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Long CMOs trade at wider OASs than their short-duration counterparts.

Exploiting Inefficiencies in the Agency CMO Market

In our recent mortgage strategy conference call (January 9th), one of the topics we discussed was taking advantage of inefficiencies in the valuations of agency CMOs relative to those of agency pass-throughs. As shown in Figure 1, long-duration CMOs trade at wider OASs than those of their short-duration counterparts; in addition, premium CMOs (represented by "P" in Figure 1) trade at significantly wider OASs than issues with comparable durations and convexities, but lower prices (represented by "C"). These inefficiencies are generally not evident in the pass-through market, since on average the OAS curve is flat across coupons.

Figure 1. Agency CMO OASs Versus Effective Duration, Selected PAC and Sequential Issues, Dec 96
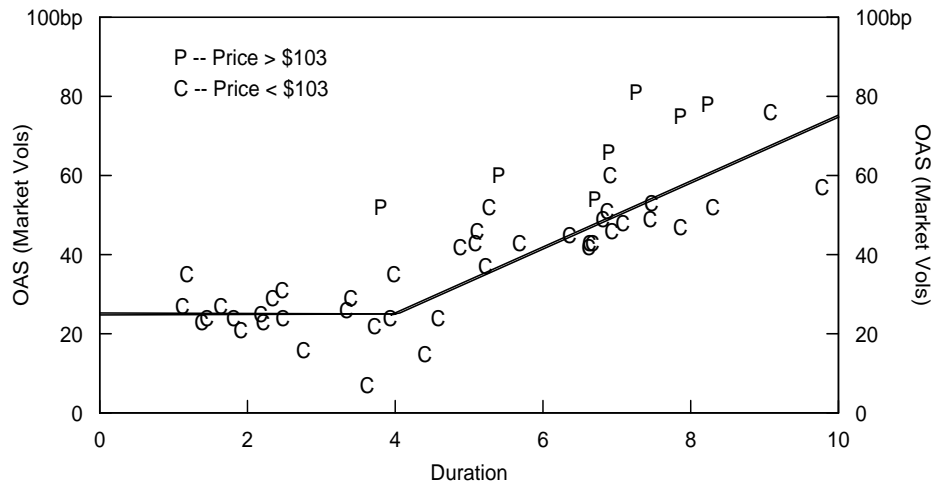
Source: Salomon Brothers Inc.

In our conference call, we recommended exploiting these inefficiencies by substituting last-cash flow CMOs for discount 30-year GNMAs. The purpose of this article is to look at three ways this strategy can be implemented, identifying the major risks, and projecting the return advantages of each strategy.

Impediment to exploiting the wide OASs of long CMOs.

One impediment to exploiting the wider OASs available in long CMOs is that they must be barbelled with shorter-duration securities in order to match the durations of even the longest pass-throughs. As can be seen in Figure 1, short CMOs generally trade at narrow OASs (in the vicinity of 25bp). Consequently, in most cases, barbelling long and short CMOs to match pass-through durations requires the sacrifice of much of the OAS advantages of the long CMOs. What securities offer short durations and wide OASs, which would allow the retention of the OAS advantage of a long CMO? Two that we like are seasoned premium pass-throughs and GNMA ARMs.

Below we show three barbells versus 30-year GNMA 6.5s: (1) seasoned premium pass-throughs (in CMO format) + last-cash flow premium CMOs; (2) GNMA ARMs + last-cash flow premium CMOs; and (3) GNMA ARMs + long discount Zs. The OAS and projected one-year return advantages of these barbells over the pass-throughs are all roughly comparable (ranging between 20bp and 30bp). However, the risks in the strategies (especially exposure to prepayments and yield curve reshaping) differ significantly.

In Figure 2, we compare the yield, OAS, and projected one-year total returns of a barbell of FNMA 90-98 J and FHLMC 1763 K to those of GNMA 6.5s. FNMA 90-98 J is a 9% coupon bond backed by 1990 origination FNMA 9.5s. After the tranche in front of it matures (which we project to occur in about two years at current interest-rate levels), the principal cash flows of FNMA 90-98 J will mimic those of the underlying collateral. FHLMC 1763 K is an 8.5% coupon last-cash flow tranche backed by 1994 origination FNMA 8.5s representing the final 7.5% of the principal balance of the underlying collateral at issuance. The CMO barbell offers yield and OAS advantages of 26bp and 28bp, respectively, and projected return advantages ranging between 20bp and 35bp for interest-rate moves of as much as 150bp over one year.

Figure 2. Yield, OAS, and Projected Return Advantages of a Premium CMO Barbell Versus GNMA 6.5s, 23 Jan 97

Issue	Market Value Weight	Price	Yield	OAS	Projected One-Year Total Returns						
					-150bp	-100bp	50bp	0bp	50bp	100bp	150bp
FNMA 90-98 J	36.5%	$107.94	7.43%	54bp	10.91%	10.19%	9.31%	7.82%	6.03%	4.05%	1.90%
FHLMC 1763 K	63.5	107.41	7.84	77	17.82	14.80	11.41	7.84	4.33	0.69	-2.94
Combination	100.0%	$107.60	7.69%	69bp	15.30%	13.12%	10.65%	7.83%	4.95%	1.92%	-1.17%
GNMA 6.5s	100.0%	$94.72	7.43%	41bp	14.96%	12.92%	10.42%	7.62%	4.67%	1.65%	-1.37%
Advantage			26bp	28bp	0.35%	0.20%	0.23%	0.21%	0.28%	0.26%	0.20%

Source: Salomon Brothers Inc.

Premium CMO barbells offer high yields and wide OASs but are exposed to refi burnout risk.

In Figure 3, we examine the risk profile of the barbell relative to that of the pass-through. The yield curve exposure of the barbell is nearly identical to that of the GNMAs, as the partial durations vary by no more than 0.1 years for each of the key Treasury rates. (Partial durations represent how a security's effective duration is distributed along the yield curve.) Exposure to changes in interest-rate volatility are also comparable, as the volatility durations of the CMO barbell and GNMAs are nearly identical. (We define volatility duration as the percentage change in the price of a security for a 1% change in volatility; if volatility duration is positive, the price of a security goes down when volatility goes up.) However, exposure to prepayments is dramatically different, as measured by the prepayment duration. (We define prepayment duration as the percentage change in the price of a security for a 1% change in prepayment model projections; if prepayment duration is positive, the price of a security goes down when prepayment model projections are increased.) For example, the prepayment duration of the CMO barbell (0.065) suggests that a 10% increase in prepayment projections would reduce the value of the barbell by 0.65% (at a constant OAS). In contrast, the GNMA 6.5s have a negative prepayment duration, suggesting that faster prepayments increase the value of the pass-throughs (owing to discount pricing).

Figure 3. Risk Profile: Premium CMO Barbell Versus GNMA 6.5s, 23 Jan 97

Issue	Market Value Weight	Eff. Dur.	Partial Durations						Eff. Cnvx.	Vol. Dur.	Prepay Dur.
			1 yr.	2 yr.	3 yr.	5 yr.	10 yr.	30 yr.			
FNMA 90-98J	36.5%	3.9	0.1	0.2	0.6	1.6	1.4	0.1	-1.1	0.25	0.052
FHLMC 1763 K	63.5	7.5	0.0	0.0	0.1	0.5	4.9	1.9	-0.5	0.29	0.073
Combination		6.2	0.0	0.1	0.3	0.9	3.6	1.3	-0.7	0.28	0.065
GNMA 6.5s		6.3	0.0	0.1	0.3	1.0	3.7	1.2	-0.5	0.26	-0.014
Difference		-0.1	0.0	0.0	0.0	-0.1	-0.1	0.1	-0.2	0.02	0.079

Source: Salomon Brothers Inc.

This analysis suggests that the major risk of substituting a premium CMO barbell for discount pass-throughs is prepayments. The premium CMOs will suffer if refinancing burnout occurs more slowly than our model suggests; the CMOs will also suffer (and the discount pass-throughs will be helped) if prepayments related to housing turnover are faster than we are projecting.

How wrong do we have to be on prepayments for the CMOs to represent only fair value versus the pass-throughs? We need to increase our projections by over 25% for the OAS of the CMO portfolio to decline to that of the GNMA 6.5s. Are our prepayment projections realistic? We think so, but one way to check on the market's prepayment expectations is to look at what prepayment projections are implied by IO and PO prices. As we discussed in last week's issue of *Bond Market Roundup: Strategy*, implied prepayment models based on equating the OASs of IOs and POs from the same IO/PO Trusts suggest that the market's projections are currently quite close to our own. For example, implied prepayment projections for 1994 origination 8.5s (based on FNMA Trust 274 IOs and POs) are currently 1.5% slower than our own, while implied prepayment projections for seasoned FNMA 9.5s (based on FNMA Trust 4 IOs and POs) are approximately 12.5% faster.

For what type of investor could a strategy of substituting premium CMOs for discount pass-throughs make sense? The strategy may be a difficult one for money managers benchmarked against a mortgage index for several reasons: the yield advantage of the CMOs will likely take on the order of a year to make up for their wider bid/ask spreads; the strategy will introduce month-to-month tracking error versus the pass-throughs that could be significant; and the real world convexity of premium CMOs over short horizons is unlikely to be as good as our models suggest. Consequently, we believe that this strategy makes the most sense for investors who can afford to be patient because (if our prepayment projections are accurate), over longer time periods, the yield advantage of the CMOs should prevail. In addition, we believe the strategy should be attractive to investors who are using discount pass-throughs to fund nonmortgage liabilities, as it allows for the diversification of prepayment risk (refinancing burnout versus housing turnover) while increasing expected returns.

Refi burnout risk can be mitigated by substituting GNMA ARMs for the short end of the premium CMO barbell.

Can anything be done to reduce exposure to refinancing burnout risk without sacrificing value? In Figure 4, we compare the yield, OAS, and projected one-year returns of the above barbell, except that GNMA 6% ARMs have been substituted for FNMA 90-98 J, to those of GNMA 6.5s. The ARM/CMO barbell offers yield and OAS advantages of 14bp and 30bp, respectively, and projected return advantages ranging between 19bp and 43bp for interest-rate moves of as much as 150bp over one year.

Figure 4. Yield, OAS, and Projected Return Advantages of a GNMA ARM/Premium CMO Barbell Versus GNMA 6.5s, 23 Jan 97

Issue	Market Value Weight	Price	Yield	OAS	Projected One-Year Total Returns						
					-150bp	-100bp	-50bp	0bp	50bp	100bp	150bp
GNMA 6% ARM	27.3%	$100.19	6.83%	55bp	8.90%	8.79%	8.51%	7.73%	6.53%	5.09%	3.49%
FHLMC 1763 K	72.7	107.41	7.84	77	17.82	14.80	11.41	7.84	4.33	0.69	-2.94
Combination	100.0%	$105.33	7.57%	71bp	15.39%	13.16%	10.62%	7.81%	4.93%	1.89%	-1.18%
GNMA 6.5s	100.0%	$94.72	7.43%	41bp	14.96%	12.92%	10.42%	7.62%	4.67%	1.65%	-1.37%
Advantage			14bp	30bp	0.43%	0.24%	0.20%	0.19%	0.26%	0.24%	0.19%

Source: Salomon Brothers Inc.

In Figure 5, we examine the risk profile of the ARM/long premium CMO barbell versus the pass-throughs. The exposure to refinancing burnout risk has been modestly reduced, but at the expense of adding exposure to a steepening of the yield curve (the ARM/CMO barbell is short-duration in the three- to five-year part of the curve and long-duration in the 10- to 30-year part of the curve relative to GNMA 6.5s).

Figure 5. Risk Profile: GNMA ARM/Premium CMO Barbell Versus GNMA 6.5s, 23 Jan 97

Issue	Market Value Weight	Eff. Dur.	Partial Durations						Eff. Cnvx.	Vol. Dur.	Prepay Dur.
			1 yr.	2 yr.	3 yr.	5 yr.	10 yr.	30 yr.			
GNMA 6% ARM	27.3%	3.1	0.3	0.8	0.2	0.3	1.1	0.3	-0.8	0.30	0.012
FHLMC 1763 K	72.7	7.5	0.0	0.0	0.1	0.5	4.9	1.9	-0.5	0.29	0.073
Combination		6.3	0.1	0.2	0.1	0.5	3.9	1.5	-0.6	0.29	0.056
GNMA 6.5s		6.3	0.0	0.1	0.3	1.0	3.7	1.2	-0.5	0.26	-0.014
Difference		0.0	0.0	0.1	-0.2	-0.5	0.2	0.3	-0.1	0.04	0.070

Source: Salomon Brothers Inc.

Refi burnout risk can be virtually eliminated by substituting long, discount Zs for the long end of the barbell.

If a further reduction in exposure to refinancing burnout is desired, long discount Zs can be substituted for FHLMC 1763 K, at the expense of about a 10bp reduction in OAS and with a further increase in exposure to a steepening yield curve. In Figure 6, we compare the yield, OAS, and projected one-year returns of a barbell of GNMA 6% ARMs and FHLMC 1927 ZA, a long discount Z with a 6% coupon backed by 1995 origination Gold 6.5s, to those of GNMA 6.5s. The ARM/discount Z barbell offers an OAS advantage of 20bp and projected return advantages ranging between 8bp and 29bp for interest-rate moves of as much as 150bp over one year.

Figure 6. Yield, OAS, and Projected Return Advantages of GNMA ARM/Discount Z Barbell Versus GNMA 6.5s 23 Jan 97

Issue	Market Value Weight	Price	Yield	OAS	Projected One-Year Total Returns						
					-150bp	-100bp	-50bp	0bp	50bp	100bp	150bp
GNMA 6% ARM	75.5%	$100.19	6.83%	55bp	8.90%	8.79%	8.51%	7.73%	6.53%	5.09%	3.49%
FHLMC 1927 ZA	24.5	79.31	7.92	76	34.31	25.94	17.33	8.47	-0.17	-8.34	-16.01
Combination	100.0%	$94.12	7.10%	61bp	15.13%	13.00%	10.68%	7.91%	4.89%	1.79%	-1.30%
GNMA 6.5s	100.0%	$94.72	7.43%	41bp	14.96%	12.92%	10.42%	7.62%	4.67%	1.65%	-1.37%
Advantage			-33bp	20bp	0.18%	0.08%	0.26%	0.29%	0.22%	0.14%	0.08%

Source: Salomon Brothers Inc.

Figure 7. Risk Profile: GNMA ARM/Discount Z Barbell Versus GNMA 6.5s, 23 Jan 97

Issue	Market Value Weight	Eff. Dur.	Partial Durations						Eff. Cnvx.	Vol. Dur.	Prepay Dur.
			1 yr.	2 yr.	3 yr.	5 yr.	10 yr.	30 yr.			
GNMA 6% ARM	75.5%	3.1	0.3	0.8	0.2	0.3	1.1	0.3	-0.8	0.30	0.012
FHLMC 1927 ZA	24.5	17.1	-0.2	-0.3	-0.6	-1.7	11.0	8.9	1.1	0.31	-0.077
Combination		6.5	0.2	0.5	0.0	-0.2	3.5	2.4	-0.4	0.30	-0.010
GNMA 6.5s		6.3	0.0	0.1	0.3	1.0	3.7	1.2	-0.5	0.26	-0.014
Difference		0.2	0.1	0.4	-0.2	-1.1	-0.2	1.3	0.2	0.05	0.004

Source: Salomon Brothers Inc.