

Illinois Real Estate Letter

The Taxpayer Subsidy of Freddie Mac

James F. Gatti and Ronald W. Spahr

By 1989, following the collapse of the savings and loan industry, US taxpayers were on the hook for between \$132 and \$200 billion to cover the insolvency of the Federal Savings and Loan Insurance Corporation (FSLIC).¹ The S&L insurer, commonly known as "fizzlick," lacked sufficient funds to cover required payments to depositors.² The Bank Insurance Fund (BIF) of the Federal Deposit Insurance Corporation (FDIC), FSLIC's commercial bank counterpart, also became insolvent, in 1991. BIF liabilities exceeded assets by \$7 billion, and the US General Accounting Office (GAO) projected that the deficit would rise to almost \$22.5 billion by 1995.³ The fund was able to cover insured deposits in failed banks and avoid bankruptcy only because of its explicit backing by US taxpayers. Since there was little doubt that the BIF would make good on its obligations, it was able to continue operations while higher deposit insurance premiums generated sufficient cash inflows to rebuild its solvency.

Risky Business

The deposit insurance crisis was not supposed to have happened. It was expected that government and quasi-government agencies, such as FDIC and FSLIC, would protect taxpayers by supervising the banks and S&Ls they insured. They were to see to it that their charges operated in a sound and prudent manner, and did not

take excessive risks. Both deposit insurers seemed to perform these functions adequately for almost 60 years. However, losses resulting from a combination of interest rate risk and credit risk finally destroyed FSLIC, and almost destroyed FDIC. Congress responded by passing a variety of reform measures that, if implemented as intended, should make future deposit insurance debacles very unlikely.⁴

Unfortunately, other organizations created by the federal government, and carrying explicit or implicit government guarantees, also have the potential to cause financial crises, and their regulation leaves much to be desired. In the pages that follow, we first examine the general structure of these *government sponsored enterprises*, or GSEs. We then present an estimate of the potential cost to the taxpayer of the implicit guarantee for one of the largest GSEs, the Federal Home Loan Mortgage Corporation (FHLMC, or Freddie Mac). Finally, we offer a proposal for limiting that cost.

Our results indicate that the regulatory structure under which Freddie Mac operates has reduced, but not eliminated, the financial risk borne by the taxpayer. By bearing a portion of the risk, taxpayers are subsidizing Freddie Mac's operations, and that subsidy represents a substantial portion of Freddie Mac's reported net income. We also find that the level of financial risk is only modestly sensitive

A Farewell to Quarterly Issues

We can no longer offer quarterly publication of the *Illinois Real Estate Letter*. Even the semiannual production schedule followed from mid-1992 through 1996 is in question. We will publish on an irregular basis as long as funding is available. We are committed to creating at least four more issues over the next few years, which we will be able to produce and distribute thanks to a generous Mortgage Bankers Association grant.

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Illinois Real Estate Letter (formerly *ORER Letter*) was published quarterly from 1987 until mid-1992, when the state redirected money that had been pledged to ORER into other accounts. ORER survived with severe cutbacks in personnel and activities, and was able to resume quarterly *Illinois Real Estate Letter* publication in 1997 only with supplemental private funding, primarily from the Mortgage Bankers Association. Now that *Illinois Real Estate Letter* is ORER's sole activity, nothing else can be cut. We welcome inquiries from anyone interested in sponsoring *Illinois Real Estate Letter* publication on a temporary or ongoing basis.

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to the level of *capitalization* (money invested by parties not relying on the implicit government guarantee). The only way to completely eliminate subsidies would be to sever all links between Freddie Mac (and, by implication, the larger mortgage based GSE, the Federal National Mortgage Association, known as FNMA or Fannie Mae) and the federal government. We estimate that eliminating the federal subsidy would raise these GSEs' underwriting costs sufficiently to allow additional private sector competition.

It is often claimed that value of the subsidies to Fannie Mae and Freddie Mac is offset by the benefits of lower interest rates enjoyed by people who borrow money to buy homes. This remains an open question, which we do not address, although a word of caution is in order. A reduction in mortgage loan interest rates is a decidedly mixed blessing. First, as interest rates fall, the amount of capital devoted to housing increases; we see the effect in the form of both more and larger homes. Second, if more capital is used in housing, the amount available for other projects (like new plant and equipment, or research and development) must decline. Smaller volumes of plant and equipment mean that labor productivity, and therefore labor income, will be lower than it would otherwise have been. We could debate the desirability of trading larger houses for lower incomes, but it should be clear that lower mortgage loan interest rates come only at a price.

An Alphabet Soup of GSEs

A government sponsored enterprise, as defined in the Omnibus Budget Reconciliation Act of 1990 (OBRA), is a private corporation that operates under a charter granted by Congress. While most GSE directors are elected by the private shareholders, a limited number are appointed by Congress and/or the President. GSEs primarily make loans or issue loan guarantees to targeted groups of borrowers.

The first GSEs were the First and Second Banks of the United States, whose histories date to the early 1800s.⁵ Almost a century then passed before the next GSE, the Federal Land Bank System (FLBS), was established in 1916. Like virtually all subsequent GSEs, the FLBS was a response by Congress to a belief

that private capital markets failed to serve the needs of a segment of society (with FLBS, the farm sector). While the accuracy of that perception can be disputed, it clearly has led to the creation of elaborate systems for providing financial subsidies to housing, agriculture, and education.

Congress established Fannie Mae in 1938 as a federal agency to create a secondary market for, and thereby encourage lenders to make, fixed-rate government-insured (Federal Housing Administration, or FHA) home mortgage loans. It was privatized in 1968. Congress created Freddie Mac in 1970 as a corporation owned by the Federal Home Loan Banks, to provide a secondary market for conventional (without government backing) home loans. Its stock became publicly traded in 1989. Both organizations are now GSEs, owned by private investors. Their ongoing federal ties, in the form of US government board members and lines of credit, cause the investing public to view the government as a guarantor when these private companies issue securities, though Washington has never explicitly pledged its resources to assure payments on Fannie Mae or Freddie Mac debt.

The two housing GSEs have come to constitute an especially powerful presence in the mortgage lending market. In 1996 and 1997 they purchased 48% and 44%, respectively, of all US home mortgage loans originated.⁶ In light of the implicit federal guarantees that accompany their status as GSEs, Fannie Mae and Freddie Mac face very little competition in the market for securitizing conventional mortgage loans that conform to their underwriting standards/limitations.⁷ GSEs are also secondary market buyers for 73% of all agricultural loans (through the Farm Credit System, which includes the Federal Agricultural Mortgage Corporation, or Farmer Mac) and 43% of all student loans (through the Student Loan Marketing Association, or Sallie Mae).

The consequence of all this GSE activity in America's lending markets has been to expose the federal government, and ultimately US taxpayers, to the risks associated with farming, residential real estate, and the employment prospects of recent college graduates. GSEs typically have no statutory limitation on the extent of their financing activities. (Exceptions

Policy Perspectives

are the Federal Home Loan Bank Financing Corporation and the Resolution Funding Corporation, established to finance the closure of failed S&Ls – a temporary function, we should all hope.)

According to federal budget figures, total GSE obligations grew from \$11.0 billion in 1955 to an estimated \$1,829.7 billion in fiscal 1999. Table 1 indicates that real GSE activity accelerated significantly after 1980, far exceeding growth in real GNP or real government spending. As a result, GSE activity represents a growing fraction of our productive capacity, and government subsidies to GSEs represent a large, and growing, potential burden on taxpayers. Some analysts argue that the federal deficit's size and rapid growth have limited Congress's ability to institute new on-budget programs to deal with social needs (be they real or imagined). Congress has responded by using GSEs as a substitute for direct spending, since implicit subsidies associated with federal guarantees are not directly reflected in federal deficits.⁸

GSE loans are much like those issued, by commercial banks or other financial intermediaries. A GSE borrows from one group, and uses the funds either to make direct loans to borrowers or to buy existing loans from other lenders. A GSE typically raises funds by issuing its own securities in the financial markets. GSEs also channel credit to targeted sectors by *securitizing* loans. Securitization is a technique, first introduced in the early

1970s, in which a GSE or other institution buys a group of similar loans from the financial institutions that initially made them, and then issues a new security that passes to the holder the interest and principal payments from this pool of loans. The loan pool (mortgage loan pools contain home loans; other pools contain car loans, or even credit card debt) serves as collateral for the *pass-through* securities.

Securitization creates value by providing a market in which loans can be sold after their origination. The increased *liquidity* reduces the return required by lenders, and thus lowers the cost to the ultimate borrowers. In the case of home mortgage loans, the instruments are known as *mortgage backed securities* (MBSs). Their promised cash flows are tied to the interest and principal payments of the loans in the pool. MBSs are issued in the open market by the GSE to cover the cost of buying the loan pool. For the taxpayer, the most important characteristic of MBSs is the guarantee that the GSE will pay all promised interest and principal to the security holders in a timely manner, even if the home owners make late payments or default on their loans.

Whose Problem Is It?

Note that it is the GSE, not the federal government, that guarantees payments. Indeed, GSE securities generally contain disclaimers clearly stating that neither the US government nor any of its agencies guarantee the instruments.⁹ Still, credit

markets *perceive* that the government would not let a GSE default on its obligations. This perception arises from two factors: GSEs are chartered by Congress, and almost all GSEs are so large that they are believed to be "too big to fail."

Any questions about the existence of an *implicit* guarantee have been eliminated by federal actions in recent years. First came the Farm Credit System (FCS) bankruptcy.¹⁰ The financial health of FCS, created in 1917 to supplement private sector lending to farmers, has varied with that of the agricultural sector. FCS experienced severe financial crises during the early 1920s, the Great Depression, and the 1980s.¹¹ The most recent episode was triggered by imprudent lending between 1970 and 1980, when farm income and farm land values rose by more than 80%. Borrowers and lenders expected land values to keep rising rapidly, and FCS (like some state agencies) lent at interest rates up to 500 basis points below market.¹²

This aggressive lending, based on land values that many saw as unsustainable, was a recipe for the disaster that followed.¹³ When the bubble burst, loans defaulted, and FCS losses exceeded \$4 billion.¹⁴ With many FCS lending units insolvent, Congress passed the Farm Credit Act of 1987. The Act authorized federal Treasury guarantees for up to \$4 billion on bonds to be issued by the Farm Credit Financial Assistance Corporation, proceeds of which were to shore up the finances of insolvent FCS units.¹⁵

Table 1: Obligations of the Eleven Existing Government Sponsored Enterprises (Millions of Dollars)

	1970	1975	1980	1985	1991	1996	1999 (est)
Student Loan Marketing Association	N/A	N/A	N/A	N/A	N/A	\$46,367	\$28,322
College Construction Loan Insurance Assn.	N/A	N/A	N/A	N/A	N/A	\$268	N/A
Department of Education GSE Total	N/A	N/A	N/A	\$8,600	\$38,900	\$46,635	\$28,322
Federal National Mortgage Association	\$15,200	\$30,000	\$55,200	\$148,900	\$441,600	\$636,362	\$860,950
Federal Home Loan Mortgage Corporation	N/A	\$5,700	\$21,700	\$112,300	\$379,400	\$471,310	\$467,437
Department of HUD GSE Total	\$15,200	\$35,700	\$76,900	\$261,200	\$821,000	\$1,107,672	\$1,328,387
Banks for Cooperatives	N/A	N/A	N/A	N/A	N/A	\$2,704	\$2,604
Agricultural Credit Banks	N/A	N/A	N/A	N/A	N/A	\$17,927	\$20,030
Farm Credit Banks	N/A	N/A	N/A	N/A	N/A	\$47,625	\$52,511
Federal Agricultural Mortgage Corporation	N/A	N/A	N/A	N/A	N/A	\$603	\$1,663
Farm Credit System GSE Total	\$13,200	\$28,400	\$63,000	\$69,100	\$56,200	\$68,859	\$76,808
Federal Home Loan Banks	N/A	N/A	N/A	N/A	N/A	\$281,728	\$356,771
Financing Corporation	N/A	N/A	N/A	N/A	N/A	\$8,463	\$8,447
Resolution Funding Corporation	N/A	N/A	N/A	N/A	N/A	\$30,962	\$30,948
Fed'l Home Loan Bank System GSE Total	\$10,500	\$16,400	\$37,300	\$74,400	\$143,400	\$321,153	\$396,166
Overall Totals	\$38,900	\$80,500	\$177,200	\$413,300	\$1,059,500	\$1,544,319	\$1,829,683
Growth Rate		107%	120%	133%	156%	46%	18%

Or consider the federal government's disturbing tendency to intervene to prevent the failure of other large, highly visible entities that get into financial trouble. Lockheed, Chrysler, and New York City are prime examples. However, the most troubling is the FDIC's inconsistent treatment of failed banks. When a small institution fails the FDIC typically covers deposits only up to the \$100,000 statutory limit, forcing uninsured savers to share in the losses. Yet when large money center banks have become insolvent, FDIC has virtually always arranged for other banks to assume responsibility for all deposits in exchange for financial assistance, allowing uninsured depositors to avoid any losses. In the Continental Illinois case, when a viable merger was not possible, the FDIC used "open bank assistance." This technique essentially amounts to nationalizing a bank deemed "too big to fail," by recapitalizing it with taxpayer funds. This action was justified by assertions that losses would have been even greater in the financial panic that would have followed the failure, liquidation, and costs to uninsured creditors.

Whether or not that assessment is correct, the consequence is to give uninsured depositors and other creditors of large, visible banks a 100% guarantee on their claims. Aside from placing smaller banks at a gross competitive disadvantage, the "too big to fail" policy eliminates the discipline private creditors normally impose on management's risk taking. The FDIC has come under increasing attack for this stance from several quarters, most notably the banking industry itself. It is unfortunate that no reform proposals go so far as to completely forswear "too big to fail" as a policy option.

Bank regulators refuse to go "cold turkey," instead promising to use the "too big to fail" drug only as a last resort. Since they are the ones to determine the meaning of "last resort," their promises have a hollow ring. At best, the proposals shift costs from FDIC to the Treasury and Federal Reserve, doing nothing to reduce either the burden on taxpayers or the subsidy to larger institutions.¹⁶ If an agency of the federal government will not allow uninsured claimants to take losses even when an explicit insurance guarantee clearly excludes them from coverage, it

is not surprising that the investment marketplace holds the opinion that those who lend to large quasi-governmental bodies will be saved from default.

In addition to implicit guarantees, GSEs may benefit from explicit regulatory preferences, such as tax relief, exemptions from SEC rules, and access to US Treasury lines of credit. Because GSEs generally compete directly with firms that are truly private, the implied credit guarantees and other preferences amount to subsidies that leave GSEs with lower capital and/or operating costs than their unprotected competitors face. The value of this subsidy, like the value of the insurance that investors receive through the implied federal guarantee, is paid for by American taxpayers.

A reduction in mortgage loan interest rates is a decidedly mixed blessing: we see more and larger homes, but if more capital is used in housing, the amount available for plant and equipment, or research and development, must decline.

Formalized Informality

Until OBRA's 1990 passage, no statute formally established the GSE as a separate federal entity. The term was coined by federal budget analysts to describe a type of organization that was neither public nor private, but had an implicit budgetary impact. The closest Congress had come to formalizing GSEs' existence was the Government Corporation Control Act of 1945, which established different budget procedures for government organizations depending on their function and ownership structure. Agencies that were owned entirely by the US government, and that produced revenue-generating services, were given greater budget flexibility than were other federal agencies.

Rather than severely restricting the expenditures of quasi-private operations, Congress permitted agencies with these special characteristics to submit budgets that were basically just business plans. Further, if the organization was fully privately owned even this requirement was waived, and no budget submission was needed.¹⁷ The rationale for differing treatment was that tight annual budgets would prevent quick responses to chang-

ing market conditions, thereby reducing operations' effectiveness and efficiency, and imposing even greater burdens on the federal budget. Despite the informality of its origins, the concept has become part of investment lexicon. At least one organization openly touts its GSE status as a major competitive advantage.¹⁸

Concern over federal obligations to GSE investors extends well beyond the extent of the guarantee. Perhaps more important are GSEs' impact on budgetary controls, and the manner in which GSEs are supervised. If Congress decides to subsidize a given activity because it is believed to be particularly meritorious, financial guarantees may be appropriate. Unfortunately, failure to include the cost of contingent guarantees "above the line"

in the federal budget removes powerful restraints on federal spending. Direct subsidy programs would face careful scrutiny by, and stiff opposition from, advocates of competing activities if typical budget constraints applied. While only the hopelessly naive would expect such competition to eliminate unnecessary subsidies, all but the most cynical would expect some moderation. Further, because existing policy requires very limited oversight, there is no effective mechanism to prevent abuse of the guarantee through GSEs' expansion of activities and/or assumption of added risk.

Faced with established organizations whose activities are under only limited federal control, but which impose big risks to US taxpayers, Congress included in 1991's budget proposal a credit reform initiative, that would "... charge the true economic cost of credit – the present value of the subsidy – to any agency making or guaranteeing loans."¹⁹ The goal is to treat guarantees and direct spending equally, to let the government assess costs and benefits more accurately, to allocate resources more efficiently, and to structure programs more effectively.

Freddie Mac and MBSs

One of the largest GSEs (though somewhat smaller than Fannie Mae) is Freddie Mac. Freddie Mac was established to increase credit availability in the home mortgage market. The private shareholders elect 13 of Freddie Mac's 18 directors; the remaining five are appointed by the President of the United States.²⁰ Congress maintains a direct relationship between privately owned Freddie Mac (and Fannie Mae) and the public sector by placing Freddie Mac (and Fannie Mae) under the supervision of the Secretary of Housing and Urban Development. Freddie Mac also retains a US Treasury line of credit of up to \$2.25 billion. These linkages make Fannie Mae and Freddie Mac unique among publicly traded US

guarantees timely payment of interest and principal on the underlying loans. The sale of notes therefore is conditional, with ownership reverting to Freddie Mac if the ultimate borrowers default; thus Freddie Mac should think of MBSs as liabilities.

Because of its operational structure, Freddie Mac's risk, and by implication the US government's, is of two types: default (or credit) risk and interest rate risk. Freddie Mac must bear the credit risk no matter how it finances the notes. If it does not sell a note after having borrowed to finance the purchase, and default occurs, Freddie Mac is left owing the borrowed funds but owning an asset worth far less. If the note is sold, Freddie Mac still loses because it must make good on losses suffered by MBS buyers.

GSE securities generally contain disclaimers clearly stating that they are not government guaranteed. Still, credit markets perceive that the government would not let a GSE default on its obligations.

firms, and are the reason that the capital markets view Fannie Mae and Freddie Mac obligations as free of default risk.²¹

Freddie Mac's essential function, like that of its sister Fannie Mae and cousin Ginnie Mae (GNMA, the Government National Mortgage Association, a true government agency that largely provides payment guarantees on mortgage backed securities), is to increase home loan availability by establishing and maintaining a secondary market for the instruments.²² It does this by buying mortgage notes from originators, financing its acquisitions either by issuing ordinary bonds or by securitizing the notes (selling mortgage backed securities). In 1997, 74.3% of all Freddie Mac-financed loans were securitized, compared to 92.8% in 1992.²³

The MBS, in its various forms, represents an ownership interest in the underlying notes that the borrowers signed, but Freddie Mac treats these notes, for accounting purposes, as having been sold. Consequently, neither the notes nor the MBSs used to finance them appear as assets or liabilities on Freddie Mac's balance sheet. This treatment is an accounting fiction, because Freddie Mac

Interest rate risk exists only when long-term notes are financed with short-term borrowing. In this situation, Freddie Mac is hurt by a rise in market interest rates, just as S&Ls were badly hurt when interest rates spiked two decades ago. Higher interest rates reduce the values of notes purchased in the past, because those notes provide coupon interest payments lower than the market calls for. After all, who would pay face value for a \$100,000 loan that earns 7% when new loans yield 8%? Because the securities that Freddie Mac issues are short-term, their interest rates rise with market conditions, and their prices do not fall as much as do mortgage note prices. When assets drop more in value than liabilities do, Freddie Mac's own net worth falls.

Because Freddie Mac keeps only about a fourth of the notes it finances for its own portfolio, credit risk is a substantially greater concern than is interest rate risk. The federal government is insulated from this credit risk by four factors: borrowers' home equity, Freddie Mac's loan loss reserves, Freddie Mac's own equity capital, and the geographic diversification of the loans that underlie the securities.

Freddie Mac will not buy a note with a loan-to-value (L/V) ratio above 80% unless the excess debt is covered by private mortgage insurance (PMI). Because of loan amortization and increasing real estate values, the average L/V on sold and retained notes was estimated to be 66% at the end of 1993. At the end of 1997, loss reserves were \$694 million, while book value of equity was \$7,521 million. Freddie Mac estimated its equity capital (adjusted for interest related value changes) at \$5.6 billion before taxes, or \$5.2 billion after the estimated tax liability.²⁴ Purchased loans' geographic distribution is roughly proportional to population distribution, a reasonable proxy for the geographic distribution of residential construction activity and the housing stock.

Freddie Mac bears virtually no interest rate risk on its securitized financing, because MBS interest payments are tied to interest paid on the underlying notes. Consequently, market values of the assets rise and fall by the same amount as market values of the contingent liabilities.²⁵

A Capital Idea

Seeing the potential risk associated with Fannie Mae and Freddie Mac, Congress passed the Federal Housing Enterprises Financial Safety and Soundness Act (FHEFSSA). This 1992 law establishes the Office of Housing Enterprise Oversight (OFHEO), assigning it the responsibility to regulate the two housing GSEs. This act is the first, and so far only, positive step taken to limit the risk imposed on taxpayers by any GSE. The regulatory structure established by FHEFSSA is similar to that for banks and thrifts. First, the Act limits the range of activities in which Fannie Mae and Freddie Mac may engage. Second, it requires each entity's capital base to be large enough to absorb foreseeable operating or capital losses.

To meet the second requirement, the housing GSEs must hold core capital (essentially, common stock) equal to at least 2.5% of on-balance sheet assets and 0.45% of the unpaid balance of securitized notes. If capital falls far enough below this minimum standard, the GSE's top management is to be replaced by a team designated by OFHEO – unless OFHEO decides that such action would seriously destabilize financial markets.

Were it not for the disastrous experience with *forbearance* (not imposing regulatory remedies, in the hope that things will improve) in the S&L debacle, this exception would not be so troubling. Unfortunately, the evidence is all too clear that regulators, and Congress, have every incentive to delay needed action in the hope that any problem will resolve itself. This issue is especially troubling in Fannie Mae/Freddie Mac's case. Because of their GSE status, the two so dominate the home lending market that they are widely believed to be "too big to fail."

Whether the stress test established by FHEFSSA is appropriate is debatable. The conditions suggested are severe. The question is simply whether those conditions cover enough possible economic

scenarios to adequately reduce both the risk imposed on taxpayers and the resulting subsidy conferred on the GSE. To answer that question, we developed a mechanism to estimate the value of the subsidy to Freddie Mac, and used that framework to estimate the subsidy's sensitivity to changes in the level of capital.

happen in a deep, prolonged economic recession. During such a period, real estate's market value would fall substantially; many homes would be worth less than the principal still owed on the notes. Under these conditions, borrowers would have little incentive to continue paying on their loans, and defaults would rise sharply. When default occurs, Freddie Mac forecloses and tries to sell the home. Unfortunately, all other mortgage lenders try to do the same thing. The sudden rise in homes for sale drives prices down even farther, imposing huge losses on lenders. This result, seen in Texas during the mid-1980s, added significantly to the losses associated with the S&L crisis.

Using our method of pricing insurance, we estimate that the market value

can not be assessed fully in this article, but it would certainly increase financing costs for the housing GSEs, exposing them to increased competition from private securitizers, and possibly raising the cost of home loans nationwide. Based on the estimates above, potential increases in mortgage interest rates would be trivial, amounting to no more than about 0.08%.

If the goal is to maintain the federal government's stabilizing presence in the housing market by allowing Fannie Mae and Freddie Mac to keep their GSE status, then there are two alternatives for reducing the subsidy's cost: higher capital requirements and insurance fees. Both will cause GSE costs to rise, leading to increased private sector competition and higher home loan interest rates. Our results indicate that higher primary capital requirements would be at least partially effective. A 1993 increase in Freddie Mac's primary capital of \$9.80 billion, or 20%, would have reduced that year's burden for the implicit guarantee from \$377 million to \$167 million.

Charging a guarantee fee equal to the value of the subsidy would have the same effect as would imposing higher capital requirements. In 1993 Freddie Mac reported net income of \$786 million, net loans of \$55,476 million, and securitized loans of \$439,029 million. These figures suggest an annualized rate of return on mortgage loans of 0.159%. Requiring a guarantee fee would have forced Freddie Mac to raise its 1993 management fee from approximately 0.237% to 0.32%. Yet while the impact of the fee option would be similar to that of privatization, charging a guarantee fee may be preferable to privatizing. If the GSEs were privatized, any stabilizing influence of the implicit federal guarantee would be eliminated. If that influence is valued by society, then charging the housing GSEs a fee for an explicit guarantee may be a better plan than privatizing them.

The fourth course of action is simply to recognize the cost of the subsidy on the federal budget. The subsidy could be justified as a means of stabilizing the mortgage market and lowering housing finance costs. As major players in the home loan securitization market, Fannie Mae and Freddie Mac have been largely responsible for making mortgage capital

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Value of the Implicit Guarantee

Our approach (see "The Value of Federal Sponsorship: The Case of Freddie Mac," *Real Estate Economics*, Fall 1997) values the guarantee the same way insurance companies set their premiums. This methodology recognizes that there may well be times when actual losses exceed levels ever seen in the past. In other words, our model allows for the chance that both the number of defaulted loans (frequency) and the amount of loss on each default (severity) could be much higher than anything experienced previously. This outcome would be especially likely if frequency and severity problems were unusually high simultaneously.

To see the importance of potential correlation between default's frequency and its severity, consider what would

of the subsidy received by Freddie Mac in 1993 was approximately \$377 million, or 48% of the organization's net income. At that time, Freddie Mac's capital was almost 20% more than the minimum required under the new regulations. Thus, even the new regulatory structure has not come close to eliminating the subsidy, and American taxpayers are still at risk from the operations of Freddie Mac (and, by implication, those of Fannie Mae).

Policy Alternatives

There are four alternatives for dealing with the subsidy received by housing GSEs: privatize the GSEs, impose user fees, increase the capital requirements, or leave the subsidy in place, reporting it as an expenditure or a contingent liability in the federal budget. The choice depends on societal goals. If the goal is simply to structure GSEs in ways that eliminate the implicit subsidy, the most straightforward solution is complete privatization: eliminate the GSEs' federal charter, end all preferential treatment by public authorities, and remove from the boards all publicly appointed directors. The long run consequences of this action

more available, and for making mortgage notes highly liquid. The implicit federal guarantee, and the subsidy associated with it, have played major roles in fostering the growth of these GSEs and, in turn, of the secondary mortgage market.

While the private sector certainly could have created a secondary mortgage market without federal subsidies, the growth probably would not have been as rapid. Thus, the subsidy's benefits are distributed between two groups: private sector borrowers, who enjoy lower interest rates on their mortgage loans, and the owners and managers of the housing GSEs, who operate in a market with competition limited by the federal subsidy. The nature of the distribution between the two groups is unknown, but the very existence of a benefit to the mortgage lending market may provide justification for the federal government to recognize, on the budget, that a subsidy exists.

Conclusions

This article offers a discussion of government sponsored enterprises, especially Fannie Mae and Freddie Mac, and examines the widely held belief that the federal government would make investors whole if a GSE were unable to pay its debts. We develop a methodology for estimating the value of the implicit guarantee that Freddie Mac enjoys against default loss. The methodology is based on a combination of actuarial and option pricing models. We estimate that the value of the government's subsidy to Freddie Mac was almost \$400 million in 1993.

Whether the subsidies to Fannie Mae and Freddie Mac should be eliminated by privatization, reduced through stricter capital requirements, charged back to the housing GSEs as user fees, or simply recorded in the federal budget as part of the cost of maintaining a strong housing market is subject to debate. Any of the first three courses of action would likely cause mortgage loan interest rates to rise, increasing private sector competition, but reducing the indirect subsidies that home owners receive. Whether opportunities for efficiency gains from increased competition are sufficient to offset the lost subsidy is unknown. The choice among the alternatives is a function of the goals that society wants to achieve. ■

Notes

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9. Omnibus Budget Reconciliation Act of 1990, PL 101-508, November 5, 1990. This disclaimer is repeated in Title XIII of FHEFSSA, and in financial and operating reports issued by all GSEs.

10. Thomas H. Stanton, *Government Sponsored Enterprises: Their Benefits and Costs As Instruments of Federal Policy*, Association of Reserve City Bankers, 1988.

11. For additional information on the history of the FCS, see Charles R. Geisst, *Visionary Capitalism*, Praeger, New York, 1990, Ch.5.

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17. Harold Seidman, "Gov't Sponsored Enterprises," *Public Budgeting & Finance*, Aut. 1989, 78-80.

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20. *Financial Inst. Reform, Recovery, and Enforcement Act*, Pub. Law 101-101-73, Aug. 9, 1989, 431.

21. See, for example, Eric Hemel, *Fannie Mae and Freddie Mac: How Large are the Risks of Higher Capital Requirements?* First Boston Equity Rsch, February 21, 1990; and Edward S. Caso, Jr., *Fannie Mae Freddie Mac*, Goldman Sachs, March 1, 1990.

There are four alternatives for dealing with the housing GSEs' subsidy, depending on societal goals: privatize the GSEs, impose user fees, increase the capital requirements, or recognize the subsidy in the federal budget.

22. Ginnie Mae, or the Government National Mortgage Association, is not a GSE, but a government agency; consequently, its obligations carry the full faith and credit of the US government.

23. *Information Statement*, Federal Home Loan Mortgage Corporation, March 31, 1998, 10. The figure used to calculate the retained mortgage portfolio excludes those loans that back multiclass debt securities. These loans are not securitized, but the nature of the multiclass instrument used to finance them means that they impose no interest rate risk on Freddie Mac.

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25. What little interest rate risk exists in the securitized part of the operation comes from two sources: reinvestment of cash flows prior to disbursement, and the 45 day delay between the purchase of notes and the sale of participation certificates to finance them. For more detail on the institutional characteristics of Freddie Mac and other GSEs, see James F. Gatti and Ronald W. Spahr, "The Burden of Government Sponsored Enterprises: The Case of Freddie Mac," *Cato Public Policy Studies*, Cato Institute, Washington, DC, April 13, 1992; *Information Statement*, Federal Home Loan Mortgage Corporation, April 9, 1993; Thomas H. Stanton, *A State of Risk*, Harper Business, New York, 1991; and United States Treasury, *Report of the Secretary of the Treasury on Government Sponsored Enterprises*, Washington, DC, May 31, 1990.

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Income Taxes On Real Estate: A Graphical Exposition

Peter F. Colwell and Carolyn A. Dehring

Nearly every real estate principles, real estate finance, or real estate investment text provides a discussion of the income tax impact of owning and selling income producing property. Procedures for calculating such important measures as an investor's cash flow, adjusted basis, equity reversion, and capital gain are almost always presented, but only in the form of an equation that enumerates revenue and expense items. While this presentation style has become standard, getting to the substance of the underlying issues can be such a disjointed process that students might easily lose sight of the big picture.

In the pages that follow, we offer a method for *visualizing* the federal income tax treatment of the cash flows and sale proceeds generated by income producing real estate. We think of this graphical presentation as a complement to traditional formula-based approaches, facilitating a better understanding of the economics of income taxation than the mere memorization of formulas allows.

Taxing Regular Periodic Income

Suppose an investor buys an income producing property, such as an office building. Any analysis of this investment's success should focus on the economic returns the investor realizes after paying the applicable income taxes. An investor's returns consist of both cash flows from operations and amounts received when the property is sold, and both of these components, net of appropriately measured expenses, have federal income tax implications for the property owner.

Consider, first, the property's ordinary cash flows. These dollar flows represent amounts remaining from a year's rent and other revenues after various operating expenses, including local property taxes, have been subtracted. A building's owner receives rent for the space tenants occupy, but also incurs various costs in maintaining the property, in keeping with market standards and specific lease provisions. The property's net operating income (NOI), a measure of the owner's economic benefit over a year (or other period), is analyzed in Figure 1.

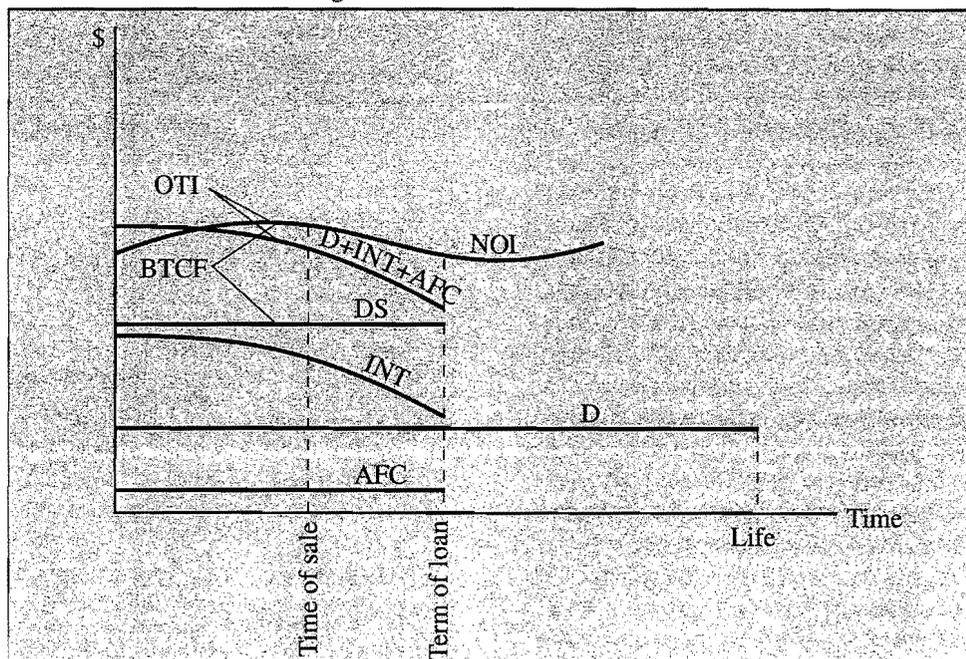
The formulaic definition of NOI is *effective gross income* (the total receipt of revenue the owner realized during the measured period, after taking into account unrented space and amounts lost through disputes or bounced checks) minus the period's operating expenses. Note that NOI is shown to change over time. The reason for the expected change is that neither rent revenue nor operating expenses tend to remain stable over time. Rental revenues can vary as a result of changes in vacancy or in rental rates, while operating expenses might fluctuate because maintenance and repair costs, utility prices, property taxes, or management priorities change over time.

The investor obtains debt financing to fund a portion of the property's purchase price, and consequently makes periodic payments of interest and principal to the lender. The *debt service* (interest plus a portion of the principal) payment is denoted DS in Figure 1; this amount is shown as constant over time, reflecting our use, in this example, of a mortgage loan with a fixed interest rate and a constant payment. The difference between NOI and DS is defined, both in traditional formulas and in our graph, as the owner's before-tax cash flow (BTCF).

To find the investor's periodic return from operations, we must find the amount of income tax due and then deduct this amount from BTCF. Here, as in formulaic analyses, to find the income tax liability we multiply *operating taxable income* (OTI) by the average percentage rate the investor pays as tax on ordinary income. OTI is computed as net operating income minus the combined sum of depreciation, the interest component of debt service, and annualized financing costs.

Depreciation, D in Figure 1, is a deductible expense that reflects the period's share of the cost of the building's being "used up" over time. The amount of the depreciation deduction is determined by the amount originally paid for the property's improved portion (land is not depreciable) and by the property's depreciable life. Depreciable life is an administered figure that need not reflect true economic loss in value. Current US federal income tax law does not permit the rapid and accelerated depreciation writeoffs that characterized some real estate investments in the early 1980s; depreciable life is now 27.5 years for income producing residential property, and 39 years for office buildings and other non-residential property. Furthermore, all real estate

Figure 1: Cash Flow Illustration



must be depreciated on a *straight-line* basis over the permitted depreciable life. Straight-line depreciation is the reason why our graph shows D, like DS, as an unchanging periodic amount over time.

The interest component of the debt service payment, however, changes over time. The function shown as INT in Figure 1 is curved, downward sloping and *concave* in shape. The representation of interest slopes downward because, on a standard fixed rate loan, the outstanding principal balance (on which interest is paid) declines with each successive payment period; its concave shape reflects the increasing rate at which principal declines. Finally, annualized financing costs (AFC) represent points and other one-time fees paid when the loan is originated; such amounts spent to obtain financing for commercial property are deducted straight-line over the loan's life (points paid to obtain a home loan generally are fully deductible in the year the loan is closed). Note that INT and AFC are expensed over the loan's term, whereas depreciation is subtracted each year over the property's depreciable life.

An interesting aspect of real estate investment is that a profitable income producing property may generate tax-saving losses, rather than taxable income, during the early years of the investor's holding period. Before-tax cash flow is positive, but the property produces losses "on paper," and thereby reduces its owner's income tax bill. (Unless the owner is also the property's hands-on manager, measured income and losses are both treated as "passive" under the tax law. Thus the desirable outcome of tax-based losses along with cash-based income can occur only if the investor has some real estate that creates passive income – presumably property that has been held for numerous years – against which the "paper" losses can be offset. We must also recognize that overpriced or poorly managed properties can generate *negative* cash flows, along with tax-saving losses.)

Eventually, as Figure 1 shows, NOI exceeds the declining total that can be deducted from NOI in computing taxable income, creating a positive income tax liability. After-tax cash flow (ATCF) for the property in any operating period is then equal to BTCF minus the income tax.

The Reversion: Debt Analysis

Whereas straightforward Figure 1 represents the taxation of operating income, more complex Figure 2 facilitates analysis of the income tax impacts of selling income producing real estate after holding it as an investment for some number of years. The nature of Figures 1 and 2 offers a stark visual lesson that resale is a more complicated income tax issue than is periodic income, despite what intuition or simple textbook examples might lead people to think. Resale is complicated because so many different and interrelated values can affect the key resale based measure of investment success: the *after-tax equity reversion* (ATER). ATER is the amount, net of income taxes, that the investor keeps when the property is sold.

Resale is a more complicated income tax issue than is periodic income, despite what intuition or simple textbook examples might lead people to think.

Figure 2 focuses around a vertical axis that measures dollar values. To the right of the vertical axis are shown values relating to the property, and to the financing of the purchase, as time passes. Most prominent among property-based values is the *adjusted basis*, AB, which equals the owner's original investment in the property minus any depreciation that has been recognized on the improvements' value. Most prominent among financing-based values is the loan's remaining principal balance, BAL. To the left of the vertical axis, we use a graphical technique that shows how a property's value is allocated between non-depreciable land and depreciable improvements.

Almost all investment real estate is purchased with a high proportion of debt financing. Therefore, when the property is ultimately sold, the need to repay principal still owed on the loan reduces the amount that goes, before income taxes, into the seller's pocket. The initial loan amount, L, is shown on Figure 2's vertical axis. The remaining principal balance, denoted BAL, represents what remains unpaid of the originally borrowed amount as the loan approaches its term.

The remaining principal balance decreases through time as the borrower makes periodic debt service payments, each of which has a principal component. More specifically, the principal portion of the payments increases at an increasing rate over time, so the remaining balance is shown as a concave function, decreasing at an increasing rate as we move farther into the investor's holding period. Recall that principal's counterpart, the interest portion of each payment, also decreases at an increasing rate over time. Since the interest rate serves as the constant of proportionality in both the interest payment function and the remaining principal balance function, Figure 1's INT curve has the same shape as Figure 2's BAL curve, albeit on a smaller scale.

Of course, a mortgage loan need not be fully amortizing. In a fully amortizing loan, the term (the period over which payments are scheduled to be made) is equal to the amortization period. A fully amortizing loan's payment stream provides for systematically retiring principal, along with paying interest on any principal that remains unpaid from one period to the next. As a result, the principal balance is gradually brought down to zero (as indicated in Figure 2 by the dashed continuation of the BAL curve).

A *balloon* loan, on the other hand, is only *partially* amortizing, with a large payment of principal due at the end of the term. Balloon arrangements give borrowers the benefits (perhaps lower interest rates) of shorter-term loans, while allowing for the lower payments associated with long amortization periods. The loan represented in Figure 2 clearly is a balloon type, since the term is shown along the horizontal axis to the left of the amortization period. The height of the point where downward-sloping function BAL becomes dashed (occurring when the loan's term ends) represents the dollar amount of the expected balloon payment.

Adjusted basis stems from the initial basis. The investor's initial basis IB is the price paid for the real estate itself, plus any "soft" costs the buyer pays (common examples are lawyer, title, or other professional fees, including a sales commission if the buyer pays a broker directly for representation). This initial basis has two components: land and improvements values. Distinguishing between the two is important, because depreciation writeoffs can be claimed only on improvements and, as was shown earlier, depreciation deductions reduce NOI and thereby lower taxable income from operations. The investor thus has incentives to understate the land portion of total property value, and overstate the improvements portion, to maximize depreciation benefits.

(One justification investors can use in separating land from improvement value for federal income tax purposes is the breakdown used by local assessment personnel for property tax purposes. It has been suggested that local assessment officials are motivated to understate land values, while overstating building values, to keep their local constituents happy at the expense of federal income tax coffers. This issue is discussed in more detail in "Ask the Cynical Assessor," *Illinois Real Estate Letter*, Winter/Spring 1993, p. 7.)

In the area left of the vertical axis, Figure 2 shows how the allocation of basis between land and improvements relates to the income tax impact of a sale. In this leftward area, both axes measure dollar values. The dark line emanating from the origin has a slope equal to the ratio of local assessors' land value estimate LV to their total property value estimate TV. If the ratio is 25%, then assessors attribute a fourth of the property value to land. Using this ratio line and a 45° line from the origin, we can relate this property's land value to its initial basis. A dashed vertical line at distance TV from the vertical axis intersects the ratio line at a height equal to LV; it intersects the 45° line at initial basis IB. (The 45° line's significance is that TV and IB should both have equaled market value at the time of purchase. Assessed land value should equal the nondepreciable portion of IB; thus assessed land value to the left of the vertical axis and nondepreciable basis to the right both show as LV.)

Clearly, the book value of land stays constant through time, since land is not depreciable. The investor's adjusted basis (denoted AB in Figure 2), however, does not stay constant through time. It declines steadily as time passes, always equaling the initial basis minus the cumulative amount of depreciation that has been deducted over the holding period (unless major improvements have been made that add to the basis, a possibility ignored in this example). Because depreciation is taken on a straight-line basis, the AB line declines in a linear fashion. The building is fully depreciated at the end of its government determined depreciable life.

The property is ultimately sold for a sales price, shown in Figure 2 as SP. The investor subtracts all expenses incurred

be the capital gain attributable to depreciation writeoffs. The capital gain's appreciation component is computed as NSP minus IB. The distinction between the two components is important because of the Taxpayer Relief Act of 1997. Under its provisions, a capital gain resulting solely from depreciation is taxed at a 25% rate, while a gain attributable to market appreciation is taxed at only 20%.

It should be clear that depreciation does not allow the investor to avoid paying income taxes. Rather, depreciation is a means of converting ordinary income to a capital gain. Total depreciation claimed by the owner is recognized as part of the capital gain when the property is sold. There are two advantages to this conversion of ordinary income to a

Depreciation does not allow an investor to avoid paying income taxes. Rather, depreciation is a means of converting ordinary income to a capital gain.

in the sale, denoted SE, in computing the net sales price, or NSP. The investor uses the net proceeds from the sale to pay the remaining principal balance on the loan and any prepayment penalty. The difference between NSP and these loan-related expenses is called the *before-tax equity reversion*, represented in Figure 2 as BTER. This amount is the value the investor receives as a reversion after selling the property and paying obligations to the lender, but before paying income taxes.

Taxing the Capital Gain

The capital gain (or loss) on the sale of the property is the difference between the net sales price and the property's adjusted basis. The capital gain can be thought of as consisting of two components: the portion attributable to appreciation in the property's market value, and the portion attributable to depreciation's reduction in the adjusted basis. Total depreciation claimed over the holding period is the difference between the initial basis and the adjusted basis at the date of sale. The greater the depreciation claimed while the investor owns the property, the lower will be the adjusted basis, and the higher will

capital gain. First, the tax paid on this amount is delayed. (An offsetting drawback, however, is the time value loss an investor suffers when money spent today does not offset current year income, but rather must be depreciated over many years.) Second, even the higher tax rate for depreciation-induced capital gains is lower than the income tax rate the typical investor must pay on ordinary income.

Finally, there are actually two types of income tax on the reversion: the capital gain tax, and a *negative* tax (a tax savings) that results from deducting the prepayment penalty and any points not yet expensed. Since these deductions are accelerated by the sale, the after-tax equity reversion is conceptually the best place to recognize their impact. The investor's ordinary income tax rate is applied to both the prepayment penalty and the remaining amount of points. The magnitude of these negative taxes directly offsets the capital gain tax. The net tax on the reversion is then subtracted from the BTER, leaving the ATER. After-tax equity reversion (not shown in Figure 2) is the portion of the sale proceeds that actually makes its way into the seller's pocket. ■

The Cost of a Habitat for Humanity Loan

Shelley A. Campbell, Peter F. Colwell, and Joseph W. Trefzger

Habitat for Humanity International (HFHI) has a well deserved reputation for advancing the dream of home ownership. The organization provides each involved family with a new or rehabilitated house at a price considerably below market value, and allows each buyer to pay the low contract price over time through a mortgage lending arrangement. It transfers much wealth, in the form of donated money, labor, and materials, to a tiny group of seemingly deserving program participants. Each beneficiary must contribute, in return, a small amount of labor in producing his or her own home and other HFHI-built houses. HFHI home owners, volunteers, and contributors have acted in the best American traditions of self-reliance and mutual assistance.

An Incomplete Bundle of Rights

Buying through HFHI clearly can be financially beneficial to participating households. At the same time, HFHI purchases (like all subsidized transactions) can be quite financially complex. To protect its own interests, HFHI uses financing tactics that can serve to restrict buyers in disposing of their homes. These tactics include profit sharing clauses and prepayment penalties, neither of which are observed in typical home purchase situations. Yet there also are methods by which subsidy recipients can try to counter these tactics.

Because HFHI uses volunteer labor and local affiliates charge no profit, participants get their homes at prices substantially below market value. HFHI calls the difference between market value and the lower transaction price the *differential value*. Differentials raise troubling issues for all providers of *in-kind* (non-cash) assistance. Consider the thriving illicit market in which people sell food stamps to buy other, unsubsidized commodities. Holding similar concerns, HFHI administrators and donors do not want recipients to find it easy to immediately sell their homes and realize substantial gains; HFHI seeks to improve lives through better housing, not through *arbitrage* profits. As a result, HFHI follows procedures that constrain participants' resale activities.

The current HFHI policy, we should note, does not *explicitly* prevent subsidy recipients from accessing equity in their homes. Instead, the parent organization allows its local affiliates to determine their own policies regarding resale of homes built or renovated by HFHI volunteers. Some affiliates' policies, in fact, are quite favorable to the assisted buyers, allowing them complete and immediate access to their home equity. Other local affiliates are very restrictive, while still others follow policies – as HFHI *encourages* them to do – that fall somewhere between the extremes. In this discussion, we focus on the effects of implementing such “middle of the road” policies, in which the subsidized owners are partially, but not fully, constrained in selling or otherwise disposing of homes they have obtained with HFHI's help.

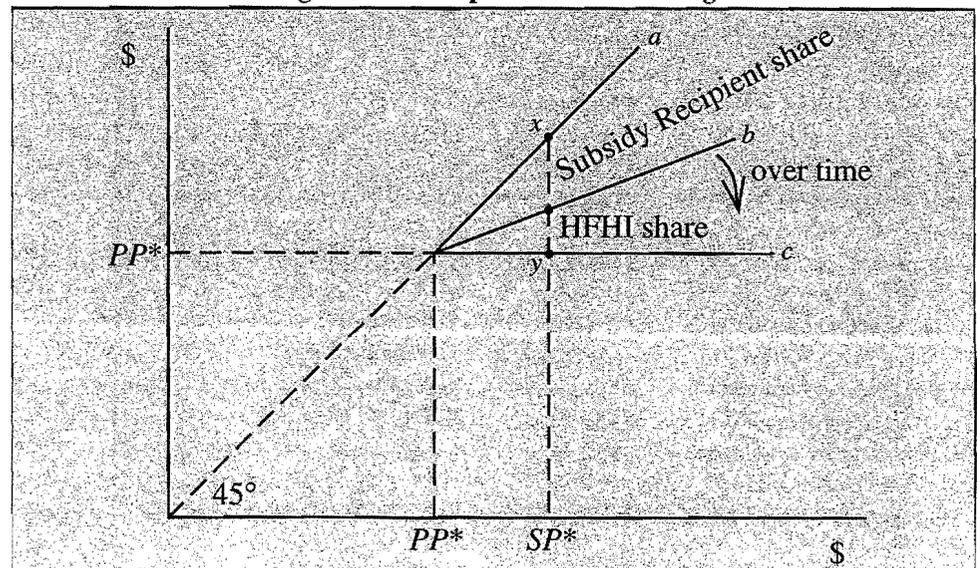
Profit Sharing

One way a local affiliate can partially restrict access to equity is by requiring the home owner, in the event that the home is sold prior to some lengthy specified holding period, to share any profit with HFHI. An approach to facilitating eventual access to equity while discouraging quick resales (“flipping”) involves structuring HFHI's share to decline over time. Consider Figure 1, which compares the home's market value

(the expected selling price, SP^*) to the subsidized original purchase price, PP^* . Since HFHI sells the home to the recipient at a price below its market value, the amount owed to HFHI on the mortgage loan is less than the property's value at the time of purchase even though the buyer is not required to make an explicit down payment. The subsidized buyer therefore receives an immediate infusion of equity – the differential value – and this differential increases over time if the house appreciates in value.

A profit sharing clause's impact on the home owner's profits, in the face of possible value changes, can be seen in Figure 1. The vertical distance between lines a and c shows the expected resale profit, which would belong solely to the home owner if there were no constraints on disposition. Its value is shown as the distance between points x and y (if we assume that the selling price is SP^* , as represented on the horizontal axis). The profit ultimately realized can be greater or less than xy , depending on whether the home's price increases or decreases over time. Line b separates the home owner's share of resale profit from HFHI's; under our assumptions, b rotates downward to increase the home owner's share of any resale profit as time passes. Thus HFHI's share of resale profit declines over time regardless of whether the value changes.

Figure 1: The Impact of Profit Sharing



In light of the profit sharing restriction, an HFHI home loan is, in effect, a shared appreciation mortgage loan, or SAM,¹ although what the owner and HFHI share is the amount by which the resale price exceeds the subsidized initial purchase price (not the amount by which resale price exceeds the higher initial market value). The idea behind a declining equity share for HFHI is to get the home owner to put off selling for a number of years, by which time the diminished HFHI share leaves most or all of the differential value in the owner's pocket. The owner can sell the home at any time and divert part of the subsidy to buying other commodities, but delaying the resale places a greater portion of any differential in the owner's hands. Thus profit sharing should further Habitat for Humanity's goal of providing housing, rather than general financial, assistance to the low income families that participate in HFHI programs.

At the same time, however, restricting the owner's right to dispose of the property can lead to behavior that is not desirable from an economic standpoint.² Our society benefits when those who control valuable assets (such as housing) protect them by making wise maintenance expenditures. If an owner forecasts a need to sell but will gain little from a higher price because of HFHI's high share of the profit, maintaining the home might not make financial sense. Whereas the typical owner rightly spends on maintenance whenever the expected increase in home value is greater than the needed outlay, the Habitat for Humanity buyer has an incentive to provide maintenance only if the *present value* of the owner's *fraction* of expected enhancements to value exceeds the requisite expenditure. If HFHI's share will still be high at the planned sale date, skimping on maintenance could save more than the small amount of gain the owner would realize on resale net of HFHI's substantial share.

The Refinancing Ploy

Of course, it is not necessary for a home owner to sell a house to extract the benefits of a value increase. A more practical means of capturing reversion value might be refinancing the loan. As previously discussed, an HFHI owner who sells may have to share the profit with HFHI. The

owner who refinances, on the other hand, shares the profit with the new *lender*, by paying excessive loan origination fees. When this type of action is initiated at a lender's behest, it is known as *predatory lending*. Yet while the several thousand dollars that the lender might claim in fees could cause many owners (and consumer advocates) to wince, the share that would be paid to HFHI after an early sale might represent an even greater dollar total.

For example, assume that someone obtains shelter through HFHI, paying \$40,000 (the "book value") for a home that would cost \$70,000 in an unsubsidized transaction. HFHI restrictions might prevent the owner from immediately selling the house and pocketing a \$30,000 profit, but an enterprising owner could

In fact, there are no principal payments, either. Instead, a portion of the debt is forgiven each year. As the home owner makes regular payments on the first mortgage loan, HFHI forgives part of the second loan's balance; if HFHI forgave \$250 of the second note's principal for each monthly payment the home owner made on the first mortgage note, the second note's \$30,000 debt would be eliminated after 10 years. Paying any balance on the second loan would be required only if the first lien were paid off before that second lien had been fully forgiven.

This approach effectively deters recipients from refinancing. It should be noted, though, that requiring an additional sum (the second note's balance) from a borrower who pays back the first note's

If Habitat for Humanity's portion of resale profits will still be high at the planned sale date, skimping on maintenance could save more than the small amount of gain the owner would realize net of HFHI's substantial share.

strip equity out of the home by refinancing and paying off HFHI. If the amount refinanced were \$65,000 and \$3,000 were taken by the lender in fees, the home owner would be left with the remaining \$22,000. Had the owner sold the house, the part of the \$30,000 profit remaining after selling costs were paid and HFHI got its substantial share surely would have been less than \$22,000. The refinancing deal would be rational for the owner to accept despite the high costs. It could also be rational not only for the borrower to default after refinancing, but for the lender to *expect* default – and to include its expected cost in the origination fees.

An Effective Trump Card

To prevent buyers from thwarting its intentions by refinancing the HFHI loans, the organization encourages its local affiliates to hold second liens on all the properties they sell. A second mortgage employed in this manner is actually a mortgage loan in name only. This type of second note, sometimes called a "soft mortgage," is executed for the amount of the differential value, and requires no interest payments from the home owner.

principal early is, in effect, levying a prepayment penalty. In Illinois, it is unlawful to impose a charge for prepayment on any loan secured by real estate if the interest rate exceeds 8%.³ Even though loans made by HFHI purportedly carry 0% interest rates, its use of prepayment penalties raises legal and practical questions. Indeed, prepayment penalties on single family home mortgage loans are not typical in the state of Illinois, or in the rest of the nation (one reason is secondary mortgage market buyers' resistance to loans with prepayment penalties).

A visual representation of the second mortgage "loan" is shown in Figure 2. HFHI provides the home buyer with a first mortgage loan, in amount L_1 , whose term is 25 years. The conditional second mortgage loan's initial balance, L_2 , is the differential value that prevails at the purchase date. The sum of the two loans' principal balances is the home's original market value. The second loan illustrated in Figure 2 has a 10-year term. For that reason, the explicit prepayment penalty declines to zero over 10 years. After that time, the owner is free to sell the HFHI-financed home and retain all the profit.

Mortgage Mechanics

Zeroing In

Of course, we can not state in any meaningful economic sense that HFHI finances its homes with no interest charges to the borrowers. It is no more correct to state that a loan is free of interest, simply because there is no separate, explicit interest charge, than it is to state that auto manufacturers do not charge car buyers for brake pedals or steering wheels. The federal government has long understood this logic. The Internal Revenue Service rejects arguments that someone selling real estate under an installment contract with a zero stated interest rate is providing financing that is truly free of interest costs. Instead, the IRS assigns, or "imputes," a reasonable interest rate, with a resulting tax on ordinary interest income to the seller/lender and accompanying deductions for the buyer/borrower.⁴

Because there is always an opportunity cost, and thus there can logically be no such thing as a zero interest loan, it must also be true that the effective principal on a "zero-interest" mortgage loan is not the stated loan amount. Consider an HFHI loan of \$40,000 for a term of 25 years, or 300 months. If there truly were zero interest, all observers could agree that HFHI's computed \$133.33 monthly payment (\$40,000 divided by 300 months) would be the economically correct payment. But if the IRS uses an imputed interest rate of 7%, the effective

loan amount has to be less than \$40,000 (if each payment goes partly toward paying 7% interest, it must be servicing less than \$40,000 in principal). We find the true effective amount of principal by multiplying the \$133.33 stated monthly payment by the *present value of an annuity factor* (PVAF) for 300 months and a monthly interest rate of .58333% (7%/12). Because this annuity factor is 141.486903, the effective principal (the amount of loan retired by 30 years of \$133.33 monthly payments) is only \$18,864.92, not \$40,000. The remaining \$40,000 - \$18,864.92 = \$21,135.08 represents interest paid over the loan's life.

Yet if the borrower wanted to prepay the loan after 36 months, HFHI's required payoff would simply be the \$40,000 ori-

The difference between HFHI's computed balance due and the balance due on the effective loan is \$17,264.97. This difference is a form of prepayment penalty; it exists in addition to any prepayment penalty arising from a second soft mortgage. This effective prepayment penalty on the first lien also gets smaller as the holding period lengthens; recall that the object is to get the subsidy recipient to keep the loan outstanding for a long time. It is only \$9,165.87 if the loan remains outstanding for 10 years, or \$1,266.40 if it survives for 20 years.

The implicit prepayment penalty can easily be visually represented, as in Figure 3. Assume that HFHI provides a participating home buyer with a 25 year, zero-interest first mortgage loan. The vertical

To prevent buyers from refinancing, HFHI holds second liens that are mortgage loans in name only. This type of "soft mortgage" requires no interest payments from the home owner, and a portion of the debt is forgiven each year.

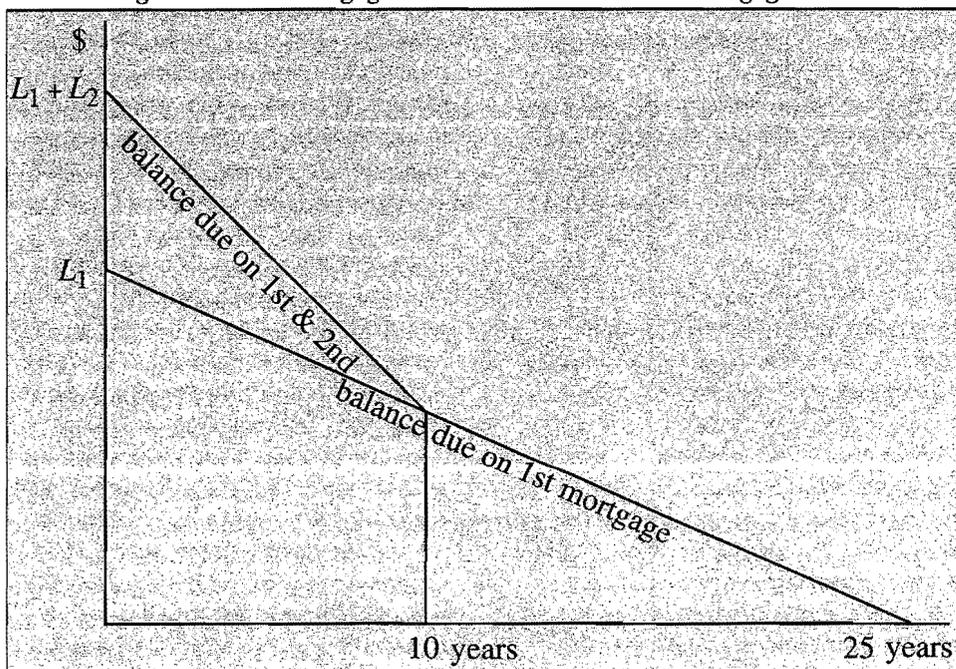
ginal stated principal amount minus the total value of monthly payments made: \$40,000 - (36 x \$133.33) = \$35,200. The balance on the true effective \$18,864.92 loan at 7%, however, is only \$17,935.03 (\$133.33 times the 134.726816 PVAF for a loan of 300 - 36 = 264 months).

axis of the figure shows points L_S and L_e , with L_S representing the stated mortgage loan amount and L_e the amount effectively borrowed. The downward-sloping line representing the balance due on the stated loan (based on a zero interest rate assumption) is always above the curve representing the balance due on the effective loan (with its positive imputed interest rate). Thus there is always at least a slight prepayment penalty associated with a "zero interest" loan. Of course, neither the IRS nor any self-respecting financial analyst would recognize the loan as truly imposing no interest cost.⁵

Taxing Questions

Among the tax implications for an HFHI participant is the treatment of the equity captured when an HFHI home is sold. Someone who buys real estate for less than its market value realizes an immediate gain in wealth equal to the difference between the purchase price and the amount for which the property *could* be sold. However, this difference is not *recognized* as a capital gain for federal income tax purposes until the property actually is sold. This deferral of the tax

Figure 2: First Mortgage Loan and Second "Soft" Mortgage Loan



Mortgage Mechanics

on the gain is a time value benefit to the subsidized HFHI home buyer. However, Congress currently allows a US taxpayer to exclude up to \$250,000 (\$500,000 for married couples filing joint returns) of capital gain arising through a home sale from taxable income. This exclusion is high enough that an HFHI participant would be unlikely ever to face a capital gain-induced income tax liability.

It is also generally true, under our federal income tax law, that the forgiveness of debt is a taxable event; after all, not having to repay borrowed money increases the debtor's wealth. In the case of a soft mortgage, we apply this general rule by reducing the home's cost basis, so that any capital gain eventually recognized on resale will be greater.⁶ Thus

Neither the Internal Revenue Service nor any self-respecting financial analyst would recognize a "zero-interest" loan as truly imposing no interest cost.

even if there is a tax consequence (an unlikely occurrence in light of the high permitted exclusion), deferral of the gain recognition provides the home owner with a desirable time value benefit.

Conclusions

The economic deck is stacked against any provider of in-kind subsidies; recipients may value other goods or services more than they value the subsidized item, and some will take actions, even if improper, to exchange what they have received for cash. The thriving illicit food stamp market exemplifies the problems. In a similar manner, Habitat for Humanity has found that despite its sterling intentions, stellar reputation, selfless volunteers, and broad political support, it must take steps to prevent home buyers from gaining access to their equity under conditions that could thwart the organizational mission.

HFHI faces an interesting combination of incentives. On one hand, its motivations seem anything but financial, in that it freely transfers its own wealth (the value of donated time and materials) to needy families. On the other hand, it must consider, from a financial viewpoint, the

attendant problems. One is that subsidized buyers' "flipping" of their properties for immediate profit would create a public relations nightmare; HFHI could lose donors' enthusiastic support if assisted families seemed more interested in financial gains than in safe housing. HFHI profit sharing rules thus are understandable. Yet at the same time, delayed maintenance (a possible result of profit sharing) could lead to image problems just as severe. After all, HFHI may build many homes in the same neighborhood; their values' systematic decline over time also surely would erode donors' fervor. Perhaps above all, HFHI staff and donors seem loath to see participating home buyers accessing their equity by refinancing through lenders HFHI views as predatory.

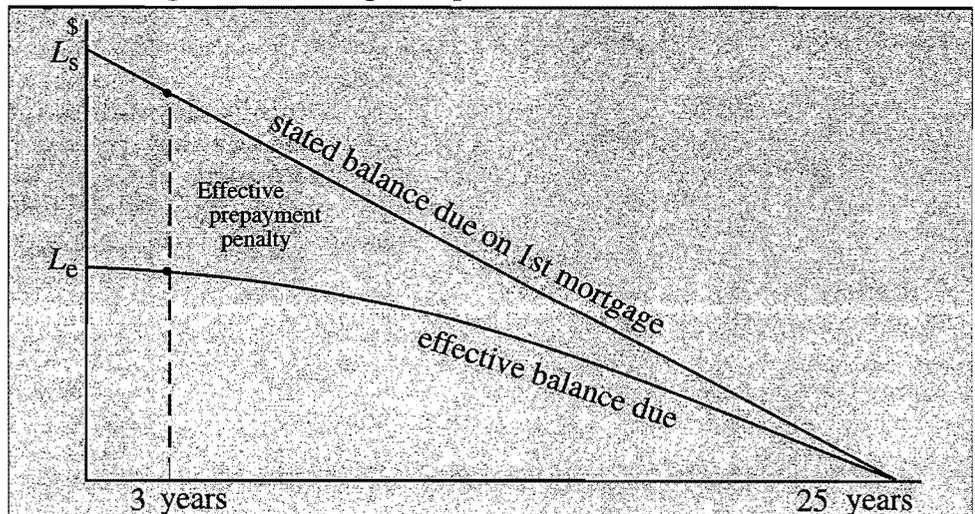
Loss of flexibility in disposing of a home is a cost of obtaining an HFHI loan. It is unfortunate that HFHI's efforts to protect its own interests must constrain the rights of the home buyers that HFHI serves. But in the realm of in-kind subsidies, there are few good alternatives. ■

HFHI's Matthew Hartley provided information on HFHI programs. However, all interpretations and conclusions presented in this article are the authors' alone.

Notes

1. A shared appreciation mortgage loan, or SAM, is an arrangement through which the lender (or perhaps a third party investor) and the home owner split the amount by which the home's appreciated value exceeds the original purchase price. Because the lender or other investor will not want to wait forever for a share of the appreciation, the contract must call for settlement based on an appraised value if the home has not been sold after a stated number of years. Another problem characterizing this type of loan is interference with the home owner/borrower's incentives to maintain or improve the property.
2. Extreme restrictions on disposition can lead to extreme behavior. For example, in the former Yugoslavia it is not unusual for one ethnic group to forcibly remove another group from their homes, with no compensation to the dispossessed. When members of an ethnic group perceive their impending permanent eviction by another ethnic group, they ordinarily leave only the charred remains of their homes for their oppressors to occupy.
3. IL Comp. Statutes, Bus. Transactions Int. Act (815 ILCS205/Section 4), states: "Whenever the rate of interest exceeds 8% annum on any written contract, agreement or bond for deed providing for the installment purchase of residential real estate, or on any loan secured by a mortgage on residential real estate, it shall be unlawful to provide for a prepayment penalty or other charge for prepayment."
4. It is unlikely, however, that someone with a modest home and small loan could realize financial benefits from imputed interest by itemizing deductions. Before the federal government included imputed interest rules in its 1984 tax reform legislation, sellers had incentives to understate interest and overstate principal. The result was to treat more of a transaction's value as a favorably-taxed capital gain and less as ordinary interest income.
5. See Internal Revenue Code, Section 108(e) (5). Note that prepayment penalties are treated as deductible interest in the year paid, although, as stated in note 4, HFHI buyers would tend not to be itemizers. Of course, a large prepayment penalty could, by itself, make itemizing attractive.
6. The zero-interest loan's deductibility to the borrower is accompanied by a requirement that the lender recognize an equivalent amount of interest income. Of course, nonprofit groups like HFHI are not required to pay income taxes. Tax issues relating to zero-interest loans would thus seem largely irrelevant to both sides of an HFHI transaction.

Figure 3: Remaining Principal on Stated and Effective Loans



Come Fly With Me: Bird Property Rights

Peter F. Colwell, Joseph W. Trefzger, and Shelley A. Campbell

We would never duck the opportunity to crow about the need to protect private property, or to grouse about those who find property rights hard to swallow. Thus, we must never be too chicken to pull our heads out of the sand, crane our necks, and draw lessons from the world around us. A cardinal finding of natural scientists is that birds exhibit territorial behavior not entirely different from ours.

Birds Do It

A bird stakes out, and monopolizes, a territory to assure itself enough food. While we without feathers are motivated by reasons beyond sufficient worm and bug supplies, we establish territories in much the same way. The denizen of a prosperous society wants some type of private space as an exclusive domain. While social in nature, humans tend to squawk if our roosts are not independent from others, or at least peep a little about the albatross of congested living. Yet birds and people alike may alter their behavior in different environments. Birds migrating from their northern "summer" homes, for example, often exhibit drastic behavioral changes upon reaching their tropical "winter" homes; those known normally as aggressive, territorial, or nonsocial may become nonaggressive, nonterritorial, or sociable after migrating.

Toucan Play at That Game

Yet far from mocking birds or pigeon-holing them as loony, we admire the way their behavior dovetails with that of humans. People, who chirp for open space and exclusive possession of their homes, sometimes alter their behavior, as well. The change is seen in winter, when snowbirds (an eerily apt name for human migrators) flock to Florida, responding to those who hawk condos and trailers. It is also seen in the summer when, to avoid going cuckoo, many willingly abandon their spacious, private perches on a lark, joining others to nest in close proximity at campgrounds or preen on populous beaches (night owls are gulled in buzzing casinos, while golfers traverse busy links pursuing birdies). Of course, while abundant food in a supportive climate may suppress our feathered friends' territorial needs, people sacrifice privacy toward other ends. Eagle-eyed connoisseurs of choice vacation spots happily put their territorial urges aside over short periods of time, to enjoy limited quantities of prime recreational or cultural space. ■

The authors egged each other on and hatched this article based on pp. 14 - 17 of The Human Nature of Birds, written in 1993 by Theodore Barber and published by - you guessed it - Penguin Books.

"The Taxpayer Subsidy of Freddie Mac" (page 1) discusses the role of government sponsored enterprises in promoting lending to targeted markets, with a special focus on the activities of Fannie Mae and Freddie Mac in the mortgage lending sector. The authors analyze the implications of implicit subsidies that government-related firms enjoy, and describe a method for assigning a dollar value to the implicit subsidy that Freddie Mac received in one recent year. "Income Taxes on Real Estate: A Graphical Exposition" (page 8) offers a graphical presentation to supplement traditional textbook discussions of the income taxes that owners of commercial real estate must pay. The graphs provide visual explanations of taxes paid on ordinary income and on the resale of property; the latter situation is the more complex because of land vs. building values, depreciation, loan amortization, and prepayment penalties. "The Cost of a Habitat for Humanity Loan" (page 12) explains steps that the Habitat for Humanity organization, as a provider of in-kind subsidies, takes to stop its recipients from gaining immediate access to their donated equity. These steps impose a cost by restricting the owners' ability to dispose of their properties. "Come Fly With Me: Bird Property Rights" (page 16) compares humans' seasonal and situational approach to territoriality with that of our avian friends.

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