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Mills • Hamilton

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Housing Finance and Investment

☐ The last chapter painted the broad picture of the housing sector in the United States. In this chapter, the focus is narrowed to discuss housing finance and investment. The United States has one of the world's most complex and sophisticated systems of housing finance. The financial system services an enormous and diverse clientele of dwelling owners. Home ownership is the most dispersed form of asset ownership in the nation, far more dispersed than ownership of corporate stocks or of bonds. Nearly two-thirds of dwellings are owner-occupied, and rental dwellings are mostly owned by small proprietorships and partnerships that own only a few dwellings each. This chapter explores how markets and tax considerations motivate and facilitate such diverse ownership.

There is a mystique to home ownership in the United States and in most other countries. Governments and private groups emphasize that home ownership is "the American dream." It is widely believed that home ownership is a superb investment, that it provides an important element of control over owners' lives, and that it is the source of important pride of ownership. House occupancy is a consumption decision, as has been emphasized in the previous chapter. Home ownership is an investment or portfolio decision. An important task of this chapter will be to dissect the dream into its components.

An important consideration regarding home finance is that dwellings are superb collateral. A home owner can help finance the investment with a mortgage that has an interest rate which is about the same as that on a high-grade corporate bond. Furthermore, an enormous variety of mortgages is available to home owners. These facts will be important in helping to answer a key question in the chapter: Is home ownership a good investment?

☐ DEFINING SOME TERMS

People tend to think that everyone knows what is meant when they refer to commonly used terms. Because it is important to avoid confusion, some of the terms used in this discussion are defined as follows:

1. *Dwelling* is a place where an individual or people in a household live. In the United States, it normally consists of a kitchen, one or more bathrooms, and living areas for the exclusive use of the members of the household.
2. *Single-family structure* describes a building that contains just one dwelling.
3. *Single-family detached structure* is a single-family building that is not attached to another structure.
4. *Apartment* is a dwelling in a building that contains at least two dwellings.
5. *Condominium* (condo) is a dwelling that is either an apartment or an attached structure (row house, town house, semidetached house, and the like) that is separately owned and is in a group of such dwellings in which the owners elect a management board that administers common areas (e.g., entry ways, outer walls, roofs, grounds) and levies maintenance fees on condo owners to finance upkeep, repairs, and insurance of common areas.
6. *Cooperative* (coop) describes a dwelling that is either an apartment or an attached dwelling in which coop owners own shares in the entire coop complex, usually proportionate to the square feet of the owner's dwelling.
7. *Owner-occupied dwelling* is a dwelling that is owned by its occupant(s).

It is important to note that a condo or coop may or may not be owner-occupied; its owner may live in it or rent it to a tenant. Likewise, a single-family detached dwelling may be owner-occupied or rented to tenants. In fact, ownership forms are not perfectly related to any structure type. Most commonly, single-family detached dwellings are owner-occupied and apartments are rented. Property rights in apartments and town houses, however, are now well enough defined that they may be owned separately or jointly. Unfortunately, property rights in apartments are still not well enough defined and there are proportionately more disputes and litigation among condo and coop owners than among owners of detached dwellings.

HOUSING OWNERSHIP FORMS AND FINANCE

Ownership Forms

Most private fixed capital in manufacturing, mining, and utilities is owned by corporations.[1] The stock of private housing, which is half of the fixed capital in the country, is almost entirely owned by proprietorships and partnerships. A proprietorship is a single-owner business and a partnership is a business owned by two or more partners. The key legal characteristic of a corporation is that its owners have limited liability; their responsibility for the corporation's debts extends only to the value of their shares. In contrast, proprietors and partners have unlimited liability; all their personal assets can be seized to pay debts of the business. Limited partnerships are common ownership forms for commercial real estate (offices, shopping centers, rental apartment houses); it is a special kind of partnership in which most owners are limited partners—that is, their liability is limited to the value of their ownership certificates. It should be noted that a marriage is a special kind of partnership, governed by many special state laws and court decisions.

Housing Finance

Nearly all fixed capital in business is financed by a combination of debt and equity. Corporate debt consists of a variety of instruments such as bonds and commercial paper. Corporate equity is ownership shares. Real-estate proprietorships' and partnerships' debts are invariably mortgages. A *mortgage* is a loan secured by real estate. Limited partnerships' equities are often ownership certificates, very similar to corporate shares, and many limited partnership shares are traded on stock exchanges. There are normally no equity certificates for proprietorships or for small unlimited partnerships.

A mortgage is similar to a corporate bond. In both cases, the borrower agrees to pay back the loan to the lender on a stipulated schedule. The monthly payment on a mortgage is normally part interest and part principle, which are set so that the debt is retired during the life of the mortgage. Bond borrowers usually make two interest payments per year and pay the principle to the holder at maturity. Thus, most bonds are like interest-only mortgages. Bonds are typically offered for sale to the public, whereas mortgages are typically negotiated between a borrower and a small number of lenders. A bond may contain a call option, giving the borrower the right to pay the entire outstanding value of the bond at any given time, perhaps including penalty payments for early prepayment. A mortgage also contains a call option; the borrower can prepay at his or her discretion. Mortgages on commercial real estate

1. Fixed means normally not moved. The important kinds of nonfixed capital are transportation equipment and inventories.

typically require penalty payments for early prepayment. States regulate the ability of lenders to collect prepayment penalties on mortgages on owner-occupied houses, and they are now rare. Prepayment penalties are not permitted on mortgages insured or guaranteed by the Federal Housing Administration or by the Veterans Administration.

The ratio of debt to debt plus equity, or total-asset value, is referred to as leverage. For example, a dwelling worth $100,000 with a $50,000 mortgage has a leverage of 0.5. If leverage is 0.0, the asset is entirely financed by equity. If leverage is 1.0, it is entirely financed by debt. When originated, mortgages are often 70 to 90 percent of the dwelling's value, so leverage is 0.7 to 0.9.

Fixed rate mortgages. Until about 1970, almost the only kind of mortgage available to dwelling owners was a fixed-interest rate, fixed payment, fully amortized mortgage (FRM, for short). Under an FRM, a fixed periodic, invariably monthly, payment is made such that, after a stipulated number of payments, the principal and the periodic interest on the principal are paid off. For example, a $100,000 mortgage at 9 percent interest will be paid off in 30 years, 360 months, with a monthly payment of $804.60. The monthly payment for a FRM depends on the amount borrowed, the term, and the interest rate. Any hand-held calculator with a financial program will calculate the fourth number if any three of these numbers are punched in. In a FRM with a long term, the first few payments are mostly interest. Principal payments dominate toward the end of the term.

Adjustable rate mortgages. An adjustable rate mortgage (ARM) is more complex. It also has a fixed term and an initial interest rate that is set by the mortgage contract for a stated period, such as six months or one year. The contract states that, after the initial period, the interest rate will be adjusted periodically in relation to some publicly available interest rate. For example, the initial interest rate might be 7 percent for the first six months, and after that the interest rate might be adjusted every six months to 2 percentage points (200 basis points) above the index of interest rates on Treasury securities with one year to maturity. A variety of such indexes is published in financial newspapers and magazines. Finally, an ARM contract usually stipulates annual and lifetime caps, maximum amounts that the interest rate can move in a year or during the lifetime of the mortgage regardless of the movement of the index. Caps might be 2 percent in a given year and 5 percent over the lifetime of the loan.

An ARM contract is defined by more parameters than an FRM: amount borrowed, term, initial interest rate, interval between changes, index to which the interest rate is tied after the initial period, margin between the index and the ARM interest rate, and annual and lifetime caps.

FRM and ARM contracts account for nearly all home mortgages. Other types are available, however, and should be mentioned briefly.

Shared appreciation mortgages. A shared appreciation mortgage (SAM) is a fixed-rate, fixed-term mortgage, in which the borrower and lender receive contractual shares of the dwelling's appreciation when the dwelling is sold, the mortgage is paid off, or at some other stipulated time. The borrower obtains a lower fixed-interest rate in exchange for the agreement to share capital gains with the lender. SAMs are unpopular, in part because owners often make substantial investments in the home during the life of the loan (adding a bedroom or finishing an attic, for example), and it is difficult to estimate how much appreciation is capital gains and how much results from the new investment.

Reverse annuity mortgages. A reverse annuity mortgage (RAM) is sometimes obtained by retirees who own their home free of any mortgage. With a RAM, the lender sends the borrower a monthly check for a stipulated period, at the end of which the borrower must pay the lender an agreed amount or the lender takes title to the dwelling. In one RAM specification, the owners receive checks and retain occupancy until both die or they sell the dwelling. The terms of a RAM depend on the implicit interest rate, on the anticipated appreciation of the dwelling, and with lifetime tenure, on the life expectancies of the owners. RAMS may involve what economists call adverse selection, in that borrowers who know something about their health that the lender does not know may use the information to obtain a RAM on terms that are actuarially disadvantageous to the lender. In addition, RAM borrowers may be loathe to enter a nursing home when they should because they may lose rights to subsequent checks.

Price-level-adjusted mortgages. A price-level-adjusted mortgage (PLAM) is a fixed-rate, fixed-term mortgage in which the outstanding balance on the mortgage is adjusted periodically to reflect the rate of inflation. If you have a PLAM with a balance of $50,000 on December 31 and the CPI has risen 3 percent during the year, then your balance would rise to $51,500 on January 1. The implication is that the lender can lend at the real rate of interest and need not add on the inflation factor discussed in the previous chapter.

Comparisons. Nearly all home mortgages are FRMs or ARMs. An important reason is that only those mortgages can be sold on the secondary mortgage market, to be discussed. A crucial distinction between FRMs and ARMs is who bears prepayment risk. Most home mortgages have terms of 30 years, but the average life of a mortgage is between 10 and 15 years. Frequently, borrowers prepay because a job change, divorce, death, family growth or shrinkage such as the birth or

departure of children, or a large change in permanent income makes the family want a different home. Prepayments for these reasons occur when the call option on an FRM is "in the money" (current interest rates are below the FRM contract rate) or when the call option is "out of the money" (current interest rates are above the FRM contract rate). For example, a couple prepaid a 6.25 percent FRM mortgage and took out an 8.75 percent mortgage when they moved from Princeton to Chicago, an exchange that was painfully out of the money! (Virtually all mortgages have a due-on-sale provision.) Such prepayments occur almost at random relative to the level of current interest rates, which are relative to FRM contract rates. Thus, borrowers tend to prepay FRM mortgages when the prepayment option is in the money.

The FRM borrowers, however, increasingly prepay mortgages when interest rates are below their FRM contract rates. Very roughly, if current FRM interest rates are at least 2 percentage points below the fixed rate on an FRM contract, and there is still at least five years to pay on a mortgage, it is likely to benefit the borrower to refinance. (If there were no transaction costs of refinancing—application fees, closing costs, points—it would pay to refinance, if current rates were only slightly below your contract rate. Sometimes, lenders have "sales" on mortgages, in which they forgive some of the transaction costs.) If there are significant prepayment penalties, current interest rates must be farther below the contract rate.

With the stated caveats, lenders bear prepayment risks with an FRM. If interest rates rise above contract rates, investors take a capital loss, but cannot force prepayment, and borrowers celebrate at an expensive restaurant! If interest rates fall much below contract rates, borrowers prepay. Why do lenders care? One reason is that lenders may bear transaction costs that borrowers do not reimburse if a new mortgage must be originated. However, that would be the lenders' fault: Lenders are free to charge all of their transaction costs to borrowers. (Borrowers are also free to take their business elsewhere.) Much more important is that, to the extent that mortgages are prepaid because interest rates have fallen, lenders get money back exactly when it is not wanted. Lenders must lend the money again at current low rates. Statistically, borrowers tend to prepay FRMs when the call option is in the money, but not when the call option is out of the money. The borrowers' gain is the lenders' loss.

With an ARM, the interest rate goes up and down with market rates, subject to the contractual interval between interest rate changes and to caps. With those provisos, ARMs shift the interest-rate risks to borrowers. Interest-rate risks are large, since interest rates can move several percentage points during a year or so. Inevitably, people must be paid to assume risk. Thus, we should expect interest rates over mortgage lifetimes to be lower on ARMs than on FRMs. With FRMs, lenders bear the risks and must be compensated with higher interest rates. With

ARMs, borrowers bear the risk and must be compensated with lower interest rates.

Comparing interest rates on ARMs with those on FRMs is tricky because those on ARMs move through the life of the mortgage. In addition, the initial interest rate on an ARM is frequently set below what it would be if it were above the initial value of the index by the contractual margin. Such low-interest rates are referred to as "teasers," suggesting that low initial rates may tease borrowers into contracts without borrowers being aware that the interest rates are almost certain to increase in a few months. Nevertheless, typical FRM interest rates are above ARM rates calculated by adding the margin to the index. Borrowers are compensated for bearing the interest-rate risk, but probably not by much. The comparison is difficult, in that ARM contracts can be complex. Some ARMs have initial interest rates that may be fixed for a year or two and may contain an option on the part of borrowers to convert to an FRM.

One might guess that prepayments would be less common with ARMs than with FRMs, since ARM interest rates go down with market interest rates without prepayment. The opposite, however, is the case; prepayments are more common with ARMs than with FRMs. The reason seems to be the teaser rate. Consider a young university graduate who becomes a first-time home buyer in a new job. Having just paid off college loans, there is little money for a down payment, and the initial salary is low. The job's prospects, however, are good, and the graduate expects to stay in the dwelling only two or three years. The graduate takes an ARM with the initial interest rate locked in for two years, and is relatively unconcerned about the rate after the lock-in period. By that time, the buyer expects to be about ready to "buy up." The ARM may be a good choice.

Choosing among mortgages. How should a potential buyer choose among the large menu of mortgages currently available? The answer is shop around and calculate. In many cities, the real estate section of the Sunday newspaper presents data on a variety of mortgages currently offered by local lenders. Lay out a plan that states the likely price of the dwelling you may buy, the likely closing costs, your anticipated length of stay, and the combinations of down payments and monthly mortgage payments you feel comfortable with. (You should be willing to make larger monthly payments and smaller down payments, or smaller monthly payments and larger down payments. Remember, interest rates may be higher for a highly leveraged investment.) Then, use a computer to calculate the present value of a variety of payment options that the newspaper menu provides. You may need to phone a few lenders to obtain details not provided in the newspaper. For example, lenders have underwriting standards to qualify lenders: monthly mortgage payments relative to take-home pay, leverage limits, and so

on. The object is to find the mortgage among those available that has minimal present value of payments and satisfies the plan you have laid out. Once you have found a solution, shop around. Use the telephone to find out if some lenders may be willing to do better than the conditions in the newspaper. They may be intending to have a "sale," or they may be willing to provide more attractive terms to an especially high-quality borrower.

Secondary Mortgage Markets

Three distinct functions must be performed in connection with mortgages: origination, investing, and servicing.

Origination is a marketing activity. The availability of mortgages must be advertised, applications must be accepted and evaluated, loans must be approved, contracts must be drawn up, and loans must be issued and financed.

Investing refers to the fact that someone must hold the mortgage during its life. Investors hold a mortgage for the same reason that investors hold bonds: because of the interest income that it yields.

Servicing refers to collecting monthly payments, keeping accounts, and answering borrowers' inquiries. Among the important tasks of the servicing organization is the administration of escrow accounts. An *escrow account* is an account held by the servicer and into which the borrower pays funds that the servicer uses to pay real estate taxes and hazard insurance premiums when they are owed. Most mortgage contracts specify that an escrow account is to be maintained. Borrowers make monthly escrow account payments (along with their debt-service payments) equal to one-twelfth of the taxes and insurance premiums that the servicing organization estimates will be owed during the next 12 months. At closing, borrowers make an initial payment to the escrow account, such that with monthly payments, the account balance will be adequate to pay the bills when they come due, plus a reserve of one or two months' escrow payments. The mortgage servicers must manage the escrow account and answer borrowers' inquiries about the account. Escrow accounts provide a service to borrowers and protection for investors.

Until about 1970, all three functions were typically performed by the same institution, most often a local savings and loan association to which buyers applied for a mortgage. During the last quarter century, the development of a secondary mortgage market, plus gradual deregulation of financial markets, have revolutionized the housing finance sector. The key development is that originators no longer need to be substantial investors. That need restricted mortgage origination to institutions with large amounts of assets to invest in the mortgages they originated, almost exclusively depository institutions. Now originators can sell the mortgage to an institution that packages similar mortgages and issues

bonds that are backed by the mortgages. The most important of such institutions are two governmental or quasi-governmental institutions, the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation. The bonds are sold on bond markets, just like other governmental and corporate bonds.

The secondary mortgage market is now extremely large, with trillions of dollars worth of bonds outstanding. The growth of the market has been highly advantageous to home buyers. Most important is that it has gotten mortgages into the national and international bond markets, helping to integrate financial markets and helping to mitigate regional and cyclical variations in mortgage interest rates. Also important is the entry of nondepository institutions into the mortgage-origination sector, making it more competitive. Lending institutions can sell their mortgages soon after origination, so they can turn their money over quickly (on very tight margins) and thus originate mortgages even if they have only modest assets. Finally, the characteristics that make mortgages saleable in the secondary market—15- or 30-year terms, FRMs and ARMs, common underwriting criteria—have enabled borrowers to shop for mortgages on the basis of important characteristics and to compare alternatives precisely.

The mortgage-origination sector is highly dispersed. Depository institutions are still the largest originating groups. However, many mortgage-banking firms and other financial firms now originate mortgages. Mortgage investing is also dispersed, as much as the bond-holding sector. Insurance companies, pension funds, and large industrial corporations invest in mortgage-backed bonds. Depository institutions still invest in mortgages, especially in mortgages that they originate but cannot be sold on the secondary market. Depository institutions are large investors in mortgage-backed bonds; they are preferable to mortgages because they can be bought and sold at any time with minimal transaction costs. Mortgage servicing is dispersed, but computerization gives an advantage to large servicers who handle thousands of mortgages. An efficient servicer should be able to bring the details of a mortgage and escrow account onto a computer screen, answer queries, and settle problems in one phone call with the client. The largest servicer services only about 2 percent of mortgages that are outstanding. The secondary mortgage market handles almost exclusively home mortgages; a secondary market is developing slowly for mortgages on commercial real estate. Mortgage-backed bonds can, however, be issued, backed by mortgages on apartment houses.

☐ TAXATION OF HOUSING

Rental housing is taxed differently from owner-occupied housing. Some housing is both: A landlord may live in one of the apartments in

the building. In that case, part of the building is taxed as owner-occupied and part is taxed as rental housing. Usually, the division is in terms of square feet of floor space. Taxation of housing is complex in detail, but simple in basic outline. Almost all privately owned housing is subject to real estate taxes. Local governments assess the dwelling, usually at a fraction of its estimated market value. In some places, the law states that assessments should be at full-market value; in other places, the law may state a target fraction of market value as an assessment goal. Nevertheless, assessment is rarely at full-market value. Assessment is an administrative matter; the local legislature sets a tax rate per dollar of assessed value. In many jurisdictions, rental housing is assessed at a larger fraction of market value than owner-occupied housing. In metropolitan communities, annual real estate taxes tend to be 1 to 2 percent of the dwellings' market values.

The remainder of this section is about federal income taxation. Most states also have income taxes, and state taxes invariably include income on rental dwellings. Provisions vary, but state income taxes on income from rental dwellings are deductible on the federal tax form. State income taxes are mostly 5 to 20 percent of the taxpayer's federal income tax liability.

Rental Housing

Virtually all privately owned rental housing is owned by proprietorships or partnerships. These are *pass through* organizations, meaning that all their income is passed through to the organizations' owners, and the owners are taxed at personal income-tax rates. Proprietorships and partnerships, unlike corporations, do not pay taxes, but all their income is subject to tax by their owners, whether the income is distributed to owners or retained by the business.

Taxable income from operating rental housing is based on rents received minus all normal and necessary costs of doing business. Costs include mortgage interest, insurance, maintenance, repair, depreciation, utilities (if paid for by the owner) and costs of marketing the apartments. Annual depreciation for tax proposes is straight line over 27.5 years. That means that 100 (1/27.5) $\cong$ 3.6 percent of the basis can be subtracted from rents each year for 27.5 years in computing the owner's yearly taxable income. The basis on which depreciation is calculated is purchase price plus transaction costs at time of purchase. The annual tax liability is taxable income multiplied by the owner's tax rate, which was 0, 15 percent, or 31 percent in 1992, depending on the owner's taxable income.

On sale, the owner pays capital gains tax. The capital gains tax base is ([sale price − transaction costs of sale] − [purchase price + transaction cost of purchase − accumulated depreciation since purchase]). Capital

gains tax liability is the capital gains tax base multiplied by the taxpayer's income-tax bracket.

If either taxable income from operating the property or the capital-gains tax base is negative, the loss can be carried forward under complicated rules.

Owner-Occupied Housing

Because there is no market rent, the federal government does not levy income taxes on owner-occupied housing. For the same reason, owner-occupied houses cannot be depreciated for tax purposes. Real estate tax payments and mortgage interest, however, can be deducted on the federal personal income-tax form, provided the owner itemizes. It is worthwhile for most owner-occupiers to itemize.

Owner-occupied housing receives favorable treatment regarding capital gains taxation. If an owner-occupier sells the home and purchases another home to occupy within two years, and pays at least as much for the new home as was received for the old home, then capital gains taxation is deferred.[2] An owner-occupier can continue to defer capital gains taxes on principal residences by such sales and purchases, provided the requirements are satisfied. In addition, once at least one owner-occupier spouse reaches 55 years of age, a once-in-a-lifetime capital forgiveness of up to $125,000 on owner-occupied property may be taken. If capital gains tax is paid on an owner-occupied dwelling, the tax equals the capital gains times the taxpayer's tax rate.

Finally, unrealized capital gains on owner-occupied housing or on any other asset are forgiven at death. For tax purposes, heirs value the property at its market value at the time of the owner's death, but neither the deceased owner's estate nor the heirs pay capital gains tax on the asset.

Comparison

Federal taxation of real estate is absurdly complex. Congress tries to make so many distinctions in the tax status of various groups that the laws, regulations, and important court decisions would fill a good-size room.

2. The correct terms are the bases, not the purchase prices, of the old and new properties. The bases take account of transactions costs of purchase or sale, and of some other items. In addition, the home must be the principal residence and must have been occupied by the owner for a stipulated period prior to sale. There is a somewhat similar provision for capital gains tax forgiveness on rental dwellings (and other commercial real estate) called a Section 1031 like-kind exchange, but the eligibility conditions are much more restrictive than those for capital gains tax deferment on owner-occupied homes.

There are three important differences between taxation of owner-occupied and rental dwellings. First, net rental income is taxed for rental dwellings but its counterpart, net inputed rental income, is not taxed for owner-occupied dwellings.[3] As with landlords, owner-occupiers are permitted to deduct real estate taxes and mortgage interest despite the fact that net inputed rent is not taxed. Second, landlords can deduct depreciation, whereas owner-occupiers cannot, and the permitted depreciation is considerably greater than actual depreciation.[4] This tax shelter is also available to owners of depreciable commercial real estate. Third, capital gains are virtually untaxed on owner-occupied dwellings, whereas they are taxed on realization at income-tax rates for rental dwellings.

Do these tax differences affect the rent landlords must charge compared with the inputed rent that homeowners charge themselves? The answer is yes. Return to the example of the owner-occupier's inputed rent just following Equation (10.6) in Chapter 10. In that example, the rent to value ratio (R/V) was .07. To compare that with the competitive rent on the same dwelling if it was rental instead of owner-occupied, take out the capital gains in both cases. If one assumes that the ownership by the landlord or owner-occupant is long term, capital gains and capital gains taxes will not be cash flows for many years, so the present values of those flows will be small. Thus, the rent to value ratio for the owner-occupier becomes .082, and the inputed rent becomes $16,400 per year, or $1,370 per month.

For the rental option, the calculation is a little more complex. Assume that the landlord's after-tax cash flow must yield a return of 8 percent, or an after-tax return of .08 (1.00 − .31) = .055 on the landlord's equity. Then, competitive rent must be

$$\boldsymbol{R = \text{costs} + .055\ (V - M),} \qquad \textbf{(11.1)}$$

where M is the landlord's mortgage balance. Then, the calculation

3. If Congress wanted to tax inputed rental income on owner-occupied dwellings, the cost of capital formula in the previous chapter would be the place to start. Capital gains would need to be removed from the formula, since it is taxed separately. The Swedish government has made a half-hearted attempt to tax inputed rental income of owner-occupied housing, but it appears to be the only country that has made the attempt.

4. If a dwelling lasts 50 years, real depreciation averages 2 percent per year. With an inflation rate of 2 to 4 percent per year, most dwelling prices increase in an average year. It has been pointed out that the accumulated depreciation since purchase is added in computing the landlord's capital gains tax base on sale of the property. Thus, if all else is equal, each dollar of depreciation during the ownership period increases the taxable capital gains at the time of sale by one dollar. Depreciation is thus best viewed as a loan by the government to the landlord that must be repaid at the time of the sale. Thus, the benefit of depreciation to the landlord is the after-tax interest that can be saved because of the depreciation loan.

indicates that the rent to value ratio (R/V) is .097, the annual rent is \$19,390, and the monthly rent is \$1,620.[5]

The conclusion from this realistic example is that the inputed rent for a \$200,000 owner-occupied dwelling is about 15 percent lower than the competitive rent for the same dwelling, because of the differences in tax status. Different parameters would yield different conclusions, but the 15 percent difference is typical for American dwelling values and the other parameter values in the early 1990s. The reader can redo the calculation for other parameter values. Owner-occupancy is indeed a tax-favored ownership status.

☐ IS OWNER-OCCUPANCY A GOOD INVESTMENT?

Dwelling occupancy is a consumption decision; home ownership is an investment or portfolio decision. The demand for housing has been discussed extensively; this section analyzes the portfolio decision. In earlier decades, apartments were almost impossible to own separately and were almost always rented. Now, property rights have become well-enough defined so that any physical type of dwelling can be owner-occupied or rental. The division between the two forms of occupancy is demand driven.

The most common answer to the portfolio question is the rhetorical question: Why pay it to a landlord when you can pay it to yourself? The fallacy in this question is that housing entails large and real costs, such as taxes, interest, and insurance. Indeed, as has been shown, the same kinds of costs are incurred by owner-occupiers as by landlords. Neither owner-occupiers nor landlords have any monopoly power, so neither group can expect to receive more than competitive returns on the investment. The only component of housing cost that an owner-

5. Equation (11.1) can be written

$$R = iM + (T+c)V + \text{income tax} + .055\,(V-M).$$

The landlord's income tax liability is

$$\text{income tax} = t[R - iM - (T+C)V - dfV],$$

where d is the depreciation rate for tax purposes and f is the fraction of the property value that is structure (the land cannot be depreciated).

Using the parameter values used in Chapter 10, the parameter definitions and values are as follows:

V = market value of dwelling = \$200,000
i = mortgage-interest rate = .08
T = real estate tax rate = .01
c = all other recurrent costs = .02
t = income-tax rate = .31
M = mortgage balance = 150
d = depreciation rate = 1/27.5 = .036
f = fraction of property value that is structure = .8

occupant pays to himself or herself is the return on equity in the dwelling. As we have also seen, landlords also must receive a competitive return on their equity; otherwise, they would not hold the asset.

Homeowner advocates sometimes take a different stance. Someone may say, "The next President of the United States is likely to follow policies that will raise the rate of inflation and interest rates, so this is a good time to buy a house and get a mortgage, while house prices and interest rates are low." The fallacy in this stance is that it assumes that the speaker can outguess the market. To the extent that homeowners and mortgage lenders anticipate inflation, prices and mortgage-interest rates take the anticipated inflation into account. If you can outguess the market, if you can forecast inflation better than others, then you can make money in the housing market, or in many other markets. But remember, thousands of market participants are trying to do the same thing!

In fact, about 65 percent of Americans are owner-occupiers, and 35 percent are renters. Is one group rational and the other irrational? That seems unlikely. If not, what circumstances make it rational for one group to be owners and the other to be renters?

In the long run, MSA housing prices tend to increase about one percentage point faster than the rate of inflation. The important reason is that the metropolitan population grows faster than the overall population and, therefore, MSA land values rise a bit faster than the rate of inflation. That finding suggests a real rate of return on housing investment of about 1 percent, whether you are an owner-occupier or a landlord. That return is not very high on an illiquid and risky investment. Stocks listed on the New York Stock Exchange provide an average real return of 8 or 9 percent.[6] Now suppose that the dwelling purchase is financed by a 75 percent mortgage and that the mortgage-interest rate is about the return that the dwelling investor could earn on an alternative and similarly risky investment. Then the landlord or owner-occupier receives the entire 1 percent real return on his or her 25 percent equity, or a total real return of 4 percent. That is not as good as the stock market, but better than an unleveraged investment in corporate or government bonds.

The preceding example is meant to identify the ball park for housing returns, but does not distinguish between owner-occupancy and rental status. In fact, there are two important differences between the two forms of occupancy: tax status, which has been discussed, and transactions costs. Transactions costs refer to the costs of buying, selling, or renting a dwelling. They are incurred by the occupant, at the time of moving in or out. They are one-time costs, not recurrent, so they are not part of the cost of capital, and have not been included in the cost of capital equations in the previous chapter.

6. See Brealey and Myers (1991), p. 131.

Transactions costs of both renters and buyers include the financial and time costs of searching for a dwelling and the cost of moving possessions and people from one dwelling to another. Movers incur much greater costs searching for a dwelling to buy than for a dwelling to rent, since the investment is much greater. In addition, for a renter, transactions costs include the interest cost of a security deposit. For a buyer, transactions costs also include fees and points on a mortgage, and any other fees and taxes that must be paid when buying a dwelling. When the dwelling is sold, a buyer must be found, and a realtor is normally retained for the purpose. Legal advice may be needed for the purchase or sale, or both. Transactions costs vary from person to person and from move to move, but on the average, the transactions costs of buying a home are probably about 5 percent of the value of the dwelling, and perhaps 2 percent of the value of the dwelling for a renter. Transactions costs for selling the owner-occupied dwelling are probably about 10 percent of the dwelling's value, the big difference being that the realtor's fee is paid by the seller. For a renter, the transactions of moving out are probably about the same as those of moving in, about 2 percent of the dwelling's value.

We have seen that the cost of capital is lower for owner-occupiers because of differences in tax status, and we have now seen that transactions costs are higher for owner-occupiers than for renters. An easy implication of these facts is that people who expect to stay in the dwelling for many years are much stronger candidates for owner-occupancy than are those who anticipate short stays. Longer stays mean that the lower capital costs can dominate the one-time transactions costs.

To make the comparison precise, we employ Equation (11.2) for the buyer's total costs,

$$PV_{H0} = \sum_{t=1}^{T} \frac{R_{Ht}}{(1+r)^t} + (C_{H0} + V_0 - M_0) - \frac{V_{HT} - M_T - C_{HT}}{(1+r)^T}; \tag{11.2}$$

and Equation (11.3) for the renter's total costs;

$$PV_{L0} = \sum_{t=1}^{T} \frac{R_{Lt}}{(1+r)^t} + C_{L0} + \frac{C_{LT}}{(1+r)^T}. \tag{11.3}$$

In these equations, the move-in date is designated 0 and the move-out date is designated T. The two equations are the discounted costs of occupancy for the buyer and renter for the T periods of occupancy. H refers to the homeowner and L to the renter (R has been used, so L, for landlord, is used, although the costs are those of the tenant.) C stands for transactions costs and the subscripts indicate whose transactions costs are represented and when they are incurred.

R_H refers to the owner's periodic cost of capital,

$$R_{Ht} = r_m M_t (1 - T_y) + T_{Rt} V_t (1 - T_y) + eV_t - DM_t. \quad (11.4)$$

Equation (11.4) is similar to Equation (10.6). *VM* is the mortgage-interest rate and *Mt* is the mortgage balance. Because mortgage interest is deductible, the after-tax mortgage interest cost is $1-Ty$ times the interest payment, where *Ty* is the owner's marginal income tax rate. *TR* is the real estate tax rate, relative to the property's value *V*. It is also deductible. *e* is nondeductible maintenance, insurance, and repair costs per dollar of the dwelling value. *DM* is the mortgage principal payment.

At time of purchase, the home buyer must lay out the transactions costs C_{H0} plus the downpayment V_0-M_0. At the time of sale, the seller receives the sale price less the terminal mortgage balance and the transactions costs C_{HT}. The discount rate is *r*, and it should equal the owner's foregone (that is, the return the owner foregoes by investing in the home) after tax return on the equity in the home.

Equation (11.3) is much simpler, since none of the renter's costs are deductible. *Rt* is simply the rent the tenant pays the landlord, and the two transactions costs are incurred at the beginning and at the end of occupancy.

For any given anticipated occupancy length, the tenure status should be chosen that has the smaller PV_0. Because the subject here is the portfolio choice, not the consumption decision, it is assumed that the two dwellings are similar and have the same value *V*. As has been shown, the division between owner-occupancy and rental status is demand-driven, and any dwelling will be sold to a landlord or to an owner-occupant according to who offers the largest amount for the dwelling, which depends only on the *PV* comparison.

If the purchase decision is made, the dwelling must be financed. It is assumed that the buyer obtains a conventional fixed-interest fixed-term mortgage. The periodic payment for principal and interest is

$$P = r_m M_{t-1} - DM_t. \quad (11.5)$$

The first term on the right side is the interest payment and the second is the principal payment (*DM* is the principal payment, so it is negative, and $-DM$ is the principal reduction. Any calculator with a financial mode can calculate *P* if *rM*, M_0, and the term of the mortgage are entered.)

Unlike Equation (10.6), Equation (11.2) does not include the capital gains term. The reason is that Equation (11.2) contains explicit time trends, and capital gains are recorded when they are received. The capital gain (or loss) on the dwelling is $V_{HT} - V_{H0}$, and the discounted value, if there is any increase in price, is included in Equation (11.2).

A numerical example will illustrate how the equations can be used to make the decision to rent or buy. The parameter values used are shown in Table 11.1. The parameters chosen are realistic, but they vary from one situation to another. Dwellings with a purchase price of

Table 11.1 *Base Case Parameter Values (Flow Parameters at Annual Values; Dollar Figures in Thousands)*

V_0	Purchase price	\$200.0
M_0	Initial mortgage	\$150.0
r_M	Mortgage interest rate	0.1
t_y	Marginal income tax rate	0.28
t_r	Real estate tax rate	0.02
r_E	After-tax discount rate	0.072
n	Nondeductible ownership costs	0.02
V_{Ht}	Property value in year t	$V_0(1.05)^t$
R_L	Rent to value ratio	0.07
C_{H0}	Transaction cost at purchase	$0.05V_0$
C_{L0}	Transaction cost at time of renting	$0.02V_0$
C_{HT}	Transaction cost at sale	$0.1V_T$
C_{LT}	Transaction cost at end of rental	$0.02V_T$

\$200,000 are considered. That price is about twice the national average, but the conclusion is unchanged in this analysis if V_0 and M_0 are both raised or lowered in the same proportion. It is assumed that a mortgage for \$150,000 is obtained if the purchase option is chosen. The mortgage is for 30 years, at a 10 percent interest rate, which is a little high at the time of this writing. A lower mortgage-interest rate, however, would lower not only the homeowner's costs but also the landlord's costs, and competition would force the landlord to pass the savings on to tenants.

How long an occupancy should a family expect to make a purchase a better form of tenure than a rental? The answer is the smallest value of T for which Equation (11.2) is less than Equation (11.3). For the parameter values in Table 11.1, the answer is 7.5 years. For any shorter occupancy, the higher transactions costs of owner-occupancy outweigh the fact that P_{Ht} is less than P_{Lt}. Of course, other parameter values give different results. Perhaps most surprising, if the tax rate is 15 percent and all other parameters retain their values in Table 11.1, it does not pay to buy, regardless of the length of occupancy.[7] The deductibility provisions are simply not worth enough in tax savings to justify the higher transactions costs of purchasing than renting. Of course, other parameter values might justify ownership for a sufficiently long residency. However, a lower priced dwelling with a proportionately smaller mortgage would not change the result, as has been pointed out.

Finally, it must be pointed out that people do not become owner-occupiers simply as a financial investment. Other reasons can be summarized by the term "pride of ownership." That term covers several feelings. One is simply the ability to tell friends that you are a more substantial community member than others are. Probably more important is the greater control over one's life that owner-occupancy provides. It enables one to move at one's wish instead of at the landlord's wish, it

7. The discount rate r is the after-tax rate, so it must be raised if the tax rate is reduced.

avoids small squabbles with landlords, and it avoids periodic disputes over lease terms. Of course, owner-occupancy has its problems, specifically being responsible for repairs, maintenance, and hazard insurance. Each person must weigh these issues on an individual basis. The numerical analysis, however, indicates that if you have a modest income, owner-occupancy is probably justified only in unusual circumstances.

☐ Summary

Housing finance is extremely sophisticated in the United States. Many kinds of mortgages are available. Which is the most desirable depends on personal and market circumstances. Homeownership is a large investment. It is risky both because real estate asset prices fluctuate and because ownership is usually highly leveraged. Careful calculations are needed to determine whether ownership is justified and what is the best kind of mortgage to obtain.

Under the twin pressures of high inflation and financial market deregulation in the 1970s, an explosion of new and sophisticated mortgage instruments occurred. These new instruments have greatly increased the efficiency of the mortgage market by offering consumers a wider array of options and by enabling lending institutions to diversify their portfolios by selling their mortgages on the securities market.

Questions and Problems

1. Some people have proposed that the federal government institute a tax credit for first-time homebuyers. The buyer would be allowed to deduct a percentage of the home's value before computing tax liability. What would be the effect of such a credit on the decision to rent or buy? What would be its effect on housing demand?
2. How would you compute the optimum leverage for an owner-occupied home?
3. In inflationary times, ARMs become more common relative to FRMs. Is that because of the borrowers' or the lenders' preferences? Why?
4. Suppose the federal government wanted to revise the personal income tax system to make tax liability neutral with respect to owning and renting. What would you suggest?
5. Canada does not provide the tax preferences for owner-occupancy that the United States provides, yet ownership in both countries is about the same. Why?

References and Further Reading

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