective

borrower/purchaser and the property as security for a loan that an institutional lender would require in a loan approval.

WARNING: Fraud Detection

Mortgage Professionals Canada has defined mortgage fraud to be any material misstatement, misrepresentation, or omission relied upon by a lender or insurer to underwrite, approve, fund, or insure a mortgage loan. Fraud is becoming an increasing concern for the mortgage industry, which most commonly experiences fraudulent activities involving but not limited to misrepresentation of down payments, forged employment letters or income statements, and forged title registration. Mortgage fraud can often be difficult to detect; however, by exercising due diligence, mortgage brokers help identify situations of fraud. The following are some basic tasks mortgage brokers can carry out to try and reduce the incidence of fraud:

- Analyze documents for inconsistent details
- Request supporting documentation
- Verify borrowers' identities
- Conduct face to face interviews
- Maintain proper documentation and records
- Verify that appraisal is authorized by lender

Source: Mortgage Professionals Canada

Lending Policy

The loan application, credit analysis, and property appraisal provide the lender with two kinds of information:

1. The lender's perception of risk on the loan: does it appear that a contract can be structured in a way that, both initially and over the loan term, will be satisfactory to both parties?
2. The "hard" data about the property and the prospective borrower that will be used to determine specific contract terms. These data provide information used in conjunction with the lender's "rules of lending" or lending policy to determine the financial details of the mortgage contract.

The lender's policy will focus on determining the maximum size of loan that can be supported by the lending value of the property and the applicant's income, given current interest rates.

Loan-to-Value Ratio

Lenders want to ensure that the value of the security will exceed the amount outstanding on the loan if they are forced to exercise their claim against the property; therefore, they limit the loan amount to a maximum of 100% of lending value. In this way, it is expected that the monthly repayments of principal will reduce the outstanding balance at a greater rate than the rate at which property values might decline.

The maximum loan amount is determined by taking a percentage, referred to as the *loan-to-value ratio*, of the lending value. This percentage is set by considering several factors: maximums set by statute for institutional lenders, the lender's general policy, the current availability of mortgage funds, and the risk on the loan.

loan-to-value ratio
the percentage of lending value that determines the maximum loan amount

HELPFUL HINT!

Maximum Loan = Loan-to-Value Ratio Lending Value

For uninsured mortgage loans, the maximum loan-to-value ratio is set by statute as 80% for federally chartered financial institutions. An uninsured mortgage loan, where the lender has only the personal covenant of the borrower and the value of the property as security, is generally referred to as a *conventional mortgage*. Where mortgage insurance is available, either from private or government insurers, a loan-to-value ratio of up to 95% may be used. If a mortgage loan has a loan-to-value ratio of more than 80%, it is known as a *high-ratio or insured mortgage*. The loan-to-value ratio used by private lenders typically varies from 75-90%.

Lenders could greatly reduce their capital risk by setting very low loan-to-value ratios. However, they do not do this for two reasons:

1. Since lenders compete to place mortgage funds, a loan-to-value ratio that is lower than the competitors will drive lending activity to other lenders.

2. A low loan-to-value ratio may force the borrower to also seek junior financing, which is typically at a higher interest rate for a shorter amortization period, thereby increasing the risk of default.

The borrower's equity, or the amount of capital invested exclusive of all mortgages, must be reviewed. The lender considers the borrower's equity to be the margin between outstanding debt and lending value. Borrowers with a large amount of their own money invested in the property will be very concerned with meeting the terms of the mortgage agreement so they do not endanger their equity. Thus, many lenders require that a certain minimum amount of equity be supplied by borrowers. For example, a lender granting an 80% loan-to-value will require that the remaining 20% not be provided by way of a subsequent claim (a second mortgage) on the property.

Private lenders often have small investment portfolios, which make junior mortgages an attractive investment because the size of second and third mortgage loans is usually much smaller than first mortgage loans. However, these loans involve more risk because the lender does not have the first registered charge against the property. Junior lenders must rely on the borrower's equity as the source of security for the loan. The risk of the property value declining faster than the debt is felt first by the holder of the junior mortgage, since the first registered claim must be paid out first in case of default. In this situation, the junior mortgage lender may have to take over the payments on the first mortgage to prevent the first mortgagee from exercising legal remedies and destroying the security for the junior mortgage. Junior mortgage lenders must be particularly concerned with the total loan-to-value ratio on a property.

Prospective purchasers are often overly optimistic about the size of loan they will be granted. They base their estimates on the purchase price and maximum permitted loan-to-value ratio, but the mortgagee may attach a lending value that is less than the sale price and may choose to lend less than the legal maximum.

Both the lending value assigned to a given property *and* the loan-to-value ratio are used to calculate the maximum loan available based on capital security. These two factors are chosen by the lender, subject to the statutory

restrictions. This maximum is used only to define the amount justified by the security.

The lender will then turn to another measure, called the *debt service ratio*, to determine the maximum loan that can be supported by the borrower's income. Once the maximum loan as justified by the lending value of the property *and* the maximum loan as justified by the borrower's income have been determined, the lender will choose the lower amount.

Debt Service Ratios

A lender's primary concern is default. To obtain some protection against default, lenders will generally restrict the loan so that only a specified portion of the mortgagor's income will be needed to repay the mortgage debt. In practice, two ratios are commonly used:

- Gross Debt Service Ratio (GDSR)
- Total Debt Service Ratio (TDSR)

Gross Debt Service Ratio

The *gross debt service ratio* is typically defined as the ratio of the sum of the annual mortgage payments (principal and interest or P+I) and real property taxes (T) to annual gross income (GI). Therefore, the formula is:

$$GDSR = \frac{P + I + T}{GI}$$

where:

P + I represents the annual mortgage payment (*principal plus interest*) made by the borrower

T represents the property taxes made by the borrower

GI represents the annual gross income

gross debt service ratio (GDSR)
the ratio of the sum of the annual mortgage payments and real property taxes (and possibly heating costs, maintenance fees, and registered junior mortgage payments) to annual gross income

However, a lender may also define GDSR to include the annual heating cost and half of any condominium maintenance fees, if applicable:

$$\text{GDSR} = \frac{(\text{P} + \text{I} + \text{T}) + \text{Heat} + \tfrac{1}{2}\,\text{Maintenance Fee}}{\text{Gross Income}}$$

Where the lender feels all debts attributable to the property should be included in the GDSR, including the annual costs of second and subsequent mortgages, the ratio becomes:

$$\text{GDSR} = \frac{(\text{P} + \text{I} + \text{T}) + \text{Heat} + \tfrac{1}{2}\,\text{Maintenance Fee} + \text{Registered Junior Mortgage Payments}}{\text{Gross Income}}$$

A gross debt service ratio of 30% (0.30) means that borrowers will be allowed to use no more than 30% of gross income to pay mortgage payments and real property taxes (and, possibly, heating costs, maintenance fees, or registered junior mortgage payments).

HELPFUL HINT!

For calculation purposes in this course, we will use the first definition of the gross debt service ratio presented, that is:

$$\text{GDSR} = \frac{\text{P} + \text{I} + \text{T}}{\text{GI}}$$

However, the formula may need to be rearranged depending on the information given in the question. For example:

$$\text{GI} = \frac{\text{P} + \text{I} + \text{T}}{\text{GDSR}} \quad \text{OR} \quad \text{P} + \text{I} = (\text{GDSR} \times \text{GI}) - \text{T}$$

Total Debt Service Ratio

The *total debt service ratio* is defined as the ratio of annual payments on all debts (first mortgage, property taxes, maintenance fees, additional financing, car payments, charge accounts, etc.) to annual gross income:

$$\text{TDSR} = \frac{(\text{P} + \text{I} + \text{T}) + \text{Other Payments}}{\text{GI}}$$

total debt service ratio (TDSR)
the ratio of annual payment of all debts to annual gross income; an indicator of the overall indebtedness of the borrower

The total debt service ratio is an indicator of the overall indebtedness of the (potential) mortgagor and includes debts that are ignored in the gross debt

service ratio. A TDSR of approximately 40% is typically used in practice.

Illustration 12.1, Case A: Conventional First Mortgage

The following case reviews gross debt service calculations by a lender who specifies a 30% GDSR and an 80% loan-to-value ratio on an uninsured loan. Assuming a lending value of $225,000, borrower's income of $50,000 per annum, and property taxes of $1,100 per year, calculate the maximum loan if interest rates are 5.5% per annum, compounded semi-annually, and the loan is to be amortized over 20 years with monthly payments. There are two constraints to apply to determine the maximum loan. **The lender will choose the lower loan amount calculated from these two constraints.**

Solution:

1. Loan-to-Value Ratio Constraint

Maximum Loan = Loan-to-Value Ratio × Lending Value

Maximum Loan = 0.80 × $225,000 = $180,000

2. Gross Debt Service Ratio Constraint

$$\text{GDSR} = \frac{P + I + T}{GI} \rightarrow 0.30 = \frac{P + I + \$1{,}100}{\$50{,}000}$$

Recall from the Helpful Hint that you can rearrange the formula to find the annual payment if you have enough information.

P + I = (GDSR × GI)– T

P + I = (0.3 × $50,000)– $1,100

P + I = $13,900 (annual mortgage payment)

Since the loan states that monthly payments are required:

$$\text{Maximum monthly mortgage payment}^{3} = \frac{\$13{,}900}{12} = \$1{,}158.33$$

Monthly payments of $1,158.33 over 20 years at an interest rate of $j_2 = 5.5\%$ will repay a loan of what amount?

Calculation

Press	Display	Comments
5.5 ■ NOM%	5.5	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	5.575625	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	5.438018	Compute nominal rate with monthly compounding
1158.33 +/– PMT	–1,158.33	Enter monthly payment
240 N	240	Enter amortization period
0 FV	0	FV not to be used
PV	169,249.670367	Compute maximum loan amount

3. Summary

Maximum loan amount using loan-to-value ratio constraint = $180,000

Maximum loan amount using gross debt service ratio constraint[4] = $169,249.67

The maximum loan the lender would advance is the *lesser of the amounts* calculated with the two constraints. In this case, the gross debt service ratio constraint is the binding constraint, so the maximum loan the lender would advance is $169,249.67.

Example 12.1

Lindsay Carswell has applied for a mortgage loan to finance a $500,000 home in Gibsons. The Relic Mortgage Co. has supplied the following information:

Lending Value:	$485,000
Loan-to-Value Ratio:	80%
Gross Debt Service Ratio:	30%
Interest Rate:	$j_2 = 6\%$
Amortization Period:	20 years
Payment Terms:	Monthly
Property Taxes:	$1,800 per year

If Lindsay's gross annual income is $100,000 per year, what is the maximum loan that Lindsay can expect to receive from the Relic Mortgage Co.?

Abbreviated Solution:

1. **Loan-to-Value Ratio Constraint**

$$\text{Maximum Loan} = \text{Loan-to-Value Ratio} \times \text{Lending Value}$$

$$\text{Maximum Loan} = 0.80 \times \$485{,}000 = \$388{,}000$$

2. **Gross Debt Service Ratio Constraint**

$$\text{GDSR} = \frac{P + I + T}{GI} \rightarrow 0.30 = \frac{P + I + \$1{,}800}{\$100{,}000}$$

$$P + I = (\text{GDSR} \times GI) - T$$

$$P + I = (0.3 \times \$100{,}000) - \$1{,}800$$

$$P + I = \$28{,}200 \text{ (annual mortgage payment)}$$

Since the loan states that monthly payments are required:

$$\text{Maximum monthly mortgage payment} = \frac{\$28{,}200}{12} = \$2{,}350$$

Monthly payments of $2,350 over 20 years at an interest rate of $j_2 = 6\%$ will repay a loan of what amount?

Calculation

Press	Display
6 ■ NOM%	6
2 ■ P/YR	2
■ EFF%	6.09
12 ■ P/YR	12
■ NOM%	5.926346
2350 +/– PMT	–2,350
240 N	240
0 FV	0
PV	329,968.848372

3. **Summary**

   Maximum loan amount using loan-to-value ratio constraint = $388,000

   Maximum loan amount using gross debt service ratio constraint = $329,968.85

The maximum loan Lindsay will receive is the lesser of the amounts calculated, which in this case is $329,968.85.

The following sections will adjust the financial terms of Illustration 12.1 to determine the effects of these terms on loan amounts.

Adjustments to Financial Terms

Four basic financial elements are used to structure a mortgage loan:

- Amount (face value) of the loan
- Amortization period
- Interest rate

- Payments

For mortgages on owner-occupied residential property, the real property used as security does not generate a cash income. Therefore, once the borrower's annual gross income has been identified, the gross debt service ratio and the loan-to-value ratio serve as the main guidelines to the amount the lender is willing to advance. However, the amount will also be affected by the risk associated with the loan, the annual property taxes, and the mortgage terms such as the interest rate and the amortization period. As discussed in a later section, federally regulated lenders also require that borrowers must qualify for their mortgages subject to a "stress test". The intent of a stress test is to make sure that if interest rates rise, borrowers can handle the payment increase.

Generally, institutional lenders prefer to use the market interest rate for most loans and adjust the non-rate factors of individual loans (the gross debt service ratio and the loan-to-value ratio) to compensate for differing levels of risk. On the other hand, private lenders usually express increased risk with higher contract rates and/or higher effective rates resulting from charging bonuses as additional compensation.

Extending the Amortization Period

Without changing the gross debt service ratio, the amount borrowed can be increased by extending the amortization period. However, lengthening the amortization period slows down the rate of principal repayment; thus, the outstanding debt will be larger at any given time and the lender's risk is higher.

Illustration 12.1, Case B

In Illustration 12.1, Case A, the applicant could only get a $169,249.67 loan, given a gross income of $50,000, an interest rate of $j_2 = 5.5\%$, and a 20-year amortization period. However, the applicant desires a $189,500 loan. If the credit analysis and the characteristics of the property indicate this to be an attractive loan (i.e., low risk), the lender might be willing to extend the amortization beyond 20 years, thereby increasing the amount that could be borrowed without affecting the gross debt service ratio.

Solution:

The extended amortization period is determined as follows:

1. **Calculate the maximum monthly payment**

$$\text{GDSR} = \frac{\text{P + I + T}}{\text{GI}} \rightarrow 0.30 = \frac{\text{P + I + \$1,100}}{\$50{,}000}$$

$$\text{P + I} = (0.3 \times \$50{,}000) - \$1{,}100$$

$$\text{P + I} = \$13{,}900 \text{ (annual mortgage payment)}$$

Since the loan states that monthly mortgage payments are required:

$$\text{Maximum monthly mortgage payment} = \frac{\$13{,}900}{12} = \$1{,}158.33$$

2. **Calculate the amortization period for a rate of j_2 = 5.5% and $189,500 desired loan amount**

Calculation

Press	Display	Comments
5.5 ■ NOM%	5.5	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	5.575625	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	5.438018	Compute nominal rate with monthly compounding
1158.33 +/– PMT	–1,158.33	Enter monthly payment
0 FV	0	FV not used
189500 PV	189,500	Enter desired loan amount
N	299.100294	Compute amortization period in months
÷ 12 =	24.925025	Years to amortize

Extending the amortization period reduces the income needed to service a loan of a given amount. The following table gives the amortization periods and loan amounts given an interest rate of 5.5% per annum, compounded semi-annually, a lender who requires a 30% gross debt service ratio, annual property taxes of $1,100, and a borrower who has $50,000 in annual gross income.

Amortization Period in Years	Loan Amount
20	$169,249.67
25	$189,768.38
30	$205,411.79
35	$217,338.30
40	$226,431.05

NOTE: These amortization periods are used for illustration only. The maximum amortization period allowed is 25 years (insured) or 30-35 years depending on the lender (uninsured with 20% down or more).

To conclude, it is important to recognize that extending the amortization period can increase the loan amount a given income can service.

Reducing the Contractual Term

Typically, lenders are willing to offer borrowers a lower interest rate on borrowed funds if the loan contract is written for a short term (six months to three years) rather than a long term (three years or more) because reducing the time over which funds are committed improves lenders' liquidity. There may be a substantial reduction in the size of the monthly payments required throughout the loan term due to the lower interest rate. However, at the end of the term, the borrower must refinance the outstanding balance and face the risk that interest rates may have risen dramatically. Short-term loan arrangements are most often considered by borrowers when there is an expectation of rising incomes and/or falling interest rates.

Illustration 12.1, Case C

Using Illustration 12.1, assume that lenders are offering mortgage funds with either a 5-year term at 5.5% per annum, compounded semi-annually, or a 1-year term at an interest rate of 5.25% per annum, compounded semi-annually. Since the one-year term loan has a lower interest rate, a borrower will be able to qualify for a larger loan by writing the loan for the shorter term.

Solution:

The maximum allowable loans given a 25-year amortization period, annual gross income of $50,000, a 30% gross debt service ratio, and $1,100 in property taxes are:

Term of Loan	Interest Rate	Maximum Loan
1 year	$j_2 = 5.25\%$	$194,377.41
5 years	$j_2 = 5.5\%$	$189,768.38

By increasing the maximum loan through accepting a shorter term and the lower interest rate, the borrower has:

- an increased degree of risk regarding changes in the interest rate over time. The short-term borrower may end up paying a higher (or a lower) overall five-year rate compared to what would have been paid on a long-term five-year contract. While it is impossible to determine in advance which option will be more expensive, the borrower typically pays a premium for the stability of a longer term, fixed rate.
- the potential to incur another set of transaction costs (e.g., legal, appraisal) when arranging a new loan with another lender. If the borrower is unhappy with the interest rates that the original lender offers in renegotiating the loan at the end of the short term, a new loan with another lender will have to be arranged and transaction costs will result again. This is a risk faced by all mortgagors with partially amortized loans; however, the shorter the term, the more often the risk occurs.

Adding a Second Mortgage

If lenders are unwilling to extend the amortization or reduce the contractual terms, borrowers may obtain additional funds by adding a second mortgage. Borrowers obtain the maximum amount available from the first mortgage lender and apply for a second mortgage from a different lender. However, second mortgages have more risk and, as a result, will have higher interest rates (than first mortgages) and typically have shorter amortization periods.

Illustration 12.1, Case D

In this case, assume that the borrower did receive a first mortgage for $169,249.67. The loan was written at $j_2 = 5.5\%$, with a 20-year amortization and 5-year term. The borrower has annual gross income of $50,000 and annual property taxes of $1,100. Now assume that one year has passed since the

beginning of the first mortgage loan and that the borrower wishes to receive additional financing to perform renovations to the property. The outstanding balance on the loan (OSB_{12}) is $164,434.70, reducing the loan-to-value ratio of the original mortgage to 73.08% ($164,434.70 ÷ $225,000) from 75.22% ($169,249.67 ÷ $225,000). The borrower is still bound by the gross debt service ratio to making maximum first mortgage payments of $1,158.34 per month. Assume that the lending value of the property remains at $225,000.

What is the maximum second mortgage that the borrower can receive to renovate the property, given a maximum loan-to-value ratio of 80%, a total debt service ratio of 40%, and a second mortgage rate of j_2 = 6.75% with a 15-year amortization period?

Solution:

1. Loan-to-Value Ratio Constraint

Maximum Loan = Loan-to-Value Ratio × Lending Value

Maximum combined first and second mortgage loans = 0.80 × $225,000 = $180,000

Maximum second mortgage loan = $180,000 - $164,434.70 = $15,565.30

2. Total Debt Service Constraint

$$\text{TDSR} = \frac{\text{First mortgage payments} + (\text{P} + \text{I} + \text{T})}{\text{GI}}$$

$$\text{P} + \text{I} = (\text{TDSR} \times \text{GI}) - \text{First Mortgage Payments} - \text{Taxes}$$

$$\text{P} + \text{I} = (0.40 \times \$50{,}000) - (\$1{,}158.33 \times 12) - \$1{,}100$$

$$\text{P} + \text{I} = \$5{,}000.04 \text{ (annual mortgage payment)}$$

$$\text{Maximum monthly mortgage payment} = \frac{\$5{,}000.04}{12} = \$416.67$$

Monthly payments of $416.67 over an amortization period of 15 years at an interest rate of j_2 = 6.75% repays a loan of what amount?

Calculation

Press	Display	Comments
6.75 ■ NOM%	6.75	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	6.863906	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	6.65699	Compute nominal rate with monthly compounding
416.67 +/– PMT	–416.67	Enter monthly payment
180 N	180	Enter amortization period
0 FV	0	FV is not to be used
PV	47,361.734004	Compute loan amount under TDSR constraint

3. Summary

Maximum second mortgage using loan-to-value ratio constraint = $15,565.30

Maximum second mortgage using total debt service ratio constraint = $47,361.73

Since the borrower must satisfy both constraints, the maximum second mortgage loan will be $15,565.30; the binding constraint is the loan-to-value ratio. With a second mortgage of $15,565.30, the borrower has total debt equal to 80% of the lending value of the property ($15,565.30 + $164,434.70 = $180,000 = 0.80 × $225,000). The second mortgage enables the borrower to increase the total amount of debt to $180,000, instead of $164,434.70 under the first mortgage alone.

Stress Test

The Office of the Superintendent of Financial Institutions (OSFI) has established a stress test requirement for all new mortgages from federally regulated lenders (e.g., chartered banks, trust and loan companies, and life insurance companies). When introduced in 2016, the qualification applied to all new *insured* mortgages, whereby the borrower was required to qualify at the negotiated contract rate but also at the Bank of Canada's 5-year posted rate. Effective January 1, 2018, the stress test also applies to all *uninsured* mortgages issued by federally regulated financial institutions. Initially, the mortgage qualifying rate, also known as the benchmark qualifying rate or benchmark interest rate, was based on the greater of (1) the 5-year benchmark rate published by the Bank of Canada or (2) an additional 2% above the mortgage's negotiated contract rate. Effective June 1, 2021, the minimum qualifying rate for uninsured and insured

mortgages is the greater of 5.25% or the borrower's contract rate plus 2%, subject to periodic review. Application of the stress test for insured mortgages is provided in the next section.

The stress test for borrowers requires calculating the maximum loan available based on their gross income but using this higher interest rate. This gives some cushion for the impact of rising interest rates, in ensuring that borrowers can still afford their mortgage payments, thus lessening the potential for defaults.

Stress Test

To protect against the risk of interest rate fluctuations, the qualification process for all mortgages from federally-regulated lenders calls for a stress test. This is a further refinement of the gross debt service ratio calculation, to confirm that the borrower's income to service the debt will be adequate even if interest rates rise. This helps protect against mortgage defaults in times of rising interest rates.

Illustration 12.1, Case E

This illustration continues the calculations from Case A of Illustration 12.1 but now also considers the stress test. First, determine the new qualifying interest rate. Assume that the government-specified qualifying rate is $j_2 = 5.25\%$ and the borrower's contract rate is $j_2 = 5.5\%$. The stress test requires adding 2% to the contract rate, resulting in a qualifying rate of $j_2 = 7.5\%$. Since the qualifying rate is greater than the government-specified rate, the rate of $j_2 = 7.5\%$ is used. Then, calculate the maximum loan.

Solution:

Monthly payments of \$1,158.33 over an amortization period of 20 years at an interest rate of $j_2 = 7.5\%$ repays a loan of what amount?

Calculation

Press	Display	Comments
7.5 ■ NOM%	7.5	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	7.640625	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	7.385429	Compute nominal rate with monthly compounding
1158.33 +/– PMT	–1,158.33	Enter monthly payment
240 N	240	Enter amortization period
0 FV	0	FV is not to be used
PV	145,044.69731	Compute maximum loan amount

The calculations are the same as in Case A, except for the new higher interest rate.

The maximum loan amount is $145,044.70. This is approximately $25,000 less than the allowable loan without the stress test. The higher interest rate in the stress test applies a further margin of safety to protect both lenders and borrowers. If interest rates rise during the loan term, this will help ensure that the borrower can still afford the higher payments upon loan renewal.

Stress Test Variations

This illustration had a mortgage loan with an interest rate of 5.5%, so the applicable qualifying rate was 7.5%, based on the rule that it is the greater of either the contract rate plus 2% or the government-specific qualifying rate (5.25% as of June 2021).

- If the mortgage loan's interest rate was 4.5%, then the stress test rate would be that plus 2%, or 6.5%, and the maximum loan would be $156,425.30.
- If the mortgage loan's interest rate was 3%, then the government-specified 5.25% rate would apply, and the maximum loan would be $172,707.00.
- If the loan was from a credit union or another non-federally regulated lender, the stress test doesn't apply (unless the lender chooses to voluntarily impose it). The maximum loan would be $169,249.67 as shown in Case A.

Mortgage Loan Insurance

Like other forms of insurance, mortgage loan insurance provides for reimbursement to the insured in the event of a loss. In this case, the lender is the insured party and is reimbursed if the borrower defaults. In a loan where the lender is insured, the borrower receives the benefit of a higher maximum loan-

to-value ratio or lower interest rate than with an uninsured mortgage. As discussed previously, federally regulated financial institutions require mortgage insurance in order to make loans with loan-to-value ratios higher than 80%.

The Government of Canada's national housing agency, Canada Mortgage and Housing Corporation (CMHC), is one institution that provides mortgage loan insurance. More detailed information about CMHC's mortgage loan insurance program, including insurance rates and terms, can be found on CMHC's website at: *www.cmhc-schl.gc.ca*. Total CMHC-insurance-in-force outstanding has grown significantly from $274 billion in 2005 to over $566 billion. Mortgage insurance is also available from two private companies, Sagen™ (formerly known as Genworth Financial Canada, at *www.sagen.ca*) and Canada Guaranty Mortgage Insurance Company (*www.canadaguaranty.ca*). Total Canadian private mortgage securitization outstanding represents a much smaller segment of the overall market. The information and details provided below pertain specifically to CMHC mortgage loan insurance.

In Canadian mortgage loan insurance, the lender pays the insurer a single premium, the cost of which is generally passed on to the borrower. The borrower either pays the premium in a lump sum payment or, more commonly, adds it to the loan amount and repays it as part of the regular mortgage payment. The amount of the premium is expressed as a percentage of the loan amount, with the percentage increasing with loan risk, as the loan-to-value ratio is increased. Application fees were eliminated in 2006.

Information on specific premiums charged by CMHC is provided in Table 12.1.

Table 12.1: CHMC Mortgage Insurance Premiums

Loan to Value	Premium on Total Loan	Premium on Increase to Loan Amount for Portability
Up to and including 65%	0.6%	0.60%
Up to and including 75%	1.7%	5.90%
Up to and including 80%	2.4%	6.05%
Up to and including 85%	2.8%	6.20%
Up to and including 90%	3.1%	6.25%
Up to and including 95%	4.0%	6.30%

Source: Canada Mortgage and Housing Corporation. (2023). CMHC Mortgage Loan Insurance Costs. www.cmhc-schl.gc.ca

If the premium is added to the loan amount, the amount of the premium is not included in the calculation of the loan-to-value ratio. However, the gross debt service ratio applies to the full amount of the mortgage payments, including the amount which repays the insurance premium. As well, if the premium is added to the loan amount, the full face value of the loan, including the premium, is insured. No additional fees or premiums for loan insurance are charged annually or upon renewal of a mortgage at the end of the term, even though the insurance is in force for the full amortization period.

If a borrower defaults on an insured mortgage loan, the lender begins the legal process of foreclosure and makes a claim against the borrower on the borrower's personal covenant. Also, the lender makes a claim with the insurer. Once the Order for Sale[5] is granted at the end of the redemption period, the lender lists the property for sale. If the sale proceeds are insufficient to repay the mortgage balance, the insurer pays the lender the difference. At that time, the lender assigns the personal claim against the borrower to the insurer.

Underwriting Insured Mortgage Loans

Lender Qualification

Both the public and private mortgage loan insurers accept applications for loan insurance only from lenders deemed eligible through the screening process.

Thus, the underwriting process begins with the issuance of approved lender status to qualified lenders.

Companies eligible for acceptance include banks, loan, insurance, trust and other companies or corporations, trustees of trust funds, credit unions, and other co-operative societies. Eligibility for acceptance means that the companies are authorized to lend money on the security of real or immovable property, that they have a minimum of $500,000 in unimpaired capital, and are incorporated federally or provincially. They must also demonstrate that they have the resources and administrative practices in place to originate mortgages that follow the policies and procedures of the *National Housing Act* and *National Housing Loan Regulation* or the private insurer's policies and procedures. A complete list of approved lenders is available on the CMHC website at *www.cmhc-schl.gc.ca.*

The lender's application is reviewed to ensure the company has the necessary financial strength and lending expertise to be an approved lender. Approved lenders can originate their own loans or designate another lending organization to act as an agent for them if, for example, they do not have a branch organization. Such designated organizations are known as approved correspondents.

The approved lender examines a mortgage loan application that it is considering insuring using generally accepted and prudent lending practices and adherence to their company policies. The mortgage loan insurance companies provide the approved lender with a comprehensive handbook that describes the lender's policies and procedures. The lender, after ensuring that certain basic criteria stipulated by the insurer are met (e.g., maximum gross debt service level), submits a request for insurance. This request is a package of information containing all pertinent loan details including credit analysis results.

Borrower Qualification

In the underwriting process, the lenders are responsible for verifying that the borrower's characteristics are suitable to the risk associated with the financing obligations. The insurer takes this and other pertinent information into account to establish the underwriting risk.

It should be noted that self-employed borrowers with more than three years in the same business and commissioned-income borrowers are required to provide third-party validation (financial statements, contracts, T4s, etc.) of income to qualify for CMHC's self-employed mortgage product.

If an approved lender accepts the initial application, it then proceeds with the detailed credit analysis, working with an estimate of the lending value of the property. If unable to determine a sufficiently accurate estimate of value for these preliminary purposes, the lender may ask CMHC to quote estimates of the lending value and the amount of the loan that the Corporation is prepared to insure (the lender submits the "Request for Loan Amount" form to CMHC). The lender may then consider this amount, or a lower one, as its estimate. If, after the results of these investigations have been examined, the lender is willing to make the loan, it then forwards to CMHC a "Request to Undertake Insurance" form that lists all of the details pertinent to the loan (credit analysis results, description and plans of property and improvements). After the Corporation has examined these documents and determined the lending value, it decides whether or not it is willing to insure the loan. To qualify for an insured mortgage, regardless of the type of mortgage and actual interest rate and term of their particular loan, all borrowers are required to meet the stress test standards at the qualifying rate. If the Corporation is willing, it will send back to the lender its "notice of undertaking to insure", a document stating the Corporation's commitment to provide insurance, and the details about the lending value and amount of loan.

At this point, the lender will, after further discussion with the applicant, decide whether or not it will make the loan. If the decision is positive, the mortgage document is prepared. The mortgage document is very similar to that used in the conventional market, except that it is subject to certain maximums and specifics prescribed by the *National Housing Act* and *Regulations*. Thus, it is necessary to consider the financial and other aspects of the mortgage document.

If the loan is advanced in instalments, the instalments may be insured. Alternatively, the insurance can be designed to take effect only after the loan is fully advanced.

CMHC requires that builders of new homes, for which mortgage loan insurance is being sought, be registered in a new home warranty program and that the house is enrolled in this warranty program (e.g., the New Home

Warranty Program of British Columbia and the Yukon). There are several programs across the country that require builders to apply to become members, showing they have adequate technical qualifications and financial resources.

To avoid duplication of effort, CMHC takes a secondary role in inspection and appraisal, allowing the services provided by municipalities to be used in the application process. However, in areas where inspection and appraisal services are unavailable, CMHC will carry out the necessary review and be responsible for providing progress advance examinations for a higher application fee. Thus, lenders are not required to employ an appraisal staff in order to participate. The introduction of the emili automated underwriting system in the 1990s has further lessened the requirement for appraisals.

The specific policies of the insurers regarding loan-to-value ratios, terms, amortization periods, GDS ratios, interest rates, eligible property and income, and payment of property taxes usually reflect the typical market practices used for uninsured loans.

Maximum Loan-to-Value

The amount of the loan is determined by a loan-to-value formula until a maximum amount is reached. The initial program limitations were applicable in 1954:

- for new home ownership loans: 90% on first $8,000, plus 70% on remainder of lending value, maximum loan $12,800;
- for loans on new rental accommodation: 80% of lending value, maximum loan $7,000 per unit for multi-family dwelling;
- for conversion of existing units: the lesser of 70% of lending value of completed structure, or the cost of alterations and the amount required to retire existing encumbrances on the property; and
- for purchase of existing units (commencing in 1966) for owner occupancy: 95% of lending value, maximum of $10,000.

These maximums and ratios have changed significantly since 1954. In 1987, the loan to value provisions included:

- no maximum loan amount; and

- loan-to-value maximum of 90% of first $125,000 lending value, plus 80% of balance.

The maximum loan under the mortgage loan insurance program is 95% of lending value for owner-occupied residential homes, subject to limitations on the number of units in the dwelling and the purchase price. When the loan-to-value ratio is greater than 80%, the maximum purchase price or as-improved value of the property must be below $1 million. In 2012, a new mortgage insurance rule was implemented for refinancing an existing mortgage. This rule reduces the maximum amount that can be withdrawn when refinancing a mortgage to 80%, down from the previous 85%, of the home's value.

Effective late 2016, the government imposed new restrictions on when it will provide insurance for low-ratio mortgages, a situation where a borrower applies for an insured mortgage and has more than 20% for a down payment. The new rules restrict insurance for these types of mortgages based on new criteria, including that the amortization period must be 25 years or less, the purchase price is less than $1 million, the buyer has a credit score of 600, and the property will be owner-occupied.

For a new mortgage on an owner-occupied residential home, borrowers typically should have a down payment of at least 5% of the purchase price of the dwelling, depending on the dwelling type (single-family and two-unit dwellings are subject to a 5% minimum down payment for a house priced up to $500,000, and three or four-unit dwellings are subject to a 10% minimum down payment). In addition, in 2016, the minimum down payment for new insured mortgages increased from 5% to 10% for the portion of a house price above $500,000. The 5% minimum down payment for properties up to $500,000 remains unchanged. For a non-owner-occupied property, the minimum down payment required is 20%.

Normally, the minimum down payment comes from the borrower's own resources and is treated as a traditional source of payment. Traditional sources of down payment include:

- applicant's savings;
- RRSP withdrawal;
- funds borrowed against proven assets;

- sweat equity (<50% of minimum required equity, allow owner's labour on own property to count as equity);
- land unencumbered;
- proceeds from sale of another property;
- non-repayable gift from immediate relatives; or
- equity grant (non-repayable from federal, provincial, or municipal agency).

Non-traditional sources of down payment consist of any source that is arm's length to and not tied to the purchase or sale of the property, such as borrowed funds, gifts, 100% sweat equity, and lender cash back incentives. Effective July 2020, CMHC has eliminated non-traditional sources of down payment.

Maximum Debt Service Ratios

The maximum gross debt service ratio (GDSR) is 39% for owner-occupied single-family units and the maximum total debt service ratio (TDSR) is 44%. A maximum GDSR of 39% means that only 39% of gross family income can be used to repay principal, interest, taxes, heating and, if applicable, 50% of condominium fees or ground rental payments. A maximum TDSR of 44% means that only 44% of gross family income can be used to repay all the same items as the GDSR plus other debts such as car payments, credit card payments, or student loan payments.

In the 1954 *National Housing Act*, income used to determine the gross debt service ratio was defined as "the husband's annual income plus one half of the wife's annual income plus the annual amount of any other regular income (including rental on the other half of duplex structures)". Since 1972, the regulations provided that either partner may be considered the home-owner or home purchaser, the choice being the prerogative of the borrower. Also, the gross income is calculated based on the amount of the purchaser's income plus the amount of the purchaser's spousal income plus any other income (includes rental income and investment income). Parenthetically, the *National Housing Act* prohibits discrimination against any person for reasons of race, colour, religion, place of origin, gender, or marital status.

As mentioned previously, the Office of the Superintendent of Financial Institutions established a stress test requirement for all new insured mortgages – including those where the borrower has more than 20% for a down payment. The stress test for borrowers means calculating the maximum loan available based on their gross income but using this higher interest rate.

Maximum Amortization Period

Under the initial terms of the 1954 legislation, borrowers had the right to a minimum of a 25-year term and amortization period that, with the consent of the lender, could be extended to 30 years. In 1969, the lending regulations were changed to permit renegotiation of mortgage agreements during the life of the debt as an alternative to fixed interest rate mortgages (e.g., five-year call option or term). In 1980, new construction and existing housing for home ownership, rental, and co-operative housing qualified for this arrangement where lenders may write mortgages having a term of 5 years and a maximum amortization period of 30 years for home ownership housing and 35 years for rental housing.

For owner-occupied single-family units, the maximum amortization period for loans with a loan-to-value ratio greater than 80% is 25 years. For multi-unit rental properties, the typical amortization is a maximum of 25 years and could be as long as 35 years with a surcharge (with CMHC's approval).

Interest Rate Limitations

Under the 1954 *National Housing Act*, the interest rate was originally established periodically by the Governor-in-Council in such a manner that the rate at the time of prescription was not to exceed the 20-year government bond rate by more than 2.25%. This statutory setting of a maximum rate contrasted with the previous practice of the specific rate being set and fixed by negotiation between the Corporation and the lenders. When the conventional rate for mortgages exceeded that allowed under the Act, lenders restricted their activities with respect to government insured loans. The *National Housing Act* was amended in 1969 and rates on mortgages given under the *National Housing Act* were free to find their own level, allowing approved lenders to obtain competitive yields on these investments.

With the imposition of a stress test in 2016, the qualifying interest rate used to assess borrower eligibility for all new insured mortgages was the greater of the

Bank of Canada's 5-year fixed posted mortgage rate or an additional 2% above the negotiated contract rate. Effective June 1, 2021, the minimum qualifying rate for insured mortgages is the greater of 5.25% or the borrower's contract rate plus 2%.

Administering and Selling Insured Mortgage Loans

Insured mortgage loans are to be serviced by an approved lender. Insured mortgages can be sold or responsibility for administration can be transferred without charge, and the insurance remains valid provided that servicing by an approved lender continues. Since many approved lenders service mortgages on behalf of others in exchange for an administration fee, institutions can originate, or invest in, insured mortgage loans without establishing mortgage administration operations.

Home owner loans approved by CMHC since 1996 include a portability feature. As long as all of CMHC's portability criteria are met, this feature allows the outstanding balance of an insured loan to be transferred to a different property, with no additional premium being charged.

The insurer does not become involved in the lender's day-to-day administration of insured mortgage loans, but it does require that good business practice, as well as certain specific policies be followed. The insurer must be notified of any changes in ownership or administration.

The following example illustrates the calculations involved in borrower qualification for an insured mortgage.

Illustration 12.2

A borrower is considering the purchase of a home under CMHC's mortgage loan insurance program and approaches a lender about financing. The borrower has annual gross income of $100,000 but has only saved 5% of the purchase price for a down payment. The home under consideration is appraised by the lender at a lending value of $325,000, with property taxes of $2,500 per year. The lender has set the maximum loan at 95% of the lending value on an insured loan, with interest at $j_2 = 2.75\%$, a 25-year amortization period, monthly payments, and a 5-year term. The insurer requires a premium of 4% of the loan amount for loan-to-value ratios up to 95%. The lender also

requires a GDSR constraint of 39%. The borrower wishes to add the insurance premium to the loan amount.

What is the largest loan the borrower can receive?

Solution:

1. Loan-to-Value Ratio Constraint

Maximum Loan = Loan-to-Value Ratio × Lending Value

Maximum Loan = 0.95 × $325,000

Maximum Loan = $308,750

Maximum loan the borrower would receive under loan-to-value ratio constraint = $308,750

Face value of loan including insurance premium = $308,750 + (0.04 × $308,750)

Face value of loan including insurance premium = $321,100

2. Gross Debt Service Constraint

$$\text{GDSR} = \frac{\text{P+I+T}}{\text{GI}} \rightarrow 0.39 = \frac{\text{P+I+\$2,500}}{\$100,000}$$

P+I = (GDSR × GI) – Taxes

P+I = (0.39 × $100,000) – $2,500

P+I = $36,500 (annual mortgage payment)

Since the loan requires monthly payments:

$$\text{Maximum monthly payment} = \frac{\$36,500}{12} = \$3,041.67$$

Monthly payments of $3,041.67 at j_2 = 2.75% for 25 years will repay what amount?

Calculation

Press	Display	Comments
2.75 ■ NOM%	2.75	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	2.768906	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	2.734376	Equivalent j_{12} rate
3041.67 +/– PMT	–3,041.67	Enter monthly payment
300 N	300	Enter amortization period in months
0 FV	0	FV is not to be used
PV	660,498.227996	Maximum face value under GDSR constraint

However, this loan is also subject to the stress test constraint. Assuming the minimum qualifying rate is 5.25% per annum, compounded semi-annually, what is the maximum loan under the gross debt service ratio?

Calculation (continued)

Press	Display	Comments
5.25 NOM%	5.25	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	5.318906	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
NOM%	5.193482	Equivalent j_{12} rate
PV	510,417.524996	Maximum face value under GDSR constraint

The maximum loan face value under the GDSR constraint, with the stress test considered, is $510,417.52. This amount includes the loan amount to the borrower and the insurance premium (which is 4% of the loan to the borrower). The amount the borrower receives would be calculated as follows:

Face Value = Loan to Borrower + Insurance Premium

Face Value = Loan to Borrower + 4% of Loan to Borrower

Face Value = (1 + 0.04) × Loan to Borrower

$$\text{Loan to Borrower} = \frac{\text{Face Value}}{1.04} = \frac{\$510{,}417.52}{1.04} = \$490{,}786.08$$

3. Summary

Maximum loan amount to the borrower under loan-to-value ratio constraint = $308,750

Maximum loan amount to the borrower under gross debt service ratio constraint = $490,786

The maximum loan to the borrower would be $308,750, the amount calculated under the loan-to-value ratio constraint. The amount the borrower would have to repay would be the amount calculated under the loan-to-value ratio constraint, plus the insurance premium, an amount of $321,100. The periodic mortgage payments would be based on the face value of $321,100.

The residential mortgage underwriting procedures outlined above determine the amount a lender is prepared to lend to applicants. A borrower who does not find the lender's offer acceptable may make a counter proposal or seek an alternative source of financing. The different loan amounts that are obtainable under conventional and insured loans indicate the effects of different underwriting policies.

Illustration 12.3

Clients have contacted you to help arrange a mortgage. They have used an online mortgage calculator to calculate the maximum loan they can qualify for, based on the following assumptions:

- 25-year amortization and monthly payments
- Current 5-year rate of 4% per annum, compounded semi-annually
- Annual property taxes are estimated at $3,600 (assume no other debts and no heating costs are considered)[6]
- 35% GDSR
- Annual gross income of $55,000
- Down payment of $50,000, with loan-to-value (LTV) requirements of 5% on the first $500,000 of the home's purchase price and 10% on the remaining balance

Your clients have determined that they qualify for a maximum loan of $241,179 and a maximum house purchase price of $291,179. However, they are not aware of the stress test, which is based on the greater of the government-specified qualifying rate of $j_2 = 5.25\%$ or an additional 2% above the negotiated contract rate. You need to advise your clients on how much they can borrow and ultimately afford to offer to purchase a house.

Solution:

1. Loan-to-Value Ratio Constraint/Maximum House Price

Federal rules stipulate that home buyers must put down at least 5% on the first $500,000 of the home's purchase price and 10% on the remaining balance. The maximum house price under the loan-to-value constraint is $750,000.

($500,000 × 0.05) + [(House Price – $500,000) × 0.10] = $50,000

$25,000 + (0.10 × House Price) – $50,000 = $50,000

$25,000 + (0.10 × House Price) = $100,000

0.10 × House Price = $75,000

$$\text{House Price} = \frac{\$75{,}000}{0.10} = \$750{,}000$$

Maximum Loan = $750,000 – $50,000 = $700,000

2. Gross Debt Service Ratio Constraint

$$\text{GDSR} = \frac{P + I + T}{GI} \rightarrow 0.35 = \frac{P + I + \$3{,}600}{\$55{,}000}$$

P + I = (GDSR × GI) – T

P + I = (0.35 × $55,000) – $3,600

P + I = $15,650 (annual mortgage payment)

Since the loan states that monthly payments are required:

$$\text{Maximum monthly mortgage payment} = \frac{\$15{,}650}{12} = \$1{,}304.17$$

First, verify that your client's calculations were correct. At the interest rate of 4% per annum, compounded semi-annually, the clients would qualify for a mortgage of $247,931.54, before accounting for insurance fees. This is an 83.2% loan-to-value ratio[7] ($247,931.54 ÷ $297,931.54). Referring to Table 12.1, this loan requires an insurance fee of 2.8%. With the fee factored into the calculation, the maximum loan under the gross debt service ratio is $241,179 ($247,931.54 ÷ 1.028). Adding the $50,000 down payment gives a maximum purchase price of $291,179.

Calculation

Press	Display	Comments
4 ■ NOM%	4	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	4.04	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	3.967068	Compute nominal rate with monthly compounding
1304.17 +/– PMT	–1,304.17	Enter monthly payment
300 N	300	Enter amortization period
0 FV	0	FV not to be used
PV	247,931.540819	Compute maximum loan amount
÷ 1.028 =	241,178.541653	83.2% LTV incurs 2.8% insurance fee

With the stress test in mind, you would apply a rate of j_2 = 6%, the borrower's contract rate plus 2%, which is greater than the government-specified rate of j_2 = 5.25%.

Calculation

Press	Display	Comments
6 ■ NOM%	6	Enter stated nominal rate
2 ■ P/YR	2	Enter stated compounding frequency
■ EFF%	6.09	Compute equivalent effective annual rate
12 ■ P/YR	12	Enter desired compounding frequency
■ NOM%	5.926346	Compute nominal rate with monthly compounding
1304.17 +/– PMT	–1,304.17	Enter monthly payment
300 N	300	Enter amortization period
0 FV	0	FV not to be used
PV	203,838.152301	Compute maximum loan amount
÷ 1.028 =	198,286.140371	80.3% LTV ($203,838.15 ÷ $253,838.15)

Under the stress test rules, monthly payments of $1,304.17 over 25 years at an interest rate of j_2 = 6%, with a 2.8% insurance fee accounted for, will repay a loan of $198,286. Adding the down payment of $50,000 produces a maximum purchase price of $248,286. Since the maximum loan under the income constraint is less than the maximum loan under the loan-to-value constraint, the maximum purchase price is $248,286.

You explain to your clients that this lower purchase price reflects a more conservative, safer lending scenario, in effect protecting this real estate

purchase from the risk of rising interest rates. You also explain ways that the clients may potentially qualify for a larger purchase price:

- Reduce the mortgage loan required by increasing the down payment
- Increase income by adding a co-borrower to the application
- Obtain a mortgage that is not affected by the stress test and insurance regulations, e.g., borrow from a non-federally regulated lender such as a credit union – although this may result in a higher interest rate

Further Scenarios: The following table summarizes the results of three additional scenarios where the buyer's income and down payment amounts vary (with the initial example set as Scenario A). This highlights the impact of the stress test on both maximum loan amounts and potential purchase prices. The results illustrate how the stress test limits both the loan amount and potential purchase prices, especially for lower incomes and higher-ratio loans. This illustration emphasizes how the stress test requirement reduces the likelihood of mortgage default should interest rates rise.

Scenario	Annual Gross Income	Down Payment	Maximum Loan		Maximum Purchase Price	
			Market Rate 4%	Stress Test 6%	Market Rate 4%	Stress Test 6%
A	$55,000	$50,000	$241,179	$198,286	$291,179	$248,286
B	$125,000	$50,000	$611,601	$502,831	$661,601	$552,831
C	$158,000	$50,000	$700,000	$647,481	$750,000	$697,481
D	$140,000	$90,000	$697,611	$573,544	$787,611	$663,544

Scenario B: Assume an annual gross income of $125,000 and a down payment of $50,000

Since the calculations are very similar to Scenario A (original Illustration 12.3), only the results are provided.

1. Loan-to-Value Ratio Constraint/Maximum House Price

$750,000 as per calculation in Scenario A.

2. Gross Debt Service Ratio Constraint

$$\text{Maximum monthly mortgage payment} = \frac{\$40{,}150}{12} = \$3{,}345.83$$

Under stress test rules, with monthly payments of $3,345.83 over 25 years at an interest rate of $j_2 = 6\%$, your clients would qualify for a mortgage of $522,943.95, before accounting for insurance fees. This is a 91.3% LTV. From Table 12.1, this loan requires an insurance fee of 4%. With the fee factored into the calculation, the maximum loan under the GDSR is $502,831. Adding the down payment of $50,000 produces a maximum purchase price of $552,831. Since the maximum loan under the income constraint is less than the maximum loan under the loan-to-value constraint, the maximum purchase price is $552,831. Without the stress test, the 4% interest rate would result in a maximum loan of $611,601 ($636,064.92 ÷ 1.04) and a purchase price of $661,601.

Scenario C: Assume an annual gross income of $158,000 and a down payment of $50,000

1. **Loan-to-Value Ratio Constraint/Maximum House Price**

   $750,000 as per calculation in Scenario A.

2. **Gross Debt Service Ratio Constraint**

$$\text{Maximum monthly mortgage payment} = \frac{\$51{,}700}{12} = \$4{,}308.33$$

Under stress test rules, with monthly payments of $4,308.33 over 25 years at an interest rate of $j_2 = 6\%$, your clients would qualify for a mortgage of $673,380.02, before accounting for insurance fees. This is a 93.1% LTV, resulting in a 4% insurance premium. With the fee factored into the calculation, the maximum loan under the GDSR is $647,481. Adding the down payment of $50,000 produces a maximum purchase price of $697,481. Since the maximum loan under the income constraint is less than the maximum loan under the loan-to-value constraint, the maximum purchase price is $697,481. Without the stress test, the 4% interest rate would result in a maximum loan of $787,541 ($819,042.68 ÷ 1.04) under the GDSR constraint. This means that the loan-to-value constraint is binding, for a maximum loan of $700,000 and purchase price of $750,000.

Scenario D: Assume an annual gross income of $140,000 and a down payment of $90,000

1. **Loan-to-Value Ratio Constraint/Maximum House Price**

With a down payment of $90,000, the borrowers qualify for a house price of $1,150,000. However, properties with a sale price of $1 million and above require a minimum down payment of 20%. Since the borrowers do not have $200,000 for a 20% down payment on a $1,000,000 purchase, the maximum house price under the loan-to-value constraint is $999,999.

$($500,000 \times 0.05) + [(\text{House Price} - \$500,000) \times 0.10] = \$90,000$

$\$25,000 + (0.10 \times \text{House Price}) - \$50,000 = \$90,000$

$\$25,000 + (0.10 \times \text{House Price}) = \$140,000$

$0.10 \times \text{House Price} = \$115,000$

$\text{House Price} = \$1,150,000$

2. Gross Debt Service Ratio Constraint

$$\text{Maximum monthly mortgage payment} = \frac{\$45,400}{12} = \$3,783.33$$

Under stress test rules, with monthly payments of $3,783.33 over 25 years at an interest rate of $j_2 = 6\%$, your clients would qualify for a mortgage of $591,323.98, before accounting for insurance fees. This is an 86.8% loan-to-value, resulting in a 3.1% insurance premium. With the fee factored into the calculation, the maximum loan under the GDSR is $573,544. Adding the down payment of $90,000 produces a maximum purchase price of $663,544. Since the maximum loan under the income constraint is less than the maximum loan under the loan-to-value constraint, the maximum purchase price is $663,544. Without the stress test, the 4% interest rate would result in a maximum loan of $697,611 ($719,236.63 ÷ 1.031) under the GDSR constraint, with a maximum purchase price of $787,611.

COMMERCIAL MORTGAGE LOAN UNDERWRITING

Role of Financing in Commercial Real Estate Markets

As the financial benefits flowing from an interest in real property are generally long-lasting, the capital (present) values of such assets are generally high. Given large price tags, many prospective purchasers find investment in income-producing properties prohibitively expensive if provisions for debt financing cannot be arranged. Combining credit with equity either permits the purchase of larger assets, or advances the time when investors can purchase. The time

required to save a sufficient amount to allow for an all-cash purchase might never be realized. The net effect of debt financing, in this context, is best represented by an advance of "compulsory future savings" to be combined with savings (equity) available at the time of purchase. After funds are advanced, the borrower is obligated to repay the borrowed capital by devoting an appropriate portion of the property income to loan repayment.

However, it must be noted that the current extensive use of credit includes purposes other than the extension of the limited savings (equity) of purchasers of an interest in land. For example, many investors in income-producing properties find it financially advantageous to borrow a part of the required capital even though their own funds might be sufficient. There are several reasons that might lead to such borrowing:

- To diversify investments and reduce overall risk, it may be advisable to commit only a part of available funds to any one enterprise.
- When it is possible to borrow at an interest rate lower than the expected productivity of the enterprise. In these cases, the greater the debt, the higher will be the anticipated rate of return on invested equity capital (and of course, the greater the risk). This is called financial leverage or trading on the equity.
- The investor anticipates an increase in the general price level (inflation) and in the returns on real estate. In an inflationary environment, the purchase of property today with the use of debt financing may increase investment yields as the payments on the loan are fixed and the investor hopes to pay off the debt in "cheaper" (inflated) dollars.
- An investor may use debt financing to save or release equity for other activities, e.g., a merchandising or manufacturing concern may prefer to use available funds in a business rather than to invest it in land and buildings.

Notice that many of these reasons for borrowing are equally applicable in the context of both acquisitions and use of financing by parties who already own interests in land. For these (and other) reasons, the capital to acquire or maintain ownership of an interest in land is usually provided in part by the owner and in part by the lender.

The previous section dealt exclusively with owner-occupied residential mortgage underwriting. While lending practice with respect to owner-occupied residential property tends to be relatively uniform amongst mortgage lenders, the same cannot be said for commercial mortgage lending. There are several reasons why commercial lending activities are less uniform than residential lending activities. These include the following:

- The properties used as security on the loan are much more diverse and unique in their characteristics. This heterogeneity (as compared to the relative homogeneity in the owner-occupied market) alone accounts for much of the diversity in commercial underwriting practice.
- The nature of the covenant to pay on commercial loans – the income on the property and the financial capacity of the commercial borrower – are much more diverse than the gross income used in residential underwriting.
- The large size of commercial loans, in terms of both absolute dollars and percentage of a lender's portfolio, requires much more careful, detailed, and specific analysis of commercial loan applications than occurs on residential applications.
- Commercial borrowers are generally more sophisticated with respect to financing than are typical residential borrowers. As a result, they may require and accept a greater diversity of financial arrangements than would be appropriate in the residential market.

These points indicate why commercial or income property loans are less uniform and more a matter of negotiation between lender and borrower. However, many of the basic aspects of lending procedure are similar both within the commercial market, and between the residential and commercial markets.

The following sections outline the significant elements of the commercial underwriting process. Only those elements that differ from residential underwriting will be emphasized. The overall structure of the underwriting process – application, analysis of the income and security, negotiation, and loan approval – is similar between residential and commercial lending. Thus, the discussion of commercial analysis will commence with the credit application.

Commercial Properties Defined

Commercial real property encompasses all income-producing assets, also known as revenue-generating properties. This category includes single-family residential dwellings that are not owner occupied, multi-family residential that is not owner occupied, industrial and manufacturing buildings, retail buildings, office buildings, or some combination of the above. In recent years, there has been a trend toward mixed-use buildings that may contain a combination of retail, office, restaurant, and residential types.

Application for Commercial Loans

Commercial mortgage underwriting occurs with residential property that is not owner-occupied (income-producing residential), and all non-residential property (which is predominantly income-producing). Lending practice for this category of property (which includes vacant land loans and development financing) is generally referred to as mortgage underwriting. The process used in underwriting income-producing properties is similar to that for residential borrower qualification except that the income from the property is given emphasis. Therefore, the focus is on the property's *net operating income* (NOI). The commercial mortgage lender is concerned with the margin of safety existing between the outstanding balance on the loan and the value of the property securing the loan, and the margin of safety existing between the income available to be used to repay the loan and the mortgage payments.

commercial mortgage underwriting
occurs with residential property that is not owner-occupied (income-producing residential) and all non-residential property (which is predominantly income-producing)

net operating income (NOI)
gross potential revenue less vacancy allowance, bad debt allowance, and total operating expenses (amount is calculated excluding income tax, mortgage payments, and depreciation expense or capital cost allowance)

Mortgage brokers are often involved in commercial lending. In these cases, mortgage brokers are given a mandate to seek out financing. Mortgage brokers seek out prospective lenders and secure quotations from lenders that are presented to borrowers.

The qualification procedure used will depend upon the following factors:

- Applicant's track record

- Applicant's other assets (market value vs. book value)
- Applicant's management capabilities
- Mortgage and real estate market conditions at the time of the application
- Type, age, condition, and location of the property securing the loan
- Strength of the covenants of tenants resident in the property
- Strength of the covenants of the borrower

In the loan application, the property is identified by legal description and accompanying site plans (where possible). The building plans and specifications (for existing or proposed buildings) are also required to allow accurate calculation of gross and net rentable square footage and to judge the quality of the space. Gross square footage includes all space within the exterior dimensions of a building while net square footage refers to usable space, excluding access space, servicing space, etc. The ratio of net to gross leasable space is referred to as the efficiency ratio. As well, information on the quality of the improvements is helpful in verifying estimates of gross rents and operating expenses. A tenancy schedule will be required, listing all the tenants, as well as the terms and conditions of the tenancy agreements. In some cases it may be essential to provide a copy of the executed lease agreement in its entirety. Credit references or annual reports of the tenants (which will establish the strength of their rental covenants) are useful additions to the submission. Furthermore, the borrower must be identified with evidence of financial soundness and reputation. Complete and confidential financial statements (outlining income and expenses, typically over the past three years) should be included. In addition, a brief outline of previous business experiences and projects will aid the presentation. A complete presentation of facts is the generally recommended procedure to obtain the optimal mortgage; potential applicants should not omit certain key facts, which may be discovered later.

The preceding factors are all pertinent to establishing the strength of the security for making the loan. Any presentation to acquire financing will also include details concerning the mortgage requested, including the amount sought, the term, and the amortization period. An application fee of 15-25 basis

points (0.15% to 0.25%) will accompany the application. Once the loan is approved and the lender issues a commitment letter, a commitment fee of 1% to 2% of the requested loan amount is returned with the executed commitment letter.

The requirement for the payment of a commitment fee is to discourage a borrower from pulling out of the agreement (for example, if interest rates drop between the time of application and the date of loan approval or the date for advancing of mortgage funds). However, given the desire to apply for other loans in the future, borrowers are reluctant to withdraw from existing contracts. In the past, larger loans may have had agreements for one to two years before any advances were to be made and over this period of time drastic rate changes were possible. In years where the markets are volatile, lenders will set interest rates for a much shorter time period, e.g., 30-60 days.

Cash Flow Analysis

While the value of the interest in real property is the prime security in the event of default, the cash flow from the property is the prime source of funds used to service the loan and to prevent default. Thus, as in residential underwriting, the lender is first concerned with the ability of the borrower to honour the contractual obligation to make payments. In commercial underwriting, the lender will focus on the income from the property but will also consider the applicant's general financial strength and track record. Lenders generally require that subject properties be self-supporting, even when the contractual covenant of the investor is sound. In the event of default or a sale to another investor, the lender has no guarantee that a subsequent owner of the property will have a good covenant. Therefore, the lender will insist that the purchaser's covenant must be equal to or greater than the original borrower's covenant. Further, in the event of foreclosure, the lender will not want to make additional contributions to the property. Therefore, the basis of commercial lending policy is to lend on property that has sufficient annual revenue to pay all the landlord's share of expenses associated with the operation of the property plus the mortgage payments, and still have a margin of safety (expressed as a percentage of the net operating income from the property). This use of percentages of property income to determine the maximum income available to support a

mortgage is similar to the use of gross debt service ratios in the residential area. However, the calculation of cash flow from a property is more detailed than the determination of the gross income of a residential borrower.

Review of Lease Terminology

Lease terms, among other items, dictate how much rent is paid and the specific terms of the lease arrangement. There is considerable variation amongst the types of commercial real property types, but some general comments can be made.

A *gross lease* (inclusive lease) is a lease in which the owner pays taxes, insurance, maintenance, services, operating costs, etc. and applies primarily to residential apartments, older and/or smaller office buildings, and government leases.

A *net lease* is a lease in which the tenant assumes payment of a base rent and all property charges, such as taxes, insurance, utilities, repairs, maintenance, etc. In a triple net lease, the tenant pays all expenses related to utilities, taxes, and operating expenses (maintenance, repairs, and insurance).

A *percentage lease* is a lease where the tenant (usually in retail situations) is required to pay a specified percentage of gross or net sales made upon the premises. Sometimes a percentage lease is combined with a base rent (i.e., the greater of $10,000 per annum, or 12% of gross sales in excess of $100,000). There are many variations of percentage leases.

When analyzing the cash flow from the property, the lender may utilize the revenue and operating expense information from the loan application, the appraisal report, consulting reports, internal data, or some combination of these. The revenue and expense data used will be derived from annual projected cash flows, but the lender will be concerned with values that will be reflective of a typical year. Thus, the lender will estimate a stabilized budget of revenue and expense that, while not necessarily equal to any one year's budget, will be representative of the expected operation over the term of the loan. For example, if a new property (or a proposal development) is being evaluated, the third or fourth year projected budget may be used, thereby eliminating the typical years of lease-up.

Alternatively, the lender may require some minimum lease performance before a maximum loan is granted, e.g., the lender may not advance the full loan unless 85% of the space is leased at the time the loan is to be drawn. On existing properties, the financial statements for the next year are generally used, providing no significant unusual items of revenue or expense are anticipated in that year. Otherwise, a more typical year, or an average budget will be used.

Lenders will also be concerned with the quality of the revenue. They will look not only at the magnitude of the revenue and expenses but also with the certainty that these will in fact be received. Thus, the degree of risk involved in the receipt of revenue will be evaluated. Clearly this factor is of greatest concern in development financing, a situation that has given rise to the structuring of this aspect of mortgage lending.

As an illustration of this financial analysis, consider the factors that may be analyzed for a loan on an apartment building. In general, the required information for an apartment includes the following items.

Gross Potential Rental Income

Gross potential rental income is the expected annual gross income from the property, at 100% occupancy, based on the type of lease arrangements commonly used for this type of property. For apartments, the lease is generally short term (mainly month-to-month) with gross income to the landlord. The landlord is responsible for all expenses. This is contrasted with net rent to the landlord, where the tenants pay some, and perhaps all, of the operating expenses.

The lender must determine whether the projected rents, vacancy rates, and turnover are competitive with similar apartments in the area. The lender will also be concerned with the type of units, amenities, facilities, and equipment included in the units since these will affect the future pattern of rents and expenses. A lender would want to know what facilities and services are included in the gross rent, such as parking and laundry facilities.

Allowance for Vacancy and Bad Debts

A long-run conservative estimate for annual vacancy and bad debt allowance is required to arrive at the effective gross income. Factors to be considered in estimating this allowance include:

- Past performance for the subject property
- Age and quality of the subject property
- Economic state of the area
- Vacancies in comparable buildings

- Type and quality of tenants
- Level of rents anticipated
- Impending new competition

Illustration 12.4

The subject property is a 27-suite apartment building with market rent of $1,325 per month. Annual parking revenue is estimated at $200 per year for each of the 20 parking stalls. Potential laundry revenue is $3,000 per year. The estimated vacancy allowance for rental income is 2% of gross potential rental income and the estimated vacancy allowance for parking revenue is 10% of gross potential parking revenue.

Solution:

The vacancy allowances for the apartments and parking are subtracted from the gross potential rental income to determine the effective gross income. For example:

	Gross Potential Rental Income (100% Occupancy)		
	($1,325 per month × 12 months × 27 suites)		$429,300
+	Parking Revenue (20 stalls × $200 per year)		4,000
+	Revenue from Laundry		3,000
	TOTAL GROSS POTENTIAL INCOME		$436,300
–	Vacancy Allowance Apartments 2%	$8,586	
–	Vacancy Allowance Parking 10%	$400	
–	Total Vacancy and Bad Debt		8,986
	EFFECTIVE GROSS INCOME		$427,314

Vacancy rates are estimated by reviewing the local market. For example, in the Vancouver Census Metropolitan Area (CMA), the purpose-built rental apartment vacancy rate decreased from 2.6% in 2020 to 0.9% in 2022. In contrast, the purpose-built rental apartment vacancy rate for Edmonton CMA was 4.3% in 2022, a decrease from 7.3% in 2021. In Metro Vancouver, office vacancy rates remained relatively stable increasing to 5.9% for the third quarter of 2022 (a slight increase from 5.8% in the previous quarter). In comparison, overall office vacancy rates in Edmonton are 20.1% for the first quarter of 2023 (a slight increase from 2022 at 19.5%). Metro Vancouver's industrial vacancy

rate is the lowest in Canada at 0.1% as of June 2022, whereas Greater Calgary is at 2.21%, and Greater Edmonton at 4.2%.

Operating Expenses

Operating expenses include those annual outlays that are necessary to the continued productivity of the property and the maintenance of capital values, which are the responsibility of the landlord. Generally, operating expenses are stabilized or long-term averages and are divided into three categories: fixed expenses, variable expenses, and replacement reserves. *Fixed expenses* are costs that, in the short run, remain constant throughout the period, independent of the level of occupancy, e.g., real property taxes and insurance. *Variable expenses* are defined as outlays that vary directly with the level of occupancy, e.g., water, air conditioning, light, and power. In addition to the obvious annual expenses, operating expenses include allocations to *reserves for replacement* of short-lived items such as stoves, refrigerators, air-conditioning equipment, and roofing.

For example, some reserve should be established, based on the expected life of short-lived equipment, and recorded in the operating expense section. The amount is generally found by reference to the replacement cost and the expected life of the fixtures. As a simplistic example, assume each apartment in the above illustration has one refrigerator and stove, each valued at a replacement cost of $1,000 and expected to last eight years. The reserve could be calculated as follows:

27 Suites × ($1,000 + $1,000) = $54,000

Based on straight line, 8 years = $54,000 ÷ 8

Per Annum Reserve = $6,750

The operating expenses are generally checked with expenses and expense ratios of comparable properties. This comparison will usually involve the use of ratios, such as the ratio of expenses to gross income, or the use of expenses per unit or per square foot. Careful attention is given to any particular items that may have been neglected by the owner or manager, or omitted from the owner's statements. For example, a fee for property management must be included even though the subject property is managed by the owner. The lender has no guarantee that the next owner will want to manage the property and must allow

for this possibility. Periodic items such as insurance payment should be pro-rated to a one-year equivalent.

Occasionally, a lender will encounter a loan application involving a property in need of some major repairs and maintenance. If the repairs were made immediately, the rent value might increase substantially. On the other hand, if these repairs are not made, immediate expenses would be correspondingly lower, but the rent would also be lower. The lender may estimate the gross income assuming the repairs are made, and deduct the capital cost of the (unusual) repair and expense items from the capital value of the property. Care must be exercised to ensure that the repairs are made.

Net Operating Income

Gross potential rental income minus allowances for vacancy and bad debts equals effective gross income. Effective gross income minus operating expenses equals the net operating income (NOI).[8] It is the income that is available to service the mortgage debt and provide a return on equity.

Illustration 12.4 continued

Assuming the annual operating expenses are estimated at $131,750, the calculation for net operating income is as follows:

	Total Gross Potential Income	$436,300
–	Vacancy and Bad Debt Allowance	–8,986
	Effective Gross Income	$427,314
–	Operating Expenses (including reserve allowance)	–131,750
	Net Operating Income	$295,564

Note that in this analysis the lender should look for consistency in the assumptions and forecasts. If the assumed or forecasted rents are at the top range in the market, then one might logically expect either a higher vacancy rate or higher operating expenses to maintain tenants. This consistency can be checked by reference to available market data.

Lending Policy

As with residential underwriting qualification, in commercial loan qualification, the lender will use two constraints: a loan-to-value constraint and

an income constraint – and choose the lower of the two loans indicated.

Loan-to-Value Ratio Constraint: Security for the Loan

The lender must ensure that the mortgage will meet a standard of security that is consistent with the requirements of the law, the individual lender, and the interest rate on the mortgage. Therefore, the lender must determine the lending value of the property. This is necessary to assure that the loan does not exceed the maximum for loan-to-value ratios that many financial institutions observe, and to establish the initial margin of safety between the outstanding debt and the liquidation value of the property. In strong economic times, lenders may lend up to 80% of value. However, in uncertain and volatile economic times, lenders will lend considerably less (60-65% is typical).

Illustration 12.5(a)

A lender has concluded that a property will generate an annual net operating income of $43,475 after all operating costs and after a suitable allowance for vacancy and bad debts. Given this estimate of annual net operating income and after considering investors' yield expectations for this type of property, the lender feels that a lending value of $700,000 is appropriate. What is the maximum mortgage loan amount in this scenario?

Solution:

If the lender is willing to advance 70% of the lending value, the loan-to-value ratio constraint will restrict the maximum loan to $490,000 (0.70 × $700,000).

Income Constraint

Once the information concerning projected revenue and expenses has been tabulated and analyzed, the lender will apply lending policy to determine the size of the mortgage that the net operating income (NOI) from the property can support. To provide some assurance that the borrower will be able to make the necessary payments, the lender will insist that only a portion of the annual NOI be utilized for payments. There are two ways of expressing the income constraint; both give the same information but in different forms. The first way

of expressing the income constraint is the *safety margin* and the second is the *debt coverage ratio*.

Safety Margin

The *safety margin* represents a percentage of NOI that must be set aside to ensure that the NOI can cover the mortgage payments.

safety margin
ensures that the NOI can cover the mortgage payments by expressing the margin between the NOI and mortgage payments as a percentage of NOI

For example, if the safety margin percentage is 20% of NOI, the maximum safety margin payment is 80% of NOI. In other words, if a lender set a margin of safety of 20% of NOI, the maximum allowable mortgage payments cannot exceed 80% of NOI. This practice is used to ensure that income from the property is sufficient to cover required mortgage payments. A second consideration is based on the fact that the calculation of NOI is only an estimate. If gross potential income, vacancy rates, operating costs, or bad debts change over time, NOI will also change. This margin provides a cushion, or safety valve, limiting the likelihood of arrears or default in response to a decrease in net income. The lender will insist that annual payments of principal and interest be limited to a maximum of some specified percentage (e.g., 75%) of annual NOI, leaving the remaining percentage (e.g., 25%) of NOI to provide the safety margin. The next step is to translate the maximum allowable payments into the corresponding loan amount, given the proposed terms of repayment.

HELPFUL HINT!

Safety Margin (dollars) = NOI × Safety Margin %

Safety Margin Payment = NOI × (1 – Safety Margin %)

Illustration 12.5(b)

Continuing from Illustration 12.5(a), assume that the lender insists that annual payments of principal and interest is limited to a maximum of 80% of annual NOI (i.e., a safety margin of 20% of NOI). Therefore, the maximum allowable mortgage payments are $34,780 (0.80 × $43,475).

The next step is to translate the maximum allowable payments into the corresponding loan amount, given the proposed terms of repayment. Assume the lender is willing to advance funds at 6% per annum, compounded semi-annually, and amortize the loan over 25 years with monthly payments.

Solution:

$$\text{Maximum Monthly Payment} = \frac{\text{Annual Debt Payments}}{12}$$

$$\text{Maximum Monthly Payment} = \frac{\$34,780}{12} = \$2,898.33$$

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	Equivalent j_{12} rate
2898.33 +/– PMT	–2,898.33	Maximum monthly payment
300 N	300	Amortization period
0 FV	0	FV is not used
PV	453,000.936962	Maximum loan

Thus, given an interest rate of 6% per annum, compounded semi-annually, and an amortization period of 25 years, the income from the property is sufficient to support a loan of $453,000, rounded.

Even though the loan-to-value constraint would justify a loan of $490,000, the combination of annual NOI, portion of income allowable to service the loan, interest rate, and amortization period restrict the loan amount to $453,000, or 65% of lending value.

Debt Coverage Ratio (DCR)

While it is intuitively appealing to use the safety margin, the commonly used income constraint is the *debt coverage (or debt service coverage) ratio*. This ratio is merely another way of expressing the safety margin.[9] Rather than saying that the mortgage payment can only be a portion of NOI (80% in this illustration), the DCR states that annual NOI must cover the annual debt service payments

more than once, e.g., a DCR requirement of 1.2 means that NOI must be 1.2 times the size of the required payments. By definition, the DCR is the ratio of the property's annual NOI to the annual debt service. The appropriate DCR to apply will fluctuate and is affected by factors such as interest rates, property type, vacancy rates, length of term, and economic conditions. In the past, a common DCR for apartment buildings was 1.2. However, underwriting criteria tend to tighten up in more volatile economic times, meaning a higher DCR is more likely (e.g., 1.3-1.35). CMHC-insured commercial buildings will have higher debt coverage ratios than non-insured equivalent buildings. In addition, smaller buildings (e.g., less than 5 units) may have lower DCRs and non-apartment commercial buildings (e.g., warehouses, industrial space) will have higher DCRs (e.g., 1.4-1.5).

debt coverage ratio (DCR)
the ratio of the property's annual NOI to the annual debt service

HELPFUL HINT!

The debt coverage ratio (DCR) formula is:

$$\text{DCR} = \frac{\text{Annual NOI}}{\text{Annual Mortgage Payments}}$$

The formula may need to be rearranged depending on the information provided in the question. For example:

$$\text{Annual Mortgage Payments} = \frac{\text{Annual NOI}}{\text{DCR}}$$

Illustration 12.5(c)

Continuing with the facts from Illustration 12.5(a), i.e., an annual net operating income of $43,475, assume that the lender sets a debt coverage ratio of 1.3. What is the maximum loan amount, given that the lender is willing to advance funds at 6% per annum, compounded semi-annually, and amortize the loan over 25 years with monthly payments?

Solution:

Use the DCR formula to determine the maximum annual mortgage payments and then translate the maximum allowable payments into the corresponding loan amount, given the proposed terms of repayment.

$$\text{DCR} = \frac{\text{Annual NOI}}{\text{Annual Mortgage Payments}}$$

$$1.3 = \frac{\$43{,}475}{\text{Annual Mortgage Payments}}$$

Rearranging the above equation gives us:

$$\text{Annual Mortgage Payments} = \frac{\$43{,}475}{1.3}$$

These payments are slightly lower than those indicated previously by the safety margin; therefore, the maximum loan allowed will also be lower. Assuming the same repayment terms as before, the maximum loan would be calculated as $435,578, rounded.

Calculation (continued)

Press	Display	Comments
	5.9263464	j_{12} rate from interest rate conversion
2786.86 +/– PMT	−2,786.86	Maximum monthly payment
300 N	300	Amortization period
0 FV	0	FV is not used
PV	435,578.485259	Maximum loan

Illustration 12.5: Summary

- Loan-to-Value Ratio Constraint □ $490,000 maximum loan
- Income Constraint
    - Safety Margin: $453,000 maximum loan
    - Debt Coverage Ratio: $435,578 maximum loan

The maximum loan is $435,578 since the debt coverage ratio is the lowest and is the binding constraint.

CONCLUSION

The mortgage underwriting and borrower qualification process is an important part of mortgage lending. Lenders want to collect as much information regarding a potential borrower to minimize risk. Mortgage brokers should understand loan application and credit analysis procedures, as well as how lending constraints are applied to assist in the residential and commercial mortgage lending process.

1 *www.theglobeandmail.com/globe-investor/personal-finance/mortgages/self-employed-face-latest-hurdles-in-quest-for-a-loan/article17614139*

2 These methods are discussed in subsequent chapters.

3 In this chapter, payments are rounded to the nearest cent, as in previous chapters. On occasion, this will cause the borrower to be granted a loan that slightly exceeds the gross debt service constraint. However, the increase in the loan amount caused by rounding the payment up instead of down is insignificant.

4 For simplicity, this illustration does not apply the stress test as required by the Office of the Superintendent of Financial Institutions (OSFI). The stress test will be explained and illustrated shortly.

5 The steps involved in foreclosure are covered in Chapter 7.

6 We have assumed that there are no heating costs, which, if included, would reduce the amount that the borrowers qualify for. In addition, we have assumed that the borrowers have no other debts; therefore, the TDSR is not applicable. If other debts were added, the maximum values may change.

7 $$\text{Loan-to-Value Ratio (LTV Ratio)} = \frac{\text{Loan}}{(\text{Loan} + \text{Down Payment})}$$

8 It is important to note that this net operating income figure is not to be confused with a net income that might be used by an investor. An investor would include actual income whereas a lender generally uses stabilized incomes. As well, the net income must not be confused with the cash flow to the investor either before or after tax.

9 Note that the debt coverage ratio is equal to 1 ÷ (1 – Safety Margin). For example, if a safety margin of 25% is set by a lender, this implies an equivalent DCR of 1.333333 [(1 ÷ (1 – 0.25)].