Home Owner Mobility and Mortgage Prepayment

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Many of today's home owners will move within a few years. And among owners of mortgaged homes, there is an additional likelihood that they will pay off their mortgages even if they don't move.

Uncertainty about whether home owners will prepay their mortgages, and the likelihood that borrowers will prepay when rates are falling and investors would prefer not to be paid off, are the key reasons why rates on mortgage-backed securities (MBS) are higher than rates on bonds where there is no comparable prepayment option. Attempts to explain and predict mortgage prepayment rates have been hindered by the fact that MBS investors cannot easily determine why prepayments have occurred.

This article provides some new information on household mobility and mortgage prepayment, based on data from the Census Bureau's American Housing Survey (AHS). By matching up the owner-occupied units in one survey with the same units from the next survey, it was possible to trace what happened to the owners and the mortgages.

The survey reveals that about 15 percent of the people who bought homes in 1985 had moved by 1987, and about 10 percent of all home owners in 1985 had moved by 1987. Over the 1987 to 1989 period the same pattern prevailed, with 15 percent of all 1987 buyers and 10 percent of all 1987 owners moving. The likelihood of a move generally became smaller the longer the family had lived in their home. For example, among the 1985 owners who had lived in their homes since the early 1970s, only about 6 percent moved between 1985 and 1987.

Mortgage rates fell substantially from 1985 to 1987. In addition to owners who prepaid their loans because they sold their homes, another 19½ percent of those who owned mortgaged homes in 1985 prepaid their mortgages but didn't move. More than 9 percent refinanced, but an even larger share (10 percent) paid off their mortgages and owned their homes free and clear. During the 1987 to 1989 period, when mortgage rates were relatively stable, the share of loans paid off was still about 10 percent, but only about 4 percent were refinanced. Even among those whose mortgages were less than five years old, a surprisingly large share paid off their mortgages without obtaining new loans.

Movers

Among all home *owners* in 1989, half had lived in their homes since before 1979. If owners have, on average, been in their homes for half the time they will ultimately live there, that would indicate that owners tend to stay in their homes for about twenty years. Data on housing turnover also suggest an average tenure of about twenty years, since the annual sales equal about 5 percent of the stock. But the group of people *buying* homes at any given time will include a disproportionate share of frequent movers, so the median time a given cohort of buyers will remain in their homes will be less than the median for all owners.

Data on mobility rates of owners by year moved in can be used to estimate an expected length of stay for buyers in much the same way that life expectancy tables are constructed from data on death rates by age. In order to calculate mobility rates for single years, it is assumed that the number of owners moving in one year is half the number for the two years between surveys. Using the data for owners in 1985, assuming that future buyers will move out in their first year in the same proportion as 1985 buyers did in their first year, that those who remain after one year will move in their second year in the same proportion as the 1985 owners who bought in 1984 did in their second year, etc., expected survivorship rates for owners can be estimated. Table 1 shows the results, based on the movement of 1985 owners over the 1985-1987 period and the movement of 1987 owners over the 1987-1989 period. The results indicate that it will take about ten years before half of current buyers move out.

The results in Table 1 imply that owners who have remained beyond the period of highest mobility will stay for a long time. The data based on 1985 owners indicate that among the 48.1 percent of initial buyers who remain after ten years, more than half (27.6 percent) will still be living in the same home after thirty years. The estimates based on 1987 owners show a similar pattern.

Owners probably do not expect to stay in their homes as long as they ultimately do. A recent survey by Barbara Lipman of the National Association of Realtors found that more than three-fourths of current home owners expect to move at least once during the next ten years.[1]

Prepayments

Few long-term mortgages survive until their nominal maturity, which is commonly thirty years. Instead they are prepaid for any of the following reasons:

- the house is sold;
- the mortgage is refinanced (replaced by a new mortgage);
- the mortgage is paid off so that the home is owned free and clear;
- the borrower defaults.

Because of mobility patterns, mortgage prepayments due to home sales are more likely among borrowers who bought their homes within the past few years than among long-term owners, other things being equal.

Most mortgages are due on sale, but some mortgages are assumed by the new owner, although that is generally limited to FHA and VA mortgages. Some conventional ARMs are also assumable. Of those homes in the AHS where an owner-occupant moved out and a renter moved in or the home was vacant, we don't know if the previous occupant still owned the home and kept the same mortgage.

Refinances appear to be the most volatile component of prepayments, and there were many more refinances between 1985 and 1987, when mortgage interest rates fell by more than 2 percentage points, than between 1987 and 1989, when there was little change in rates. In addition to those refinancing in order to take advantage of lower rates, some borrowers refinanced with larger loans in order to tap the equity in their homes.

The most unexpected result to come from the AHS is the large share of mortgages that were simply paid off. For owners with high-rate loans, the incentives to pay off the loans were similar to the incentives to refinance, and anyone with adequate funds might find eliminating a debt with an interest rate of 12 percent or more to be an attractive alternative to investing in a bond or CD paying 8 or 9 percent. The percentage of owners with loans from the mid-1970s and earlier that paid off their loans, however, was significantly higher than the share of borrowers from the high-rate years of the early 1980s. The interest rates on older mortgages were not very high relative to the returns available on investments, but the outstanding balances were much smaller, so paying off the loans was easier.

In addition to loans that are fully paid off ahead of schedule, there are also partial prepayments, called "curtailments," as borrowers pay more than the required monthly payment.[2] The AHS does not directly measure curtailments, although such payments will affect how soon the loan is fully paid off.

The AHS also does not measure mortgage delinquency or default. Most loan prepayments associated

Table 1 Home Ownership Survival Rate

	Based on 1985 Owners		Based on 1987 Owners	
Year	Move Rate	Survivors	Move Rate	Survivors
0		1000		1000
1	7.57%	924	7.57%	924
2	8.28%	848	7.27%	857
3	8.68%	774	7.43%	793
4	7.95%	713	8.57%	725
5	7.54%	659	7.00%	675
6	7.77%	608	5.71%	636
7	6.95%	566	4.82%	606
8	5.77%	533	5.19%	574
9	4.38%	510	5.59%	542
10	5.69%	481	5.01%	515
11	4.61%	458	3.96%	495
12	3.10%	444	3.36%	478
13	3.25%	430	3.81%	460
14	3.21%	416	4.14%	441
15	3.56%	401	3.62%	425
16	3.02%	389	4.06%	408
17	3.20%	377	2.70%	397
18	2.25%	368	2.57%	386
19	2.49%	359	3.49%	373
20	2.69%	349	2.79%	362
21	3.45%	337	3.06%	351
22	2.28%	330	3.36%	340
23	2.18%	323	1.37%	335
24	2.86%	313	3.19%	324
25	2.18%	306	2.46%	316
26	2.51%	299	1.69%	311
27	1.34%	295	1.54%	306
28	1.09%	292	1.99%	300
29	2.51%	284	2.15%	294
30	3.01%	276	2.31%	287

Source: NAHB tabulations of 1985, 1987 and 1989 American Housing Survey data
Note: Move rates are one-half the percentage of movers over a two-year period.

with defaults will appear in the AHS as moves.

Prepayments due to sales, refinances, and payoffs will all be sensitive to interest rates, with lower rates encouraging prepayments and higher rates discouraging prepayments. The relationship between interest rates and default is less clear.

Table 2 shows what happened to mortgages during the 1985 to 1987 and 1987 to 1989 periods. The rows of the table are broken down according to the year that the mortgage was originated, whether or not the loan was made at the time the home was purchased.

The columns of the tables show the disposition of the mortgages over each two-year interval. In cases where the home was occupied by a renter (or was vacant) at the end of the two-year interval, the status of the mortgage is uncertain.

If the home has been sold to a new owner-occupant who has not assumed the old mortgage ("sold"), if the old owner is there with a new mortgage ("refinance"), or if the owner no longer reports having a mortgage ("paid off") then it indicates that a prepayment has occurred.[3]

The results show that about 30 percent of the loans outstanding in 1985 were prepaid by 1987, not counting cases where the home was owner-occupied at the beginning of the period but occupied by a renter or vacant at the end of the period. Of the loans outstanding in 1987, about 23 percent were prepaid by 1989. In both periods, the number of loans that were paid off was greater than the number prepaid because the home was sold to a new owner-occupant or prepaid because the owner refinanced with a new mortgage.

Payoffs account for a smaller share of the dollar value of prepayments than of the number of prepayments because the average loan amount is generally small. The 1985 loans that were paid off had a median original value of $22,000, compared with mortgages of $40,000 on homes sold and $47,000 for mortgages that were refinanced. Taking into account the effects of amortization and curtailments, the difference is even greater.

The cumulative effect of payoffs is apparent in AHS data showing the share of owner-occupied homes that are owned free and clear. Overall, 42.4 percent of owner-occupied homes in 1989 had no mortgage outstanding. Figure 1 shows the percentage of homes with any mortgage outstand-

Table 2 Mortgage Prepayment

YEAR MORTGAGE ORIGINATED	NO CHANGE Same Owner Same Loan *Not Prepaid*	ASSUMED New Owner Same Loan *Not Prepaid*	RENTED Owner Loan *Prepaid*	SOLD New Owner New/No Loan *Prepaid*	REFINANCE Same Owner New Loan *Prepaid*	PAID OFF Same Owner No Loan *Prepaid*
1985–1987						
Before 65	63.7%	0.0%	2.3%	3.3%	3.4%	27.4%
1965 – 69	72.7	0.2	2.3	3.3	4.4	17.1
1970 – 74	75.4	0.4	2.9	5.3	3.4	12.5
1975 – 79	72.0	0.7	5.1	9.1	4.4	8.7
1980 – 81	57.1	1.4	7.7	10.9	15.9	7.1
1982 – 83	51.6	1.8	8.6	12.9	18.8	6.4
1984 – 85	58.6	1.6	7.9	9.1	16.2	6.6
1986 – 87	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	**65.3%**	**1.0%**	**5.7%**	**8.5%**	**9.6%**	**10.0%**
1987–1989						
Before 65	54.4%	0.0%	2.1%	3.6%	3.1%	36.8%
1965 – 69	69.6	0.0	2.7	3.9	2.8	21.1
1970 – 74	75.9	0.1	4.0	5.4	2.4	12.3
1975 – 79	77.9	0.2	3.7	7.5	2.6	8.2
1980 – 81	70.0	1.1	6.4	8.2	4.7	9.6
1982 – 83	64.5	0.8	9.1	10.1	6.7	8.9
1984 – 85	66.1	1.5	7.2	11.7	6.3	7.2
1986 – 87	72.3	1.6	6.6	7.6	5.5	6.4
TOTAL	**71.5%**	**0.9%**	**5.6%**	**7.8%**	**4.4%**	**9.9%**

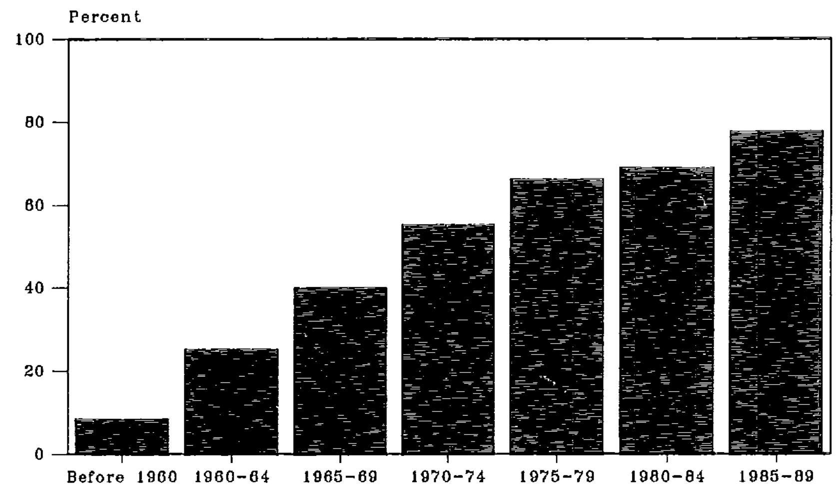
Source: U.S. Bureau of the Census, American Housing Survey, 1985, 1987, 1989. NAHB tabulations.
Note: Based on interviews with owners in units that were owner occupied at the beginning of the period and at the end of period, subject to mortgage with original term of 15 years or more. Paid-off loans originated before 1970 include loans repaid at maturity.

ing, according to when the owner moved into the home. Although these data indicate that many loans are paid off prior to maturity, they don't indicate that the rate at which loans have been paid off in the past was as high as in the 1985-1989 period, as measured by the survey data. If about 20 percent of homes are acquired without a mortgage and 5½ percent of non-movers paid off their loans each year, as suggested by the data in Table 2, then after twenty years only 26 percent of homes would still be mortgaged, rather than the more than 40 percent of homes from the 1965-1969 era that were still mortgaged. Since interest rates during the late1970s and early 1980s were generally higher than the rates on outstanding mortgages, payoffs were probably less common during those years.[4]

Prepayments during 1985 to 1987 due to sales to new owner-occupants represent 8.5 percent of mortgages outstanding in 1985, while the corresponding figure for 1987 to 1989 is 7.8 percent.

During the 1985 to 1987 period, 9.6 percent of the mortgages outstanding in 1985 were refinanced. During 1987 to 1989, however, the share of mortgages that were refinanced was much lower (only 4.4 percent) even though a large number of loans with high rates was still outstanding. The number of loans refinanced during the latter period was less than half the number paid off, and even among loans originated in the 1980s, there were more payoffs than refinances.

Figure 1 1989 Owners with Mortgages By Year Moved In



Source: U.S. Bureau of the Census, American Housing Survey, 1989.

Implications for Borrowers

Investors have come to place different values on MBS issues reflecting not only the coupon rate, but also the age of the mortgages, the location of the properties, the previous prepayment history of the pool, and other factors. Any loss of liquidity due to these distinctions has been more than offset by the ability to tailor securities in such a way as to reduce uncertainty and match MBS to the maturity and risk preferences of investor groups.

As more information about mortgage pools becomes available, and as investors understand prepayment probabilities better, the result could be lower relative costs for mortgage borrowers on average and especially favorable rates for borrowers whose prepayment characteristics are most attractive to investors. Thus, it may be possible, for example, for builders to obtain more favorable terms for their customers if their location, customer demographics, and other factors imply that repayments will be of short duration, predictable, and insensitive to interest rate changes.

The survey data presented here provide new information about the sources of prepayment. Because individual home owners responding to the survey often do not understand the terms of their mortgages and may provide inaccurate information about other variables as well, these results should only be considered suggestive, rather than definitive, but they suggest that prepayment models need to incorporate some additional factors.

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[1]These results will be published in a forthcoming study by the National Association of Realtors in the fall of 1992.

[2]Some analysts use the term "curtailments" to include the full prepayments that we are calling payoffs.

[3]The total number of loans paid off includes loans that reached maturity (i.e., were repaid) as well as those paid prematurely (prepaid). Because only loans with initial terms of 15 years or more were included, none of the payoffs of loans originated after 1970 or 1972 were due to the loan reaching maturity, and even among older mortgages prepayments were more common than loans reaching maturity.

[4]Some homes may have been remortgaged after an earlier mortgage was paid off. The data used in Figure 1 include home equity loans.