

Value in Hybrid ARMs

Over the next few months, slowing prepayments and increasing availability should provide a boost to the hybrid ARM sector. Speeds of 5x1 hybrids declined 23% in the month of October, one of the sharpest in the universe of ARMs. This decrease comes on the heels of similar declines in 7x1s and 10x1s in the month of September and it might be a leading indicator for further slowdowns, especially in the 3x1 sector. Also, over the last three months Fannie Mae has originated about \$750 million and \$600 million of 5x1s and 3x1s, respectively. Although most originators retain conventional loans in their portfolios, with ARM issuance running at almost 45% of total conventional origination, the secondary market should begin to see increased pool issuance.

Comparison of Hybrids to Other Short-Duration Products

The hybrid sector has two main pricing conventions — DM@constant CPR and Par-Put@YTM. Hybrids offer value relative to some other short-duration mortgage products because these pricing conventions are conservative in the current environment. Specifically:

- **The slowdown in speeds has not been completely priced in.** Though speeds have declined considerably, 5x1 hybrids were paying down about 30% slower in the first half of 1997 in a similar interest rate environment.
- **A lack of data has probably caused investors to conservatively value the principal balance remaining at the first reset.** The principal left at the end of first reset and is typically priced at an exit price in the range \$100 to \$101. Even after one of the heaviest refinancing periods, the 3x1 and 5x1 pools that reset recently still have a combined factor of around 0.30 and have traded around \$102.

Below we compare a 5x1 hybrid pool to two groups of short-duration products. Both trades show OAS and total-return advantages for the hybrid pool. We have used a 5x1 TBA for the analyses, since it is relatively more liquid but 3x1, 7x1, 10x1 and seasoned 5x1s look cheap to new 5x1s. Part of the reason might be the lower liquidity premium on 5x1 TBAs. The analyses were done assuming 100% of the Salomon Smith Barney Prepayment Model projections and gradual parallel yield curve shifts. We briefly discuss the reasons for choosing the specific products for comparison and some of the total-return characteristics.

Figure 42 presents a comparison of a new 5x1 hybrid pool to 15-Yr TBAs. This comparison is reasonable because hybrids have similar yield-curve exposures as dwarfs. Also, the pools in this example have similar WALs, durations, and convexities. Relative improvement in convexity cost over the horizon helps the hybrid outperform in the base case. Better convexity and future value of higher coupons (which do not hit caps until +100bp) help maintain the advantage in the up-scenarios. Hybrids have tightened significantly very recently, but they still have better convexity compared to similar-duration dwarfs.

Figure 42. Comparison of a New 5x1 Hybrid to 15-Year TBAs, 18 Nov 99

	Coupo n	Price	Market		Yield to Maturity	WAL	Eff Dur	Eff Cnvx	Cnvx Cost	Projected One-Year Total Returns							
			Value	OAS						-150	-100	-50	0	50	100	150	
BUY:																	
FNMA	6.64	99.313	100.0	73 bp	7.0 %	5.38 Yrs.	3.2	-0.93	41	9.28	9.11	8.39	7.29	5.94	4.43	2.80	
SELL:																	
FNCI	7.50	101.409	79.3	73 bp	7.2 %	5.59 Yrs.	3.0	-1.33	42	8.69	8.95	8.36	7.29	5.90	4.37	2.74	
FNCI	7.00	99.973	20.6	68	7.0	5.89	3.5	-0.93	30	9.81	9.52	8.52	7.15	5.57	3.90	2.17	
Total	7.40	101.109	100.0	72 bp	7.1 %	5.65 Yrs.	3.1	-1.25	40	8.92	9.07	8.39	7.26	5.83	4.27	2.63	
Difference	-0.76	-1.796	0.0	2 bp	-0.1 %	-0.27 Yrs.	0.1	0.31	1	0.36	0.04	0.00	0.03	0.11	0.16	0.17	

Source: Salomon Smith Barney

Figure 43. Comparison of a New 5x1 Hybrid to PACs, 18 Nov 99

	Coupo n	Price	Market		Yield to Maturity	WAL	Eff Dur	Eff Cnvx	Cnvx Cost	Projected One-Year Total Returns							
			Value	OAS						-150	-100	-50	0	50	100	150	
BUY:																	
FNMA	6.64	99.313	100.0	73 bp	7.0 %	5.38 Yrs.	3.2	-0.93	41	9.28	9.11	8.39	7.29	5.94	4.43	2.80	
SELL:																	
PACs ^a	6.62	99.584	100.0	58 bp	6.8 %	4.77 Yrs.	3.1	-1.11	26	9.01	8.96	8.28	7.18	5.80	4.33	2.70	
Difference	0.01	-0.271	0.0	15 bp	0.2 %	0.61 Yrs.	0.2	0.17	15	0.27	0.16	0.10	0.11	0.14	0.10	0.10	

^a Portfolio of three and four year PACs with similar duration and convexity of the hybrid pool.

Source: Salomon Smith Barney.

Figure 44. Hybrid Speeds: Actual Versus Projected by Salomon Smith Barney Prepayment Model as of Oct 99

Origination		Last 1 Month				Last 3 Months				Last 12 Months			
Year	Coupon	PROJ	ACT	ERR	RATIO	PROJ	ACT	ERR	RATIO	PROJ	ACT	ERR	RATIO
92	6.5	26.5	17.6	-8.9	0.7	25.0	18.2	-6.9	0.7	27.7	25.1	-2.6	0.9
92	7.5	18.2	33.3	15.1	1.8	19.4	37.4	18.0	1.9	28.3	35.7	7.4	1.3
94	6.5	23.7	21.7	-2.0	0.9	22.8	26.1	3.3	1.1	33.6	33.7	0.1	1.0
94	7.0	20.7	16.7	-4.0	0.8	21.5	26.8	5.3	1.3	33.0	40.1	7.1	1.2
95	7.5	20.9	8.3	-12.6	0.4	22.0	14.6	-7.5	0.7	34.2	35.7	1.5	1.0
95	7.0	20.1	24.3	4.2	1.2	21.3	23.0	1.7	1.1	34.5	34.1	-0.3	1.0
96	6.5	17.6	12.6	-5.0	0.7	18.6	17.1	-1.5	0.9	32.1	26.6	-5.5	0.8
96	6.0	16.8	45.0	28.2	2.7	17.8	18.4	0.7	1.0	25.7	25.7	0.0	1.0
96	7.0	18.0	24.8	6.8	1.4	19.3	27.0	7.6	1.4	35.4	38.4	3.0	1.1
97	6.5	13.2	13.1	-0.1	1.0	14.0	18.6	4.6	1.3	23.8	25.6	1.8	1.1
97	7.0	17.0	19.4	2.4	1.1	18.1	21.0	2.9	1.2	34.2	34.9	0.7	1.0
98	6.0	15.3	15.0	-0.3	1.0	15.8	19.1	3.3	1.2	16.0	16.9	0.9	1.1
98	6.5	16.5	11.6	-4.9	0.7	17.0	15.0	-2.0	0.9	19.1	17.2	-1.9	0.9

Source: Salomon Smith Barney

Figure 43 presents a comparison of a new 5x1 hybrid pool to PACs. This comparison is reasonable because the PAC portfolio on average receives most of the cashflow around the fifth year in an unchanged scenario. The hybrid cash-flows are also likely to peak around the fifth year coincident with its first reset. The hybrid outperforms in the up-scenarios despite its extension for reasons similar to the previous trade (future value of higher coupons). In the down-scenarios, the PAC shortens beyond -100bp.

Hence overall, the hybrid pool shows comfortable outperformance against PACs and competitive performance against 15-year TBAs.

Comments on Modeling and Validation of Results

It is natural to question the validity of OAS and model based projected results, since historical data on hybrids are sparse. Hence, we present an analysis of the performance of the Salomon model over the past 12 months in Figure 44. On average the model has captured speeds across coupons and seasoning reasonably well. We also find that OAS on the hybrid pool breaks even with the PACs only at 160% of our refinancing projections.

We also present a yield table for various stress test scenarios in Figure 45. A typical four-year PAC of similar duration and convexity to those of the hybrid pool has a yield-to-maturity around 6.80%. We run the hybrid under various speed assumptions and show that it has a yield advantage even under very conservative estimates. The hybrid is priced at \$99-10. The implied exit price (price at first reset) in Figure 45 is calculated for a five-year-old hybrid at the current fully indexed net coupon of 7.71% at constant speed and YTM assumptions. We also examine YTM's at several other exit price assumptions (\$100-\$103).

Therefore, we see the implied prices are higher than par even under conservative speed estimates. Constant OAS methodologies also indicate exit prices in the range of \$102-\$103. Limited data show that as recently as a month ago fully indexed hybrids traded around \$102. But even with an exit price of \$100, which assumes complete paydown at reset (an unlikely phenomenon), the hybrids still have a yield advantage.

Figure 45. Yield Table for a New 5x1 Hybrid for Different Exit Price Assumptions, 18 Nov 99

	CPR (%)			
	15	20	25	50
YTM @ 99-10	7.11 %	7.05 %	6.96 %	6.94 %
Implied Exit Price at first reset	\$102.41	\$102.07	\$101.76	\$100.66
YTM @ other exit price assumptions				
103	7.18 %	7.12 %	7.08 %	6.98 %
102	7.07	7.04	7.01	6.96
101	6.97	6.95	6.94	6.94
100	6.86	6.87	6.88	6.93

Source: Salomon Smith Barney.

Conclusion. Hybrid ARMs look cheap to other short-duration products like PACs and 15-year TBAs. Uncertainty in prepay behavior along with market pricing conventions probably account for the cheapness of this product.