

Prepayment Characteristics of Hybrid ARMs

Hybrid ARMs have become popular among borrowers in recent years. Comprising just 1 or 2% of new loans in late 1992 and early 1993, this sector peaked at about 14% of the conventional mortgage market in early 1995.¹⁷ Although falling as a percentage of all new loans since then, hybrid ARMs continued to grow as a percentage of the ARMs market with recent data indicating that the sector probably represents about one-third of new conventional ARMs. Currently, there is about \$7 billion outstanding in agency hybrid ARMs.

Hybrid ARMs fall into four main categories: 3x1, 5x1, 7x1, and 10x1, with 3x1, for example, signifying that the first reset date is after three years, with annual resets after that. Each of these groups are further divided by whether or not the loans carry a convertibility feature.¹⁸ The 5x1 is the most popular of the hybrids, as shown in Figure 4. In fact, 5x1s have recently surpassed the more traditional one-year Treasury annual reset (1x1) ARM in popularity among conventional borrowers.

Figure 4. Hybrid ARM Data (Amounts in Millions)

	Amount Issued	Amount Outstanding	Factor	# of Pools	WAM	WAC
FNMA						
3x1 Non-convertible	\$1138	\$850	77.2%	177	27.6Yrs.	6.53%
3x1 Convertible	1051	689	65.7	109	27.8	6.52
5x1 Non-convertible	\$1997	\$1379	77.5%	179	27.7Yrs.	6.77%
5x1 Convertible	703	586	83.9	40	28.2	6.72
7x1 Non-convertible	\$661	\$560	87.5%	123	28.5Yrs.	7.02%
10x1 Non-convertible	\$156	\$94	84.5%	27	27.4Yrs.	7.34%
10x1 Convertible	66	60	89.9	6	28.7	7.26
FHLMC						
Non-convertible	\$2655	\$1775	69.8%	372	26.7Yrs.	7.39%
Convertible	1599	1124	70.8	165	27.4	7.39

Note: The FHLMC data is for Series 78 pools, which are hybrid ARMs of varying first reset dates.
Source: Salomon Brothers

Recent Prepayments

Being a relatively new product, there is limited prepayment history on hybrid ARMs. Figure 5 shows recent speeds for 1994 and 1995 origination non-convertible hybrid ARMs — also shown are speeds on standard non-convertible one-year Treasury ARMs, and discount balloons and 30-year fixed-rate conventionals.

¹⁷ See *Bond Market Roundup: Strategy*, May 31, 1996.

¹⁸ Hybrid ARMs do not seem to have standardized convertibility features, with some convertible during the first five or six years, others convertible on the first few reset dates, and so on.

Figure 5. Recent Prepayment Speeds on Hybrid ARMs and Other MBSs

	WAC	Age	CPR (%) for Last			
			1 Mo.	3 Mo.	6 Mo.	12 Mo.
1995						
1x1 ARMs	6.83%	14mo.	42.1	37.2	38.3	33.8
3x1 ARMs	6.4	13	14.6	13.8	13.6	-
5x1 ARMs	6.84	13	7.6	7.2	8.7	-
7x1 ARMs	7.09	13	5.3	4.7	7.9	-
10x1 ARMs	7.3	16	3.1	5.9	-	-
5-Year 6% Balloon	6.74	11	10.0	11.6	9.9	6.0
7-Year 6.5% Balloon	7.21	11	8.0	7.1	7.7	6.0
30-Year 6.5%	7.29	11	3.2	3.0	2.4	1.7
1994						
1x1 ARMs	7.50%	27mo.	25.1	26.5	29.3	28.9
3x1 ARMs	6.54	25	13.3	13.4	16.0	14.7
5x1 ARMs	6.89	25	11.5	12.8	16.0	14.8
7x1 ARMs	7.05	25	8.7	8.3	11.0	11.3
5-Year, 6% Balloon	6.54	30	16.0	17.7	16.4	15.0
7-Year, 6.5% Balloon	6.96	29	12.7	12.7	12.9	10.7
30-Year 6.5%	7.08	30	6.0	6.1	6.0	5.0

Note: 1994 origination 10/1s not shown due to insufficient amount outstanding.
Source: Salomon Brothers Inc.

Two observations stand out from Figure 5:

(1) Hybrid ARMs are much slower than standard one-year Treasury ARMs, which are prepaying very fast as their coupons reset upward (notice that the WAC on the 1995s is 6.83%, much higher than the WAC on the hybrid 3x1 ARM — at origination, the one-year ARM's WAC would have been at least 100bp lower).

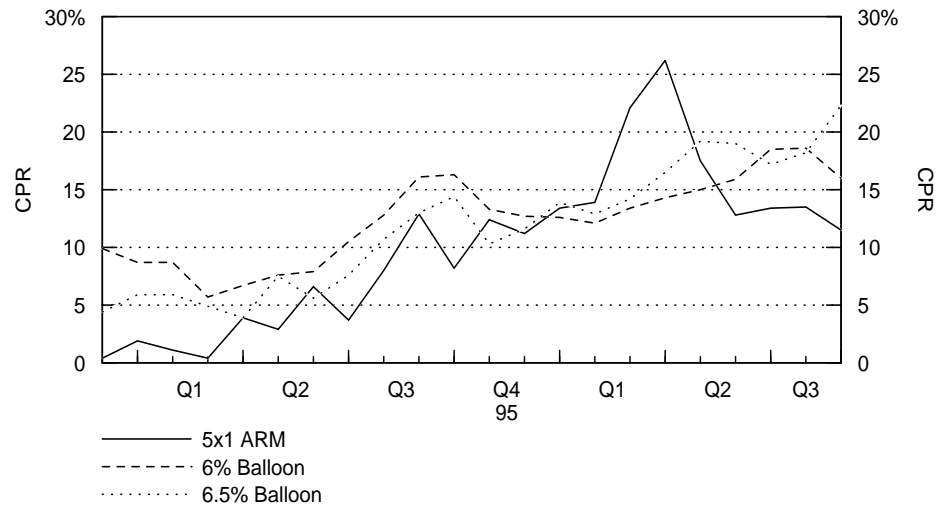
(2) For the hybrid ARMs, speeds decline with the length of the first reset period, with the 3x1s, for example, much faster than 10x1s. This is consistent with anecdotal accounts from originators, who feel that

- Borrowers who take out 3x1 ARMs are probably fairly similar in characteristics to traditional ARM borrowers.
- Those who take out 10x1s are similar to 30-year fixed-rate borrowers, but want the slightly lower rate on a 10x1, and either think they will move or refinance within ten years, or else are not concerned about a coupon reset ten years in the future.
- Those who take out 5x1 and 7x1 ARMs are more like balloon borrowers, who feel that there is a good chance they will move or refinance before the reset date, but prefer a hybrid to a balloon because of the "negative" connotation sometimes associated with a balloon payment.

Hybrids Versus Balloon Prepayments

Notice that in Figure 5, while the one-month balloon speeds are faster than the 5x1 and 7x1 ARM speeds, the six-month and one-year speeds are similar, indicating that the ARMs were faster in the refinancing wavelet earlier this year. This is confirmed in Figure 6, which shows monthly speeds on 1994 origination 5x1 ARMs and on discount five-year balloons.

Figure 6. Prepayment Speeds on 1994 5x1 ARMs and on Five-Year Balloons



Source: Salomon Brothers Inc.

The ARMs were more responsive than the balloons during the low rates in early 1996, despite similar WACs. This suggests that the 5x1 ARMs retain some traditional ARM character, with some borrowers likely refinancing into another ARM (refinancings into 30-year fixed-rate loans were probably rare, given that the WAC on the 5x1s, around 6.89%, was lower than the low in 30-year mortgage rates). At the same time, the higher recent speeds on the balloons indicates that there is more self-selection towards "fast movers" in the balloons than in hybrid ARMs.

Projecting Speeds on Hybrids

Valuation of hybrid ARMs requires a prepayment assumption, even though the data is limited. Based on the available data, we conclude that

- For 3x1 ARMs, speeds should be assumed to be relatively slow for the first three years, perhaps half or less of those of comparable one-year ARMs. After the first reset, although there is not much data, it is reasonable to expect speeds to experience a short-term spike if the coupon resets upward, similar to what happens with one-year ARMs.
- For 5x1 and 7x1 ARMs, speeds should experience more of a spike than balloon speeds for marginal refinancing incentive, due to the partial ARM "nature" of hybrids. For major drops in rates, while data from the 1992 and 1993 refinancing waves are very spotty, it seems to show hybrid ARM speeds reaching highs of between 30% and 50% CPR. This is higher than standard one-year ARMs, but lower than fixed-rate or balloon premiums. In other words, in keeping with their name, hybrid ARMs should exhibit refinancing behavior that is a mix of ARM and fixed-rate patterns. This also implies that burnout will be more significant for hybrid than for traditional ARMs.
- Base case speeds on the 5x1 and 7x1 ARMs should be slower than on balloons, but faster than on comparable 30-year coupons.
- For 10x1s, we expect speeds to show a mix of 30-year fixed-rate and balloon characteristics, with more weight on the 30-year.

There is some concern as to what happens after the first reset date. For 3x1 ARMs, as discussed previously, speeds should be similar to those on one-year ARMs. Even for other hybrid ARMs, it is not unreasonable to expect speeds to show the same pattern as seasoned one-year ARMs —

that is, some refinancings in response to interest-rate changes, with the responses becoming more dampened with seasoning, due to smaller loan balances and due to burnout.

Relative Value

Based on the discussion previously, we can adjust the Salomon Brothers ARM Prepayment Model (which is for standard one-year ARMs) to obtain projections that reflect hybrid ARM prepayment characteristics. This is done by increasing the refinancing curve and lowering base case speeds. We then obtain the speeds shown in Figure 7.¹⁹

Figure 7. Prepayment Projections (CPR) for 5x1 ARM (Immediate Shifts)

	-300	-200	-100	0	100	200	300
1 Year	53.4	36.1	23.5	11.2	5.6	4.7	4.5
Long Term	33.4	24.3	19.2	14.5	11.2	10.4	10.0

Note: The 5x1 ARM is assumed to be seasoned about a year.
Source: Salomon Brothers Inc.

Using this modified prepayment model, FNMA 5x1 pool 356299, for example, had an OAS of around 85bp, using market-implied volatilities.²⁰ By comparison, five-year balloons currently have OASs of around 35bp, and representative one-year conventional ARMs have OASs in the mid-70s (to market-implied volatilities). Uncertainty about prepayment speeds seems to have led to hybrid ARMs being cheap on a relative-value basis.

¹⁹ Readers with access to the *Yield Book* can use the Prepay Model Dials page to obtain similar projections.

²⁰ The OAS is relatively insensitive to the prepayment adjustments (or *Yield Book* dials) used, varying only a few basis points if the adjustments (or dials) are changed.