

Real Estate Market Institutions in the United Kingdom: Implications for the United States

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Abstract

The characteristics of the recently stressed U.K. housing and real estate markets are compared with market behavior and performance in the United States. Four distinguishing characteristics are examined: the mortgage instrument, long-term price declines, asset derivatives, and a privatized secondary market. In the United Kingdom, lenders shift interest rate risk to borrowers since the market for selling this risk is limited. The market is circumscribed by the inherent characteristics of the prevailing endowment mortgage and the absence of implicit government guarantees for default risk.

To improve liquidity, the United Kingdom has attempted to develop derivative markets for house equity. It has also created a secondary market by privatizing mortgage-backed security guarantees. Both nascent markets have policy implications for house and mortgage credit risk in the United States.

Introduction

Standard and Poor's bond evaluation assigns credit ratings based partly on a simulated performance under a replication of the Great Depression. The U.S. Department of Housing and Urban Development's regulatory policy for the secondary market agencies—Fannie Mae and Freddie Mac—is partially based on such scenarios, regardless of the likelihood of another major depression. Regulatory policy may neglect the more relevant and current experiences of other economies. This article examines housing and real estate markets in the United Kingdom, which have undergone stress in the 1980s and 1990s, and how the characteristics of these U.K. markets compare with behavior and performance of those in the United States.

This article studies four characteristics of the U.K. real estate market: the prevailing mortgage instrument, the consequences of a long-term decline in house prices, and two innovations in secondary markets that affect the homeowner's housing asset

and mortgage liability. The United Kingdom has attempted to establish futures and options markets for several real estate assets, including houses. On the liability side, a secondary market for mortgages has evolved without either explicit or implicit government guarantees against default. In hedging the risk of real estate prices and privatizing mortgage-backed security guarantees, both nascent markets in the United Kingdom have policy implications for house and mortgage credit risk in other countries, including the United States.

Between 1988 and 1993, house prices in the United Kingdom fell cumulatively by over 20 percent, based on separate indices of the Halifax and Nationwide Anglia building societies.¹ A separate index constructed by the Department of the Environment did not decline in nominal terms until 1993 or in real terms until 1990. More complete data would involve repeat-sales indices or hybrid repeat and hedonic price indices. Some of the reasons advanced for the protracted downturn are speculative bubble buying, particularly in the southeast around London; the lack of amortization in the prevailing instrument; the tightening of tax policy on mortgage interest deductibility in August 1988; and the impact of high real interest rates and restrictive monetary policy on the cash flow of all homeowners as opposed to purchasers only.²

During the 1980s, the dominant effective lender of record on home mortgages in the United States shifted from thrift institutions to the three secondary market agencies: Fannie Mae, Freddie Mac, and the Government National Mortgage Association (GNMA). While house prices in the United States did not decline from 1988 to 1993 as they did in the United Kingdom, the U.S. situation shifted in the early 1990s. Separate repeat-sale house price indices constructed by Freddie Mac and Fannie Mae reveal a decline in the rate of appreciation; both showed only a 1 percent rate of growth in 1991 and 1992. A slower growth of house prices with an unchanged standard deviation increases the risk of default.

While liquidity on the mortgage debt side has become institutionalized in the United States, the British financial market has been unique in attempting to develop derivative markets for real estate. These markets include futures and options trading on

¹ The Halifax Building Society index indicates that prices declined in 1993 and have remained sluggish into 1994.

² The collapse of the market has been chronicled by Muellbauer (1990).

real property equity. In 1991, the London Futures and Options Exchange (FOX) offered futures and options contracts on a house price index.

In addition to its attempts to restore liquidity, the United Kingdom has developed a secondary market for mortgages that has operated without government guarantees. In the United States, government default guarantees support the secondary market and back over 80 percent of all mortgage originations.

This article begins by discussing the conditions underlying the U.K. housing market. It examines the four distinguishing characteristics of the market as they relate to the United States: the mortgage instrument, long-term price declines, asset derivatives, and privatized secondary markets. The discussion presents comparative data for both countries to indicate how the differences in institutions translate into the behavior of prices and quantities in housing markets.

The U.K. market has mixed implications for regulation and performance of housing markets. The experience of homeowners and borrowers during a protracted house price downturn may be more relevant for the private firms involved in setting credit ratings than a repeat of the 1930s depression. While mortgage-backed securities function without direct or indirect government guarantees, the proportion of mortgages securitized in the United Kingdom is well below half the comparable figure in the United States. With limited access to secondary markets, U.K. lenders have been obliged to retain a prevailing contract that minimizes their interest rate risk. The corollary is that interest rate risk is shifted to liquidity-constrained borrowers. In conclusion, the development and retention of a prevailing mortgage instrument may depend on the extent of the secondary market. Lenders in the United States can offer fixed-rate mortgages and shift and resell interest rate risk because of the extensive secondary market.

The U.K. market has experimented with derivatives in real estate assets, as opposed to mortgage liabilities. Futures and options contracts were offered not only on house prices, but also on commercial rents and appreciation. The experiments were unsuccessful, but they may provide regulators and market makers with information on hedging property risk and laying off default losses.

The British housing market

The United Kingdom's homeownership rate was 68 percent in December 1992, up from 57 percent in 1981. Thus the United Kingdom's homeownership rate was higher than that of the United States, which was 63 percent in 1992. Growth in household income, increased competition and access in the lending market, and the provision of a right to buy for previous inhabitants of public rental housing (Bramley 1992) are contributing factors. Regardless of income group, U.K. consumers exhibit a strong disposition toward homeownership: Surveys indicate that 80 percent of households want to become homeowners. Residents tend to buy at a younger age than purchasers in other countries: The average age of a first-time buyer is 27. Additional factors contributing to the United Kingdom's high homeownership rate are rent controls, restrictions on private rental housing, and rising real incomes during the 1980s. Further, owner-occupancy is supported by tax expenditures in fiscal policy. Mortgage interest up to a maximum loan balance of £30,000 (\$48,000)³ per house is tax deductible. In August 1988, the limit was capped on a per-house as opposed to a per-individual basis. Mortgage interest deductibility is charged against the prevailing income tax bracket for a representative household, the standard rate. The standard rate is below the highest rate. Up to this £30,000, homeowners pay mortgage interest on a net-of-tax basis. Imputed rental income is untaxed, and capital gains on housing receive favorable tax treatment.

Diamond and Lea (1992a, 1992b) have examined mortgage finance markets in the United Kingdom and compared them with markets in other developed countries. In general, the U.K. mortgage finance system performed efficiently from an economic standpoint when compared with other countries. Boléat and Coles (1987) have compared the United Kingdom's mortgage instrument with those in other countries, noting the unique role of the endowment insurance policy.

The U.K. mortgage finance market is dominated by building societies, which are specialized financial institutions engaged in taking deposits and originating home mortgages. Building societies accounted for 75 percent of mortgage originations in 1992, reflecting cost-of-funds advantages, product innovation and pricing, and weak competition from other providers, primarily commercial banks. In terms of balances outstanding, building societies had market shares of 62 percent in 1993, 58 percent in

³ The exchange rate used is that prevailing in the second week of July 1994.

1988, and 82 percent in 1980. The remainder of the market share is absorbed by nondepository lenders.

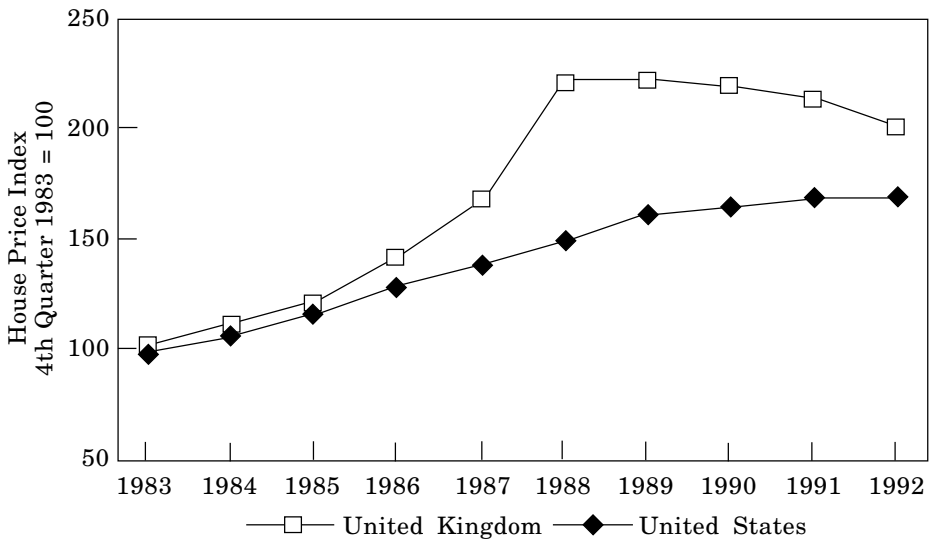
U.K. house prices increased substantially between 1985 and 1988. During this period, house prices rose by 111 percent in East Anglia and by 93 percent in London, while in England as a whole prices increased by 26 percent. During the 1980s, the price escalation accompanied both rising real incomes and gross domestic product growth of 2.3 percent annually in real terms. By late 1988, however, the housing market began to decline in price and volume in the south of England and spread to other parts of the country. Interest rates charged by building societies increased from 9.5 percent in April 1988 to 15.4 percent in February 1990. Real disposable income, which had increased during the mid-1980s, faced an increased rate of decline.

The downturn in the housing market had several consequences. During 1991, 2.3 percent of all mortgages were more than six months in arrears compared with 1.2 percent in 1990. In 1991 and 1992, repossessions totaled about 75,000 each year. The Bank of England estimated that over 2 million homeowners, or about 10 percent of all mortgage borrowers, had negative house equity by 1993. The estimate is obtained by applying a house price index and extrapolating the house prices after 1988. Similar estimates by the brokerage firm Phillips & Drew place the number of negative equity homeowners in excess of 2 million.

During the 1980s price escalation, the ratio of house prices to income increased, as did capital and income gearing (leverage). Mortgage debt for first-time buyers expressed as loan-to-value ratios and payment-to-income ratios increased. The first casualties of the defaults were mortgage indemnity insurers, firms that carry the default risk on the portion of loan-to-value ratios above 75 percent. Sun Alliance and Royal Insurance, the two largest offerers of mortgage indemnity insurance, each lost over £150 million (\$240 million) during 1991.

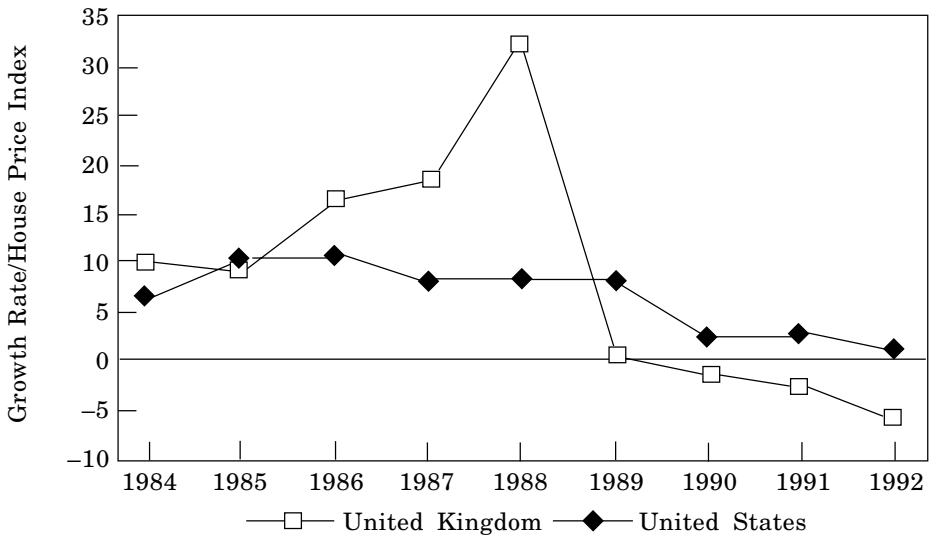
Comparative data on the housing market performance of the United Kingdom and the United States are shown in figures 1 through 4. The price index level for single-family housing in both countries, which is benchmarked at 100 in the fourth quarter of 1983, is shown in figure 1. The U.K. house price index is the national series constructed by the Halifax Building Society. The Halifax and Nationwide Anglia price indices differ, with the latter showing more volatility. The U.S. price index is the national series developed by Fannie Mae, which is based on repeat-sales transactions as discussed in Calhoun, Chinloy, and

Figure 1. House Price Index: United Kingdom and United States



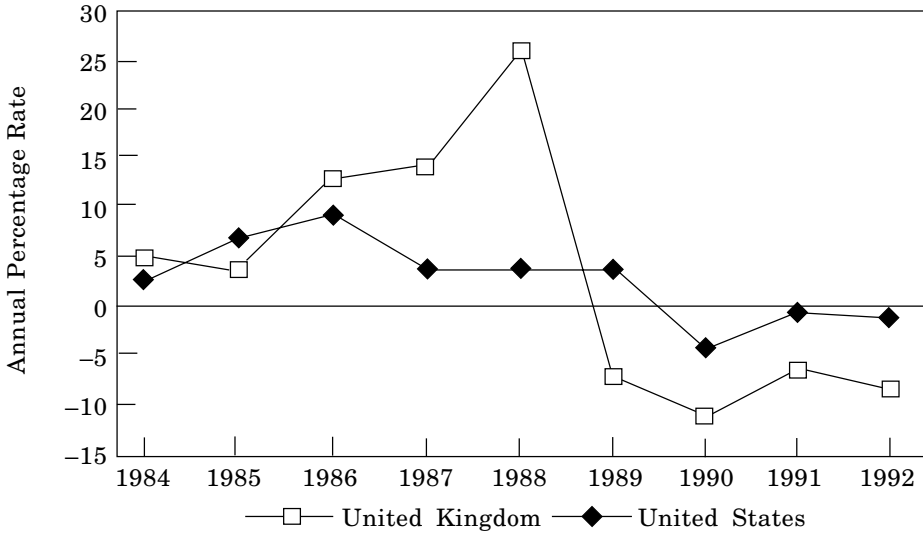
Sources: U.K.: Halifax constant-quality house price index. U.S.: Fannie Mae repeat-sales national house price index.

Figure 2. House Price Growth: United Kingdom and United States



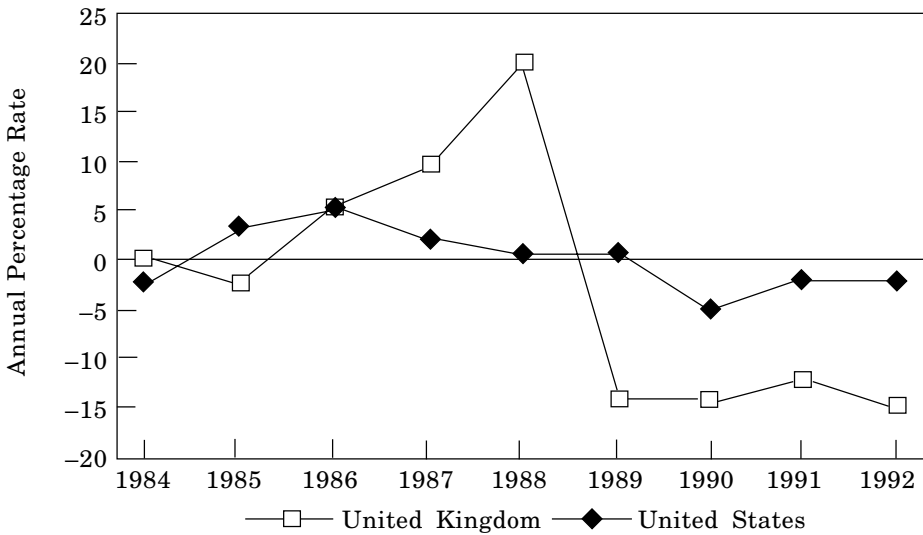
Sources: See figure 1.

Figure 3. Real House Price Growth: United Kingdom and United States



Sources: U.K.: Growth rate of Halifax house price index less growth rate of Retail Price Index. U.S.: Growth rate of Fannie Mae house price index less growth rate of Consumer Price Index.

Figure 4. House Price Premium: United Kingdom and United States



Sources: U.K.: Growth rate of Halifax house price index less yield on three-month Treasury bills. U.S.: Growth rate of Fannie Mae house price index less yield on three-month Treasury bills.

Megbolugbe (1994). The data are matched pairs of house transactions from Fannie Mae's mortgage purchases. The index is constructed quarterly and benchmarked at 1983:4 = 100.

During the 1980s, house prices in Britain increased at a much faster rate than in the United States, albeit with increased volatility. In particular, a rapid rise in house prices between 1986 and 1988 in the United Kingdom was followed by a continuing decline. The U.S. house price index increased at a slower, less volatile rate. Prices increased continuously during the sample period but were only 60 percent greater in 1992 than in 1983.

Growth rates of house prices in the United Kingdom and the United States between 1984 and 1992 are shown in figure 2. The first observation on the horizontal axis is the growth rate over 1983 to 1984. The growth rate of house prices in the United Kingdom exceeded 15 percent annually from 1986 to 1988; however, it declined to zero in 1989 and remained negative after that. The United States demonstrated a more steady growth rate of house prices during the sample period, though the rate never exceeded 10 percent and decelerated in the early 1990s. Both the United Kingdom and the United States exhibited negative real house price growth after 1989 (see figure 3). The U.K. series is deflated by the retail price index and the U.S. series by the Consumer Price Index. The volatility of the British series is accentuated in real terms. The real growth of house prices exceeded 10 percent during 1986, 1987, and 1988 but has fallen below -5 percent annually since 1989.

The house price premium over a short-term interest rate is shown in figure 4. The rate used in both countries is that for three-month U.S. Treasury bills, and the figure compares the performance of housing investment with a riskless asset. In the United States, housing commanded virtually no premium over the riskless asset, averaged over the sample period. In the United Kingdom, house prices increased by more than the riskless rate from 1986 through 1988 but by less than the riskless rate after 1989. In the United Kingdom, housing has been risky to hold. While a risky asset may command a premium, the overall premium is negative for the sample period, and U.K. housing produces a gain below the riskless rate.

Primary mortgage instrument

The prevailing instrument in the United Kingdom, the endowment mortgage, combines an interest-only nonamortizing loan with an insurance policy. The endowment mortgage was attractive during the 1980s and early 1990s because of tax benefits that have subsequently been curtailed. A depository institution offers the interest-only loan, on which the borrower makes a monthly payment over a 25-year period. The interest rate is tied to the lender's base lending rate, which is analogous to the prime rate in the United States. The base lending rate is set by the major clearing banks and is an interbank rate. Building societies set mortgage rates as a margin above their retail cost of funds; this is an average rate rather than a bank base rate. Although the two rates are correlated, neither the marginal nor the average deposit rate is tied to the base rate. The base rate is consequently centrally controlled and thus is analogous to the prime rate in the United States. The two principal types of depository institutions that offer mortgage loans are commercial banks and building societies, with the latter accounting for over 75 percent of originations. Building societies are dedicated home loan lenders much like U.S. savings and loan institutions. The interest-only "bullet" loan is combined with a life insurance policy to pay off the indebtedness if the homeowner dies, thereby providing a method for insurance companies to take a direct role in real estate lending.

On the endowment mortgage, the lender is the beneficiary of the insurance policy. The insurance policy accumulates as a future value. The borrower can also combine the interest-only loan with a life insurance policy and pension account.

The endowment mortgage remains the dominant instrument. Fixed-rate and payment-amortizing loans, similar to the benchmark U.S. contract, account for most of the remainder. For the borrower, the loan is a package of a liability for the interest-only mortgage and an asset for the endowment insurance policy. For the lenders and insurance companies offering the contract, the positions are reversed. The mortgage is an asset, and the insurance policy a liability. The net position is the difference between the two.

The mortgage component is similar to a bond, with a variable interest rate and the principal fully repayable at term. The borrower is allowed to pay the lender an interest rate on a net-of-tax basis, on an amount up to a threshold, thus lowering the

effective interest rate at source. The payment for the balance up to the permitted limit is based on an after-tax interest rate. The interest rate is adjustable and is calculated as the sum of the base lending rate plus a margin.

When a lender's base lending rate changes, mortgage rates for customers of that lender usually change also, although some contracts limit rate and payment adjustments to one per year. Unlike an adjustable-rate mortgage in the United States, the U.K. mortgage is characterized by random interest rate change dates. The U.K. lender may effectively repurchase the mortgage at par and reissue it at a different interest rate at any time. The lender has an American call option to repurchase the loan at its face value and resell the loan to the borrower with a revised market coupon. The call option is exercisable at any date up to the term of the loan.

The base lending rate is set by each lender. Since the base lending rate is revised to reflect the prevailing market rate, there is little point in searching for lower interest rates. A borrower can benefit from prepayment only by finding another lender offering either a lower base lending rate or a narrower margin. These limited opportunities indicate that prepayment and its refinancing call options have limited value. As in the United States, most contracts have no prepayment penalties.

The reduction in prepayment risk comes at the cost of increased default risk. With no amortization, the lender risks not recovering principal if house prices decline in nominal terms. The interest rate risk is shifted to borrowers, increasing default risk from unanticipated shocks from payments risks with mortgage rate tied to the market. Borrowers are typically liquidity constrained and unable to lay off this risk. This situation is similar to the U.S. experience, where default rates are higher on adjustable-rate than on fixed-rate mortgages.

Default insurance is covered by equity, mortgage indemnity insurance, and the lender, in that order. Mortgage indemnity insurance is purchased from separate providers offering coverage against default risk for the "top slice," or initial loss. Loans above an 80 percent loan-to-value ratio require mortgage insurance for the portion above this level. Premiums range from 3.5 to 7 percent of the amount insured, but typically are 4.5 percent payable as a lump sum on mortgages up to 95 percent loan-to-value ratios. Payment-to-income ratios are expressed as a loan-to-income multiple. For example, one underwriting standard establishes loan size as three times income.

The second component of the mortgage is a companion life insurance endowment policy, transferrable across properties. The borrower has a choice of taking a policy with a future value greater than (for profit), equal to, or less than the value of the house. Each month, the borrower makes a combined payment of interest only on the loan and an insurance premium annuity. Since endowment insurance may be separated from the mortgage, borrowers sometimes take out additional and separate mortgage repayment insurance.

The insurance component accumulates as an annuity or as a future value lump sum. Tax treatment of the accumulation has changed, but at one time it was tax free. If the borrower dies before the end of the mortgage term, the face value of the insurance policy is paid to the lender. If the borrower survives to the end of the mortgage term, the loan may be paid off. Unlike the mortgage rate, which is adjustable, the interest rate on the insurance component is fixed and locked in at the beginning of the contract.⁴ In addition to the fixed interest rate, actuarial tables based on the age and sex composition of the household, the term, the loan balance, and the for-profit condition determine the payment. Homeowners make annuity payments to insurance companies, thus hedging against life expectancy. The two components of the U.K. mortgage are analogous to two types of U.S. mortgage instruments. The mortgage component is similar to a commercial real estate loan, while the insurance component is similar to a reverse mortgage.

The standard U.S. commercial real estate mortgage is a non-amortization, interest-only bullet loan originated by portfolio lenders. Commercial construction loans, along with bridge financing and temporary or miniperm loans, have the same features and are usually quoted for the lender at margins over the prime rate or at some other floating rate. The interest rate on the commercial loan is continuously adjusted as the prime rate changes. U.S. commercial mortgages usually have lock-in features that restrict prepayment or are prepayable only if the borrower pays the lender the entire interest rate differential. Credit and liquidity squeezes for borrowers have similar effects in the U.S. commercial and U.K. residential real estate markets.

The endowment insurance component is similar to a reverse mortgage. With a reverse mortgage, a borrower receives a

⁴ The payment also depends on actuarial survival probabilities by the age-sex composition of the borrowers. These are neglected so that payment can be modeled as an annuity.

periodic payment from a lender, building a future value liability. The balance accumulates as a future value secured against the house. With an endowment mortgage, the borrower makes a periodic payment to a lender, building up a future value asset. This mortgage accumulates to pay off a nonamortizing loan balance secured against the house. With separate future value asset and liability accumulations for endowment insurance and reverse mortgages, insurance companies may be able to match the two cash flows. The widespread reliance on endowment mortgage contracts in the United Kingdom represents a potential source of capital to fund reverse mortgages. Insurance companies can reinvest the annuity proceeds and contracts in assets with similar risk based on the life expectancy of the borrowers. This type of reinvestment is an alternative to investments in U.K. government bills or long-term bonds.⁵

A reverse mortgage program provides insurers with an opportunity to match cash flow pipelines. Insurers receive annuity payments and pay another group of borrowers who wish to liquefy their house equity. The insurer receives a premium spread by charging a higher interest rate on the outward payment flow to reverse mortgage borrowers than that paid on endowment mortgages. Endowment mortgage premium income could provide matched funds for reverse mortgages in the United Kingdom and, with appropriate exchange rate hedging, reverse mortgages in the United States.

Default risk

An indemnity payout for mortgage default exposure on a sample house, exclusive of transaction and operating costs, is presented in table 1. The house cost £50,000 (\$80,000) at purchase with a 90 percent loan-to-value ratio. Mortgage indemnity insurance is required and accounts for the example's 17 percent coverage ratio based on a 75 percent threshold. For the first £5,000 (\$8,000), or a 10 percent decline in house prices, the borrower loses all equity. The next £5,000 (\$8,000), or a cumulative decline of 20 percent in house prices, is completely insured by the mortgage indemnity firm.

⁵ Reverse mortgages have been offered on a limited basis in the United Kingdom. In 1989, HUD launched a demonstration Home Equity Conversion Mortgage. The program offers a reverse mortgage with the same loan limit and guarantee made available in forward mortgage programs insured by the Federal Housing Administration. Insurance company endowment funds could provide a source of reverse mortgage capital.

Table 1. Exposures on Mortgage Default (£)

Purchase Price = 50,000	Top-Slice Mortgage Indemnity Insurer	Lender
45,000	0	0
40,000	5,000	0
35,000	7,650	2,350
30,000	7,650	7,350
25,000	7,650	12,350

For default losses up to a decline of about 20 percent in house prices, the top-slice insurer carries virtually all the loss after the wipeout of the borrower's equity (see table 1). At a threshold kick-in, in this case £37,350, coinsurance takes over. After that, the losses of the top-slice insurer are capped because the liability is sold to the lender. Conversely, rises in house prices after they are "under water" have a substantial effect on reducing the liabilities of the top-slice insurers.⁶

For the purchaser at the 90 percent loan-to-value ratio depicted in table 1, a price decline of 20 percent on default would impose a claim cost on mortgage indemnity insurance of £5,000 (\$8,000). This decline is for the average house. Depending on the spread of the distribution, lenders could also be at risk of loss, given that most mortgages are held in portfolios.

Representative residential mortgage contracts are compared in table 2.

Mortgage financing innovations

In view of volatile house prices and default risk, U.K. mortgage market institutions have developed alternative financial instruments. These instruments include graduated payment mortgages and pension-linked mortgages, which invest the principal in pension funds. Modifications to the endowment mortgage include deferred-interest loans. Apart from fixed-rate mortgages, other alternatives include foreign currency-linked mortgages, shared-appreciation mortgages, and reverse mortgages.

To improve the liquidity of both physical and financial real estate assets, futures and options on real estate indices were

⁶ Quigley and Van Order (1992) have evaluated the default risk on mortgages purchased by the secondary market servicer, Freddie Mac.

Table 2. Representative Residential Mortgage Contracts in the United Kingdom and the United States

	United Kingdom	United States
Interest rate	Variable at lender discretion	Fixed or adjustable at fixed dates
Term	25 years	30 years
Amortization	No	Yes
Life insurance contract	Yes	No
Mortgage insurers	Multiline	Single line
Mortgage insurance (minimum loan-to-value)	75% (mortgage insurance guarantee—MIG)	80% (private mortgage insurance—PMI)
Mortgage-backed securities risk weight	50%	0% (GNMA) 20% (Fannie Mae, Freddie Mac) 50% (private)
Default risk	No amortization Limited secondary market carried by MIG first, then by portfolio lender Interest rate risk	Amortization Extensive secondary market carried by PMI first, if applicable, then usually secondary market agency
Prepayment risk	Limited	Limited interest rate risk higher (particularly on fixed-rate loans)

introduced. On May 9, 1991, the FOX launched its property futures market. Its objectives were to provide liquidity to the market and to enable participants to lay off risk. The FOX property futures market offered contracts based on a commercial property index, a commercial rent index, a residential property index, and a mortgage rate index. These products were not well received by the market and on October 1, 1991, trading was suspended after reports of illegal activities came to light.⁷ The commercial real estate futures contracts on the FOX were

⁷ Alternative proposals have been submitted to the London International Financial Futures Exchange (LIFFE) for offering real-estate-related futures and options contracts. Patel (1992) indicates that there may have been basis risk issues in the unsuccessful contract. An alternative stock market index based on the Financial Times Actuaries property index is considered. However, research in the U.S. market for real estate investment trusts suggests that these entities behave more like stocks than property. Case, Shiller, and

traded on the basis of data from the Investment Property Databank (IPD). The IPD publishes time-series on rental and asset prices for different categories of commercial real estate in the United Kingdom. The trading unit was £500 per index point on the last Friday of the month following the contract month. The settlement price was the IPD index. The contract months were March, June, September, and December. The expiration date was the last Friday of the month. The residential house price index used for the FOX contract was the Nationwide Anglia Price Index, a regression-based hedonic price index.

Mortgage-backed securities

Other financing innovations include lender hedging of interest rate risk between the cost of borrowing and the mortgage rate through the use of interest rate futures and options. Another instrument for reallocating the default risk is mortgage-backed securities. These vehicles avoid mortgages being held as portfolio loans. Centralized lenders in the United Kingdom have issued mortgage-backed securities without a direct or indirect government guarantee. The securities permit liquidity and funds to be supplied to the mortgage lending market.

Mortgage-backed securities allow lenders to move the loans off the balance sheet. Such transactions are important for lenders faced with capital adequacy restrictions. The securitization of mortgages involves the creation of either a pass-through security, whereby the mortgage's interest and principal payments are passed through to the holders of the security, or mortgage-backed bonds, which are debt obligations collateralized by mortgages. Pryke and Whitehead (1992) discuss mortgage-backed securities in the United Kingdom.

From the first £250 million (\$400 million) issue in 1987, the mortgage-backed security market grew to nearly £11.6 billion (\$18.6 billion) in 1992 without reliance on government guarantees. All securities are credit enhanced. Diamond and Lea (1992b) indicate that about 75 percent use pool insurance and 25 percent a senior-subordinated structure. With pool insurance, an external insurer is paid to cover default risk for the grouped

Weiss (1992) discuss alternative methods of hedging real estate risk. Shorting stock of real estate firms and real estate investment trusts is not feasible because of thin markets. Another alternative is a home equity insurance program whereby an insurer pays a homeowner if a house price index falls more than a certain deductible amount. This is top-slice insurance on an accrual rather than a realization basis.

mortgages. In a senior-subordinated structure, more common in the private mortgage-backed securities in the U.S. market, default risk is concentrated in specific tranches of a real estate mortgage investment conduit. The senior securities carry almost no default risk, which is channeled to investors in the subordinate issue. The subordinate issue, which carries the default risk, is either retained by the issuer or sold as a below-investment-grade security. The issues have been standardized such that almost all have coupons set quarterly as a premium over the three-month London Interbank Offered Rate (LIBOR). Since underlying mortgage contract rates are set by the base lending rate rather than LIBOR, there is interest rate basis risk. Endowment and repayment mortgages with loan-to-value ratios up to 80 percent and loan sizes between £15,000 (\$24,000) and £150,000 (\$240,000) have been securitized.

The mortgage size is capped at 2.5 times the income of the holder, and the pools require a minimum of 300 loans. A maximum of 50 percent of the pool can constitute mortgages originated in southeast England, and no more than 0.5 percent of the pool can be originated in any one postal code. Further, no more than 25 percent of the mortgages can come from one originator.

Beyond the top-slice coverage and credit enhancement, the underwriting firm or the pool investors may have to carry the default risk. The risk is offset by overcollateralization or by establishing a set-aside to cover interest shortfalls. Both the borrower and the investor in mortgage-backed securities are subject to interest rate risk from the floating rate. In turn, the interest rate on the pool securities is quoted as a markup over the LIBOR. In terms of prepayment risk, homeowners who prepay loans cause the pool to lose this investment. A feature of U.K. issues is that the pool is permitted to use prepayment funds to replace a departing mortgage. Overseas investors are subject to currency risk as mortgage-backed securities are denominated in sterling. Currency swaps and options cannot account for prepayment and default risk, thus leading to potential basis risk.

The cost to the issuer of creating the mortgage-backed security and moving the transaction off the balance sheet is 45 to 50 basis points. The Bank of England announced in November 1992 that mortgage-backed securities would carry a capital adequacy risk weight of 50 percent instead of 100 percent as initially proposed by European Union standards, thereby reducing the cost of carry for depository lenders.

Concluding remarks

Prevailing mortgage contracts differ internationally. In the United Kingdom, lenders shift interest rate risk to borrowers since the market for selling this risk is relatively limited. In the United States, which can point to well-organized markets for selling prepayment risk, borrowers can take advantage of fixed-rate loans. Fixed-rate mortgages insulate existing borrowers from the liquidity squeezes of tight monetary policy. The demand for the housing asset from existing holders is maintained even as nonowners face the tilting adjustment of higher fixed interest rates.

The U.S. mortgage instrument has developed a secondary market for reselling interest rate and prepayment risk. However, the United Kingdom has had a more limited market for mortgage-backed securities because of the inherent characteristics of the interest-only and endowment mortgage and the absence of implicit government guarantees on default risk. Tight monetary policy and high interest rates place immediate squeezes on all mortgage borrowers, who may already be liquidity constrained.

During the speculative bubble of the 1980s, house prices continued to increase cyclically because underwriting standards are not adjusted to cyclical behavior. With rising house prices and a fixed nonamortizing debt, the entire amount of increase shifts into owner equity. With acyclical underwriting standards, borrowers can qualify to trade up, intensifying an upturn. Conversely, in a downturn equity is reduced and owners are unable to sell or move.

The income capitalization rate used to value housing rises with short-term rates, reducing the value of the asset. In the United States, the income capitalization rate for existing owners is unchanged by a lock-in effect. With mortgages prepayable on sale, a homeowner's house is more valuable than any other house on the market. Consequently, house prices in the United States are more sluggish during a downcycle. Borrowers face no payment shock from changing interest rates, and their demand for housing is shifted preferentially to their existing property. Borrowers are less likely to sell during a downturn because of this national mortgage capital gain. The downside pressure on house prices is therefore mitigated.

The same lock-in and payment insulation are absent from the U.S. commercial real estate market, where the standard mortgage instrument resembles that offered in the United Kingdom.

The price index for commercial real estate, as measured by the Frank Russell-National Council of Real Estate Investment Fiduciaries Index, declined continuously from 1990 to 1992. The Nationwide Anglia and Halifax house price indices and the Investment Property Databank commercial index have likewise declined since 1988. These results are not by themselves conclusive; rather, they are suggestive. Nonetheless, despite constraints on real estate markets, liquidity, along with secondary markets and a predominant mortgage instrument that provides borrower insurance against payment changes, has permitted residential housing finance to continue during economic downturns. The insurance is sold to borrowers by buyers of mortgage-backed securities who carry the interest rate and prepayment risks.

A flexible mortgage instrument such as in the United Kingdom may translate into volatile house prices. Borrowers face liquidity and wealth constraints and must reduce their demand for the asset if the interest rate rises precipitously. On the other hand, a rigid mortgage instrument protects the borrower from dramatic house price fluctuations and transfers the risk to the overall financial market rather than to the housing market.

In a completely mobile capital market, a spectrum of mortgage instruments would be available, and borrowers would sort themselves by flexibility and desire for fixed payments and other conditions. In practice, the set of choices is limited partially by explicit restriction or constraint. It is rather difficult to securitize adjustable-rate mortgages, so they have tended to become portfolio liens for U.S. lenders. Cultural and legal, as well as economic, institutions appear to influence the prevailing contract offered.

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