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The Impact of WAC Dispersion on IO Valuations

The recent issuance of Fannie Mae STRIP deal FNS-305 provides an ideal starting point for examining the dependence of IO valuations on WAC dispersion.⁷

Preliminary information indicates that FNS-305 consists of 26 IO tranches, with each tranche backed by loans from Countrywide's excess servicing portfolio. The deal is distinguished by the fact that for each group of collateral backing the deal, the coupons for the loans span a range of only 50bp. For example, one of the tranches in the deal is backed only by loans with coupons between 6.5% and 7%. This article examines whether there is value in such a "low WAC dispersion" IO relative to a trust IO with comparable aggregate collateral characteristics. We conclude that:

- The theoretical pay-up for a "low WAC dispersion" IO over the typical trust IO is negligible, since (1) the typical trust IO has only marginally more WAC dispersion, and (2) the refinance response curve is very nearly linear in this range.
- In extreme cases in which a trust has a WAC dispersion of about 200bp, the dispersion can subtract *or* add to the value of the IO by as much as a quarter-point.

WAC Dispersion Data

Initially, the most important questions that need to be answered are (1) how we estimate the WAC dispersion for a given trust, and (2) what is the "typical" WAC dispersion for a trust. To address the first question, we could estimate the WAC dispersion of a trust by simply taking the difference between the highest and the lowest loan coupons in the trust. However, our investigations show that this measure grossly overstates the amount of WAC dispersion because the loan coupons for a typical trust are mostly tightly clustered around the mean coupon and are far from being uniformly distributed between the low and high coupons in the trust. A more reasonable measure of WAC dispersion is to estimate the percentage (by balance) of the trust that lies within a particular range of coupons.⁸

Figure 35 shows the results of using this measure to estimate the WAC dispersion for some benchmark Freddie Mac trusts, thus addressing the second question posed above. The figure demonstrates that on average, more than 90% of the balance of these trusts lies within +/-37.5bp of the trust WAC. In other words, the WAC dispersion for these trusts is effectively about 75bp. A very conservative reading of the numbers would place the dispersion at 100bp.

⁷ The "WAC dispersion" of a trust typically refers to the dispersion of WACs for all pools in the trust. Somewhat confusingly, the term is also frequently used to refer to the loan-level dispersion of mortgage coupons in a trust. We will retain the latter usage, though the more accurate term would be "coupon dispersion."

⁸ In general, our dispersion measure coincides with the high-coupon-low-coupon dispersion measure only when the loan coupons in a trust are uniformly distributed between the low and high coupons. The published description of FNS-305 suggests that it is an exceptional case where the two measures will agree.

WAC dispersion for the benchmark trusts averages about 75bp.

Figure 35. WAC Dispersion on Selected Benchmark Freddie Mac Trusts^a

Trust	Coupon	WAC	WALA	% Outstanding in Range		
				WAC ± 25bp	WAC ± 37.5bp	WAC ± 50bp
FHL.PC.197	6.00 %	6.77 %	74	78 %	99 %	99 %
FHL.PC.192	6.50 %	7.23 %	23	66 %	98 %	100 %
FHL.PC.194	6.50	7.08	20	86	92	99
FHL.PC.203	6.50	7.02	7	89	90	92
FHL.PC.177	7.00 %	7.54 %	43	91 %	100 %	100 %
FHL.PC.183	7.00	7.63	33	80	92	100
FHL.PC.205	7.00	7.51	4	82	90	98
FHL.PC.188	7.50 %	8.02 %	28	77 %	77 %	100 %
FHL.PC.191	8.00 %	8.49 %	35	85 %	96 %	99 %
Average:				82 %	93 %	99 %

^a WAC dispersion calculated using pool-level WAC quartile data.

Source: Salomon Smith Barney.

These results were obtained by using the available coupon quartile data on Freddie Mac pools.⁹ Each month, Freddie Mac provides data on both the lowest and the highest loan coupon in each coupon quartile for a pool. To estimate the distribution of coupons in the trust, we cycle through all pools in the trust, estimate the average coupon¹⁰ for each coupon quartile associated with each pool, and then assign the quartile balance to a coupon bucket based on this average coupon. To address the possibility that there may be significant dispersion within a coupon quartile, we calculated the average difference between the low and high coupons in a quartile over every quartile in a trust. This difference is 12.5bp or less, indicating that there is limited coupon dispersion within a coupon quartile.

The Value of WAC Dispersion

WAC dispersion can hurt or help IOs.

If quantifying WAC dispersion is critical, it is equally important to understand the significance of WAC dispersion for valuations. WAC dispersion can either hurt or help an IO. For example, given the S-shape of the refinance response curve, it is not difficult to visualize cases in which an IO can actually benefit from greater dispersion. In general, by aggregating the coupons for a group of loans into a single WAC, we are introducing some approximation error into our valuations. To reduce this error, we can “bucket” the collateral into two or more groups for our valuations. By using a sufficient number of buckets, we can closely estimate the value created or subtracted by the WAC dispersion for a particular trust.

Since the results in Figure 35 show that most of the loan coupons are concentrated within +/-37.5bp of the trust WAC, we could choose our buckets based on the assumption that the coupons in the trust are normally distributed in this range. **However, in our valuations in Figure 36, we choose our buckets based on the conservative assumption that the loan coupons in the trust are uniformly distributed within +/-50bp of the trust WAC.** For example, in the calculations for PC.197, the trust was bucketed into two collateral groups with average coupons of

⁹ Fannie Mae does not release quartile data on its pools.

¹⁰ Average Coupon = (High Coupon + Low Coupon)/2.

6.52% and 7.02%, respectively,¹¹ and then into four collateral groups with average coupons of 6.4%, 6.65%, 6.9%, and 7.15%, respectively. Figure 36 summarizes the results of our analysis. It shows that the valuations for the benchmark trusts are minimally affected by WAC dispersion, even if we make the punitive assumption described above. The largest difference is for PC.188 IO — the WAC dispersion for this trust IO adds about four ticks. In other cases (PC.197, PC.203, and PC.205), dispersion lowers the price by about two ticks.

*WAC dispersion
minimally affects the
valuations of benchmark
Freddie Mac trusts.*

Figure 36. Dependence of IO Valuations on WAC Dispersion, 15 Nov 99

Trust IO	Coupon	IO Price @ 100 OAS ^a	IO Price @ 100 OAS Using WAC Buckets		
			2 Buckets	4 Buckets	8 Buckets
FHL.PC.197	6.00 %	31-14	31-12	31-11	31-11
FHL.PC.192	6.50	30-13	30-13	30-13	30-13
FHL.PC.194	6.50	31-13	31-13	31-13	31-13
FHL.PC.203	6.50	32-27	32-25	32-25	32-25
FHL.PC.177	7.00	29-18	29-19	29-19	29-19
FHL.PC.183	7.00	29-17	29-19	29-19	29-19
FHL.PC.205	7.00	32-12	32-11	32-10	32-10
FHL.PC.188	7.50	30-19	30-23	30-23	30-23
FHL.PC.191	8.00	30-15	30-15	30-15	30-15

^a Using a single WAC.

Source: Salomon Smith Barney.

Note that we are not arguing that WAC dispersion is not important in valuations for *all* trusts — our argument is simply that it is not important for the typical trust because of its limited dispersion. Put another way, WAC dispersion has little impact on valuations for most trusts because over the range of dispersion present in the trusts, the refinance response curve is very nearly linear.

For certain pathological trusts with nearly uniform distribution of coupons within +/- 100bp of the WAC — almost three times the dispersion in a typical trust — WAC dispersion can make a difference to valuations. Figure 37 summarizes the results of computations that assume that the listed trusts have a WAC dispersion of about 200bp. Under these extreme assumptions, WAC dispersion can alter the value of an IO by as much as a quarter-point, again either up or down.

¹¹ More specifically, in the two-bucket case we assume that the coupons on the loans in the first bucket are uniformly distributed between 6.27% and 6.77% (which results in a WAC of 6.52%), and in the second bucket between 6.77% and 7.27% (which results in a WAC of 7.02%).

Figure 37. IO Valuations Assuming Hypothetical WAC Dispersion of 200bp, 15 Nov 99

Trust IO	Coupon	IO Price @ 100 OAS ^a	IO Price Using WAC Buckets		
			2 Buckets	4 Buckets	8 Buckets
FHL.PC.197	6.00 %	31-14	31-07	31-06	31-06
FHL.PC.192	6.50	30-13	30-14	30-14	30-14
FHL.PC.194	6.50	31-13	31-12	31-11	31-11
FHL.PC.203	6.50	32-27	32-21	32-19	32-19
FHL.PC.177	7.00	29-18	29-21	29-23	29-23
FHL.PC.183	7.00	29-17	29-23	29-25	29-25
FHL.PC.205	7.00	32-12	32-07	32-07	32-06
FHL.PC.188	7.50	30-19	30-30	30-30	30-30
FHL.PC.191	8.00	30-15	30-17	30-19	30-19

^a Using a single WAC.

Source: Salomon Smith Barney.

In the presence of significant WAC dispersion, accurate results may be obtained by using four buckets.

A final point worth making is that accurate determinations of value are possible for trusts with significant amounts of WAC dispersion by using collateral bucketing. As the results in Figures 58 and 59 demonstrate, using as few as four buckets results in valuations that are accurate to within $1/32$ of a point.