Structural Implications— Of Subprime Loan Mods

"Prudent Loan Modifications" are emerging as the most hopeful component of loss mitigation policy. Both the President of the U.S. and the Federal Reserve Chairman have pointed to loan modifications as a way to stem the rising tide of delinquencies and foreclosures. An arcane topic for most investors prior to 2007, loan modifications permit the servicer to alter the terms of the loan in order to prevent the borrower from defaulting. Specific types of loan modifications discussed have ranged from coupon reduction, delay of rate reset, or extension of term. Perhaps the most direct and concrete recommendation was made by FDIC chairman Sheila Bair, reported in the *Wall Street Journal* October 5, 2007. "*Keep [the loan] at the starter rate. Convert it into a fixed rate. Make it permanent. And get on with it.*"

While the suggestion struck the *Wall Street Journal* as "*the most sensible proposal we've heard*," the complex ownership structure of securitized loans makes any such wholesale action far from assured. There are legal questions as to whether wholesale modifications are permissible under the Trust's Pooling and Servicing agreements. Some argue that each loan modification can only be made on a case-by-case basis, with the trust's interest or bondholder's interest as the primary criterion.

Less visible than the public policy rhetoric are implications to the subprime bond investor, assuming that the industry is able to enact wide-spread loan modifications. Specifically, how would modifications affect bond holders, CDOs and the ABX? Would mods ultimately help or harm bond investors? Would the effect vary across the capital structure and vintage?

In this article, we're going to look at the back end of the loan mods question, namely, structural implication of wholesale loan mods to a deal's collateral. Given certain assumptions about how, and how many, loans are modified - - how are bonds in various parts of a deal's capital structure affected?

Analysis

Our approach uses the ABX as our testing ground for examining the effect of loan mods. We think the ABX series is reasonably representative of the subprime population, and the ABX has been the subject of much analysis and several articles in the *Mortgage Strategist*. The earliest index, 06-1, is currently well into rate resets, while loans in the newer indices are still in their teaser periods. We regularly generate projected losses for the bonds referenced by the ABX, and by comparing losses versus breakevens, we can value the ABX and compare our valuations versus market prices.

Our ABX analysis method examines both sides of the deal structure separately. We analyze the collateral to determine losses, then use the structure to project

writedowns given losses. Much of our recent efforts have been on the *collateral* side (*e.g.*, research to project losses from delinquencies, and creation of the shutdown model to estimate losses under a shutdown scenario). *Bond-structure* research which examines the role of triggers and stepdowns has been recently overshadowed by collateral research.

The nature of loan mods would rightfully cover both collateral and bond sides of the structure. In this article, we'll make only the broadest assumptions regarding selection of loans to be modified and collateral performance post-modification. We'll concentrate our efforts on studying the effect on the structure once individual bonds have been modified, and the outcome for individual bonds.

Much speculation has been directed toward identifying the most likely candidates for modification and predicting the loan performance post-modification. Should only loans that are current be modified? Would delinquent loans become good performers after the modification? What are the moral hazards of loan modifications? For the purpose of today's article, we are going to abstract away these questions by answering them with the most elementary assumptions. Our focus is in seeing how the structure performs.

Assumptions

Our analysis will simulate the "Bair Mod"—convert hybrid ARMs currently in teaser into 30-year Fixed Rate Loans, with the coupon frozen at the teaser rate. We will project flat interest rates.

We'll vary the percent of loans modified (the percent measured by remaining balance of hybrid arms still in the teaser period). When we modify less than 100% of the loans, we'll always modify loans with the smallest remaining balance. This is more a concession to expedience than any theory concerning loan balances, but we wanted a consistent way of selecting loans to modify.

In addition, we'll vary the default and prepay assumptions from unchanged to reduced prepays and defaults. It's natural to assume that modifying the loans will have some effect on defaults—this is after all why the mods are proposed in the first place. We also believe mods will slow speeds, so we'll run those scenarios as well.

As a base, we use 75% of the PPC (prospectus prepayment curve) for each deal, reflecting the overall slowdown in speeds. PPC curves are typically specific for ARMs and fixed rate loans. A typical ARM PPC might ramp up to 50 CPR at 24 months to reflect resets, then settle down to 35 CPR; an example Fixed Rate PPC might have a 10 month ramp to 23 CPR. In terms of default, for ARMs, we use a 40 month ramp to 20 CDR, and for Fixed, a 40 month ramp to 12 CDR. When calculating breakevens, multiples of the default curves are used to generate writedowns. In our analysis we always use the same multiple for both

ARM and Fixed curves; thus while absolute levels of defaults will be different in each analysis, Fixed Rate defaults will always be 60% of ARMs.

As we have done in earlier articles, we evaluate bonds by calculating the bond's breakeven loss; *i.e.*, the deal cum loss at which the bond begins to take writedowns. We do this by increasing the default curve multiplier until the bond takes a small ($1000) writedown, and referring to the corresponding collateral as the bond's breakeven point. We like the breakeven method because the results are intuitive and can be compared against projected bonds losses. What we *don't* like about this method is that it fails to take timing into account. It assumes triggers fail, and uses multiples of a generic default curve (with its implied timing) to calculate breakevens. It cannot address some of the potential consequences of loan modifications, such as resetting trigger thresholds, or potential redistribution of losses across the capital structure in the event losses are forestalled but not abated. It's also not entirely consistent, since wholly different assumptions are used to project losses and to generate breakevens.

That said, we argue that without surrendering oneself to loan-level models to project prepayments, defaults, and delinquencies, it would be impossible to examine these finer points. Comparing breakevens is the most consistent approach given our generic prepay and default assumptions.

Effect of Loan Mods on ABX Breakevens

In this analysis, modding (modifying) a loan turns it from a floating rate loan into a fixed rate loan at the teaser rate. From the borrower's perspective, the rate reset is simply eliminated. We run a number of Mod scenarios for each index, summarized in Table 1 (below).

Table 1. Summary—Loan Mod Scenarios

	Scen 1	Scen 2	Scen 3	Scen 4
Loan Cashflows	No Mods	Mod ARMs become Fixed	Mod ARMs become Fixed	Mod ARMs become Fixed
FRM Prepay & Default Curves	100% FRM	100% FRM	100% FRM	100% FRM
Non MOD ARM Prepay & Default Curves	100% ARM	100% ARM	100% ARM	100% ARM
MOD ARM Prepay Curve	N/A	100% ARM	100% FRM	50% FRM
MOD ARM Default Curve	N/A	100% ARM Default	100% FRM Default	100% FRM Default

Source:UBS

"Scen 1" is the base case, or plain vanilla breakevens we've always run with no loan mods and at 75 PPC (our "base" speed). "Scen 2" changes modified loan ARM cashflows to Fixed cashflows at the teaser rate and does away with the rate reset, but uses ARM base prepay and default assumptions. "Scen 3" runs modified loans as Fixed cashflows as in Scen 2 but uses Fixed-rate base prepay

and default assumptions. "Scen 4" is as Scen 3, except prepayments are slowed 50% of base. In all cases, fixed rate bonds continue to run with base fixed prepay and default assumptions, and unmodified and already-reset ARMs continue to run with base ARM prepay and default assumptions.

Table 2 (below) shows average breakevens for the ABX indices assuming 50% of loans are modified (50% mods, meaning that mods were performed on 50% of unreset hybrid arms, by remaining balance). Table 3 shows the breakevens assuming 100% of loans are modified. In Tables 1-3, "Scen 1" shows base breakevens calculated using normal deal assumptions and no modifications.

Table 2. Break Evens (assuming 50% Mods)

		MOD 50% UNRESET ARMS		
INDEX	Scen 1 BASE Breakeven	Scen 2 Unch PPY and Def	Scen 3 ARM as Fix PPY 100%	Scen 4 ARM as Fix PPY 50%
ABX-06-1 Aaa	21.91%	21.82%	21.57%	21.97%
ABX-06-1 Aa	17.19%	17.02%	16.95%	17.15%
ABX-06-1 A	12.86%	12.54%	12.47%	12.68%
ABX-06-1 Baa2	9.67%	9.25%	9.20%	9.41%
ABX-06-1 Baa3	8.89%	8.44%	8.40%	8.63%
ABX-06-2 Aaa	23.83%	23.60%	23.46%	23.77%
ABX-06-2 Aa	18.44%	17.98%	17.86%	18.54%
ABX-06-2 A	14.33%	13.59%	13.46%	14.25%
ABX-06-2 Baa2	11.07%	10.09%	9.98%	10.77%
ABX-06-2 Baa3	10.28%	9.25%	9.15%	9.97%
ABX-07-1 Aaa	24.67%	24.48%	24.40%	25.23%
ABX-07-1 Aa	18.82%	18.34%	18.24%	19.32%
ABX-07-1 A	14.76%	14.00%	13.90%	15.09%
ABX-07-1 Baa2	11.61%	10.58%	10.49%	11.61%
ABX-07-1 Baa3	10.64%	9.54%	9.46%	10.61%
ABX-07-2 Aaa	27.42%	27.30%	27.26%	28.12%
ABX-07-2 Aa	20.82%	20.40%	20.28%	21.37%
ABX-07-2 A	16.21%	15.50%	15.38%	16.55%
ABX-07-2 Baa2	12.73%	11.77%	11.68%	12.87%
ABX-07-2 Baa3	11.77%	10.74%	10.65%	11.90%

Source: INTEX, UBS

Table 3. Breakevens (assuming 100% Mods)

INDEX	Scen 1 BASE Breakeven	MOD 100% UNRESET ARMS Scen 2 Unch PPY and Def	Scen 3 ARM as Fix PPY 100%	Scen 4 ARM as Fix PPY 50%
ABX-06-1 Aaa	21.91%	21.77%	21.43%	21.88%
ABX-06-1 Aa	17.19%	16.88%	16.81%	17.08%
ABX-06-1 A	12.86%	12.30%	12.22%	12.52%
ABX-06-1 Baa2	9.67%	8.94%	8.88%	9.22%
ABX-06-1 Baa3	8.89%	8.12%	8.07%	8.44%
ABX-06-2 Aaa	23.83%	23.41%	22.86%	23.83%
ABX-06-2 Aa	18.44%	17.45%	17.36%	18.49%
ABX-06-2 A	14.33%	12.76%	12.67%	14.01%
ABX-06-2 Baa2	11.07%	9.03%	8.97%	10.38%
ABX-06-2 Baa3	10.28%	8.15%	8.11%	9.56%
ABX-07-1 Aaa	24.67%	24.27%	24.17%	25.72%
ABX-07-1 Aa	18.82%	17.82%	17.80%	19.77%
ABX-07-1 A	14.76%	13.19%	13.18%	15.39%
ABX-07-1 Baa2	11.61%	9.50%	9.51%	11.77%
ABX-07-1 Baa3	10.64%	8.43%	8.45%	10.78%
ABX-07-2 Aaa	27.42%	27.13%	27.07%	28.57%
ABX-07-2 Aa	20.82%	19.86%	19.81%	21.78%
ABX-07-2 A	16.21%	14.62%	14.58%	16.74%
ABX-07-2 Baa2	12.73%	10.63%	10.64%	12.92%
ABX-07-2 Baa3	11.77%	9.53%	9.53%	12.00%

Source: INTEX, UBS

"Scen 2" through "Scen 4" in Table 2 and Table 3 show the breakevens under a 50% (and 100%) loan modification scenario. Scen 2 lists breakevens given unchanged prepayment and default curves (we show this to isolate the cashflow effect of the loan mod). In this column, the cashflow effect of the mod eliminates the coupon step-up.

What we see is a reduction of effective subordination across the board. This is the feared effect of loan mods; that the shaved coupons which supply the deal's excess spread credit enhancement will be eroded. Table 4 (at right) shows the aggregate average amount of coupon (in basis points) forgone for loans converted to fixed rate from hybrids with coupons set to the teaser rate.

Table 4. Mod Coupon Reduction

Index	Coupon Shaved
ABX-HE-06-1	394
ABX-HE-06-2	345
ABX-HE-07-1	298
ABX-HE-07-2	296

Source: INTEX, UBS

The breakeven reduction is greater, both relative and absolute, at the bottom of the capital structure. It's greater relatively because excess spread is a large part of a mezz bond's effective subordination. The effect is greater in absolute terms because the very high default multiples needed to write down a senior bond reduce average life of the remaining collateral balance, which reduces excess spread. We also see that modifications in aggregate have a smaller effect on 06-1, because most of the loans have already reset (Table 5, next page at right).

A more realistic set of scenarios is in Scen3 and Scen 4 of Tables 2- 3, labeled "ARM as Fix". Those scenarios make the observation that post-modification, these loans are fixed rate loans, hence we use fixed rate prepayment and default curves for the modded loans. That effectively reduces prepayments and defaults of modded loans to ~60% of their ARM assumptions. These breakevens are Column "Scen 3" in Tables 2 and 3. We now have two contradicting forces; one is the shaved coupon which reduces the collateral-weighted average coupon, and thus excess spread per period. The other is slower speeds increasing excess spread by lengthening the time the collateral balance is outstanding.

We can assume that voluntary prepayments should be slowed even more for modded loans. Presumably, borrowers of these loans would not normally have qualified for a fixed rate loan at the teaser rate, even had the market not shut down. From the borrower's perspective, the mod is a windfall. Therefore we include the last column "Scen 4" which slows prepays down 50% from the base case, or 37.5 PPC, which for a 23 HEP FRM is just under 9 CPR.

How do the mods affect the effective support of the indices? Assuming the "Scen 3" scenario for the BBB indices in the ABX series 06-2, 07-1 and 07-2, every % of loan modification of hybrid ARMs results in ~2bps reduction in effective subordination. It reduces the subordination of the BBBs in 06-1 by about half that (due to the lesser number of moddable loans). When speeds are slowed by half in "Scen 4", that loss of support is recovered by the excess spread generated by the longer duration collateral balances in the BBB 07-1 and 07-2. The recovery of support is less evident in 06-2 and 06-1. These earlier vintages had their coupons clipped more than did the '07 vintages (see Table 4), so slow speeds cannot fully make up for the lost spread. Table 6 (at right) summarizes the change in Effective Support assuming a 100% Loan Mod.

Effect of Mods on ABX Valuation

The reduction in effective support in the worst case Table 3 "Scen 3" case (100% loan mods, ARM as Fixed, 100% FRM Prepay) makes a difference in valuing the ABX. Table 7 (next page) shows the Shutdown model with Base Breakevens, versus the Shutdown Model with the 100% mods at 100% prepay identified above. In each series, some of the indexes show large price drops with mods (although even these prices are higher than current market levels).

However, we think the "Scen 4" cases (mods experience slower prepayments) is actually the more likely scenario, and here, the change in subordination is generally neutral, or beneficial to the structure. These results are shown in Table 7 as "100% Mods Shutdown 50% Prepay." These results are far more neutral compared to the base shutdown case.

Furthermore, the shutdown model is somewhat in contradiction with loan mods; shutdown implies the borrower has no escape hatch, whereas loan mods provides exactly this escape. In other words, if we assume mods, we should use

Table 5. Rem Balance Past Reset

Index	WALA	%ARMs Past Reset
ABX-HE-06-1	26	66%
ABX-HE-06-2	21	6%
ABX-HE-07-1	15	0%
ABX-HE-07-2	9	0%

Source: INTEX, UBS

Table 6. 100% Loan Mod Change in Effective Support

	ARM as Fix PPY 100%	ARM as Fix PPY 50%
ABX-06-1 Aaa	-48	-3
ABX-06-1 Aa	-39	-11
ABX-06-1 A	-64	-33
ABX-06-1 Baa2	-79	-45
ABX-06-1 Baa3	-82	-45
ABX-06-2 Aaa	-97	0
ABX-06-2 Aa	-108	5
ABX-06-2 A	-166	-32
ABX-06-2 Baa2	-210	-70
ABX-06-2 Baa3	-217	-72
ABX-07-1 Aaa	-50	105
ABX-07-1 Aa	-102	94
ABX-07-1 A	-159	63
ABX-07-1 Baa2	-210	16
ABX-07-1 Baa3	-219	14
ABX-07-2 Aaa	-35	115
ABX-07-2 Aa	-101	96
ABX-07-2 A	-163	53
ABX-07-2 Baa2	-209	19
ABX-07-2 Baa3	-223	23

Source: Intex, UBS.

a more benign loss model. And if we use a punishing loss model, we should assume mods were not possible.

Table 7. Loan Mod Scenario—Shutdown Losses & Worst-Case

	NO MODS SHUTDOWN			100% MODS SHUTDOWN 100% Prepay				100% MODS SHUTDOWN 50% Prepay			
Index	TWD	#WD	Implied ABX Price	TWD	#WD	Implied ABX Price	Price Diff	TWD	#WD	Implied ABX Price	Price Diff
ABX-HE-AAA 07-2	55.0	1	99.13	58.0	2	95.40	-3.73	57.0	1	99.26	0.13
ABX-HE-AA 07-2	51.5	8	75.11	50.4	9	70.78	-4.33	53.0	7	79.52	4.40
ABX-HE-A 07-2	45.3	12	62.99	44.2	15	49.98	-13.01	45.3	11	67.10	4.11
ABX-HE-BBB 07-2	43.6	19	37.35	37.6	19	33.24	-4.11	43.5	18	41.44	4.08
ABX-HE-BBB- 07-2	40.6	19	35.31	34.6	19	31.15	-4.16	41.6	19	36.00	0.68
ABX-HE-AAA 07-1	52.7	3	88.30	52.5	4	84.28	-4.03	56.7	3	88.53	0.22
ABX-HE-AA 07-1	45.9	10	59.21	45.5	13	46.71	-12.50	47.1	9	63.54	4.33
ABX-HE-A 07-1	39.4	16	34.04	35.4	16	32.71	-1.32	41.4	16	34.69	0.65
ABX-HE-BBB 07-1	34.4	18	27.99	30.2	19	21.50	-6.48	33.5	17	31.86	3.88
ABX-HE-BBB- 07-1	31.4	18	30.57	27.2	19	23.49	-7.08	32.4	18	31.18	0.61
ABX-HE-AAA 06-2		0	100.40		0	100.40	0.00		0	100.40	0.00
ABX-HE-AA 06-2	46.5	2	92.36	40.5	2	92.08	-0.28	45.5	2	92.31	-0.05
ABX-HE-A 06-2	39.0	4	84.31	40.7	9	63.37	-20.94	38.0	4	84.21	-0.10
ABX-HE-BBB 06-2	38.1	15	39.87	31.6	18	24.36	-15.51	36.7	17	30.80	-9.08
ABX-HE-BBB- 06-2	35.7	17	33.41	27.6	18	25.01	-8.39	32.7	17	31.96	-1.44
ABX-HE-AAA 06-1		0	100.65		0	100.65	0.00		0	100.65	0.00
ABX-HE-AA 06-1		0	101.16		0	101.16	0.00		0	101.16	0.00
ABX-HE-A 06-1		0	101.95	48.0	1	97.86	-4.10		0	101.95	0.00
ABX-HE-BBB 06-1	40.8	4	87.92	36.6	7	74.28	-13.64	36.0	5	82.76	-5.16
ABX-HE-BBB- 06-1	41.2	10	66.28	34.2	10	63.71	-2.57	37.2	10	64.82	-1.46

Source: INTEX, UBS

The Known Unknowns

Where does that leave us? Even wholesale loan mods will in no way rewrite subprime structure rules, even when we layer worst-of-both-world scenarios atop each other. We see that certain reasonable prepayment and default scenarios can make loan modifications neutral or beneficial to the structure; others can, in the extreme, reduce subordination 200 bps at the BBB level.

The Unknown Unknowns

But there are a great many unknowns in the loan modification question. There are purely analytic questions. We haven't discussed interest shortfalls, nor behavior where interest rates rise.

Triggers can become important in the loan mod discussion. In certain situations, modification of a loan could make what would normally be a delinquent loan current, and may actually allow a deal to pass its delinquency trigger and step down. The delay of losses may also help a deal pass its trigger. The stepdown, as we have discussed in previous *Mortgage Strategists*, benefits and injures different parts of the capital structure. These issues are not covered in

prospectuses or in pooling and servicing agreements, and would have to be negotiated as part of a loan modification agreement.

But the greatest unknown is whether the market, regulators, and other industry players can overcome the formidable legal and procedural obstacles to making wholesale loan mods possible at all.