

Yield Book Agency MBS: How valid is the current CMM102 calculation?

Incorporating liquidity scoring to strengthen price interpolation for the CMM102 coupon

December 2022

AUTHOR

Albert Durso

RMBS and CMBS Senior Strategist.

Albert.Durso2@lseg.com

Introduction

While employed as a linchpin for models that incorporate primary/secondary mortgage rate spreads, which ultimately charts prepayments, the CMM102 coupon has floundered in the recent market volatility, raising questions over the validity of its inherent characteristics.

To illustrate, in our study, we have taken two main pricing coupons for CMM102 -- 30yr UMBS/FNMA 6%*s* and 6.5%*s* with the higher coupon experiencing the usual bouts of initial illiquidity, erratic marks, eliciting doubt among its users.

As the market explores new price levels, with interest rates suddenly shifting, the newer coupons are not yet fully supported, while the bid levels associated with the higher coupons are not reliable, making it a difficult task when trying to solve for a 102 strike that the industry currently depends upon.

Simple price interpolation does not address the lack of reliable marks and so we embarked on a project to incorporate both price levels and liquidity to arrive at a more dependable CMM102.

Our test covers issuance that defines the forward TBA contract upon settlement, trading flows that measure the depth of liquidity, as well as bid: ask spreads that are highly indicative of either a thinly traded market or one of depth and dependable execution.

With these parameters, we examined the validity of these marks used to interpolate and re-calculate CMM102.

As CMM102 is an interpolation of prices relative to strike to coupons, our liquidity weighting maintains the same, assigning value to each basis point of interpolation that pricing accomplishes which is a 50 basis points (bps) interval between constituent coupons.

Contents

Backdrop to Liquidity	3
Trading Volume	5
Issuance Levels	6
Bid: Ask Spreads	6
Using the Scoring System	7
Total Scores and Coupon Weightings	8
Using Constant OAS Spread to Better Equate Producible Coupons	9
Primary/Secondary Spreads, Issuance and Borrower Psychology	10
Synthetic CMM102 Primary / Secondary Spread	11
Summary	12

Backdrop to Liquidity

Over the past several years, the Federal Reserve has kept interest rates capped with massive MBS and Treasury buying operations.

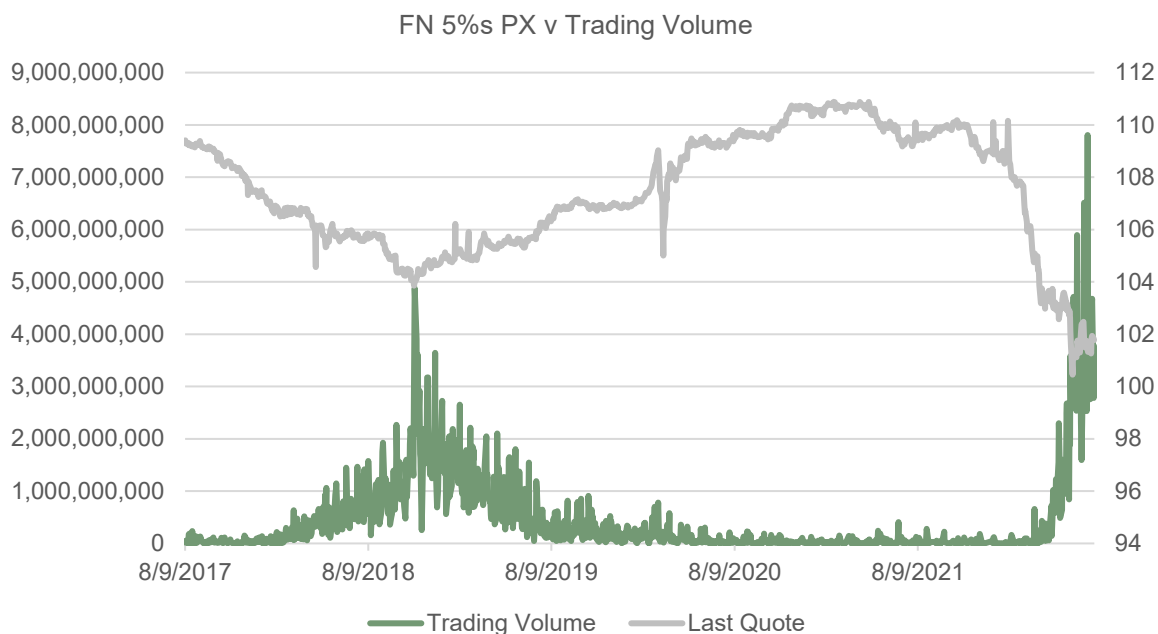
But once the Fed removed itself from the markets, volatility spiked, and overall liquidity suffered as buyers were able to pick and choose their re-entry points.

Prices fell precipitously in 2022. The MBS index lost 20 points this year alone and at one point nine out of the 11 TBA coupons on the stack traded at a discount to par.

Trading in premium coupons became a lonely existence, as there was little pool issuance to support the market, limited TBA hedging, and ultimately gapping bid: ask markets as a result.

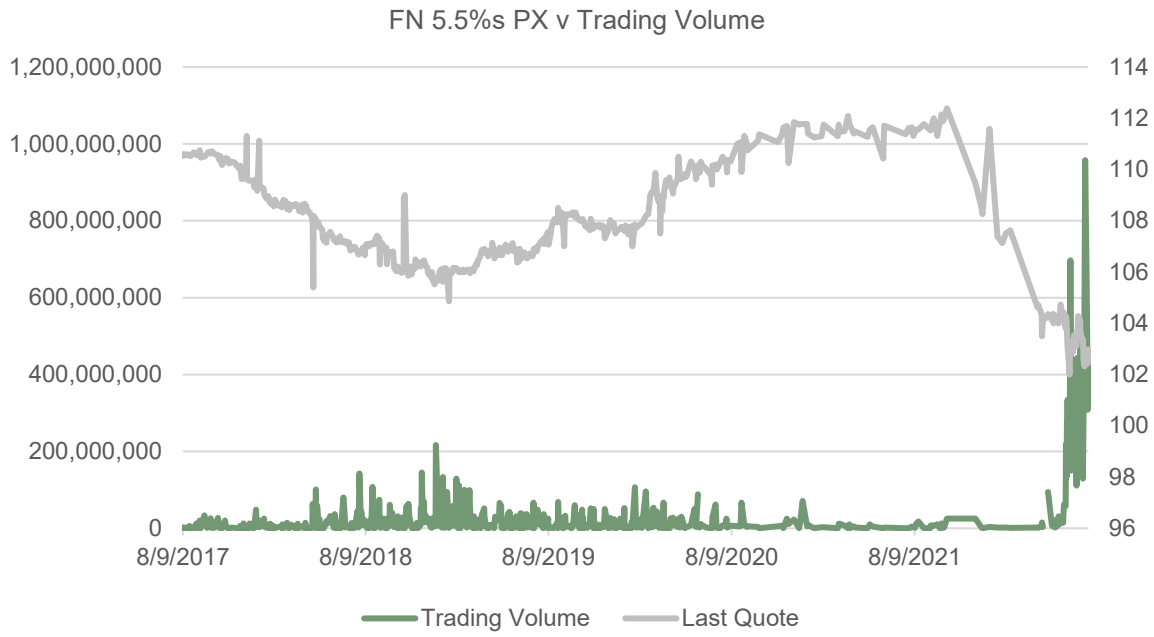
As the following price to volume charts (charts 1 through 4) indicate, higher TBA dollar prices coincide with low or no trading volume.

Chart 1



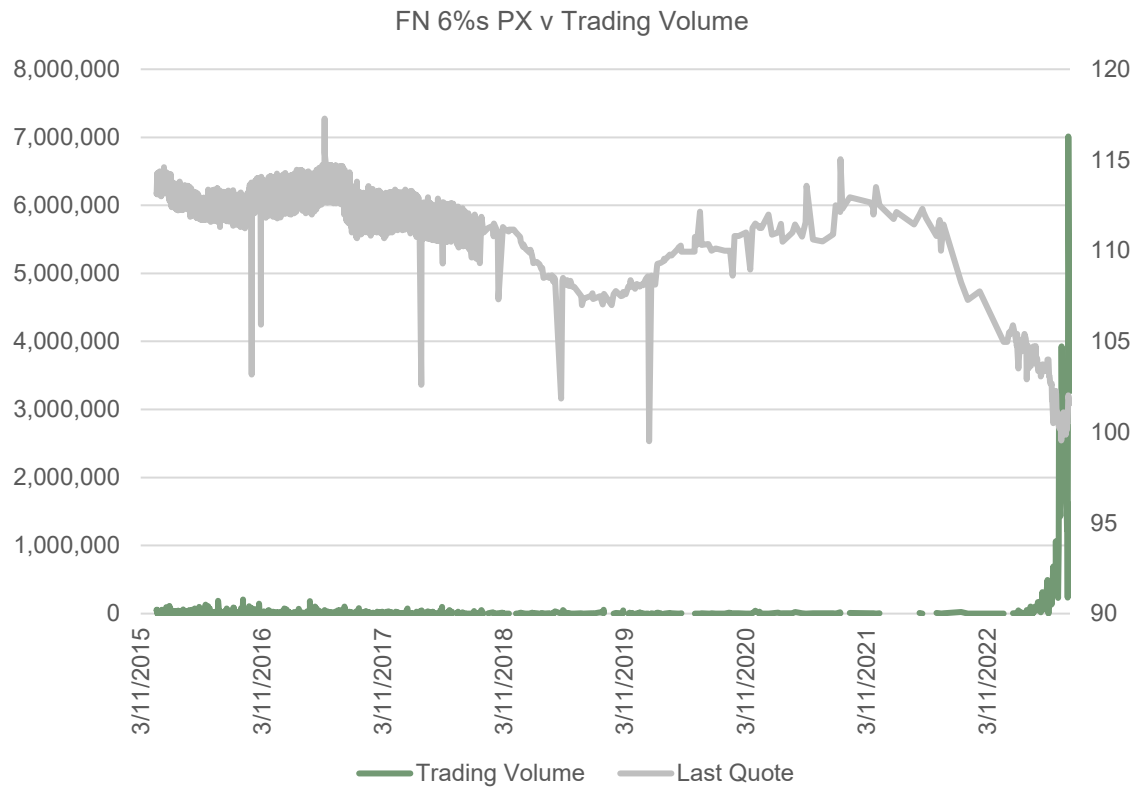
Source: FINRA/TRACE

Chart 2



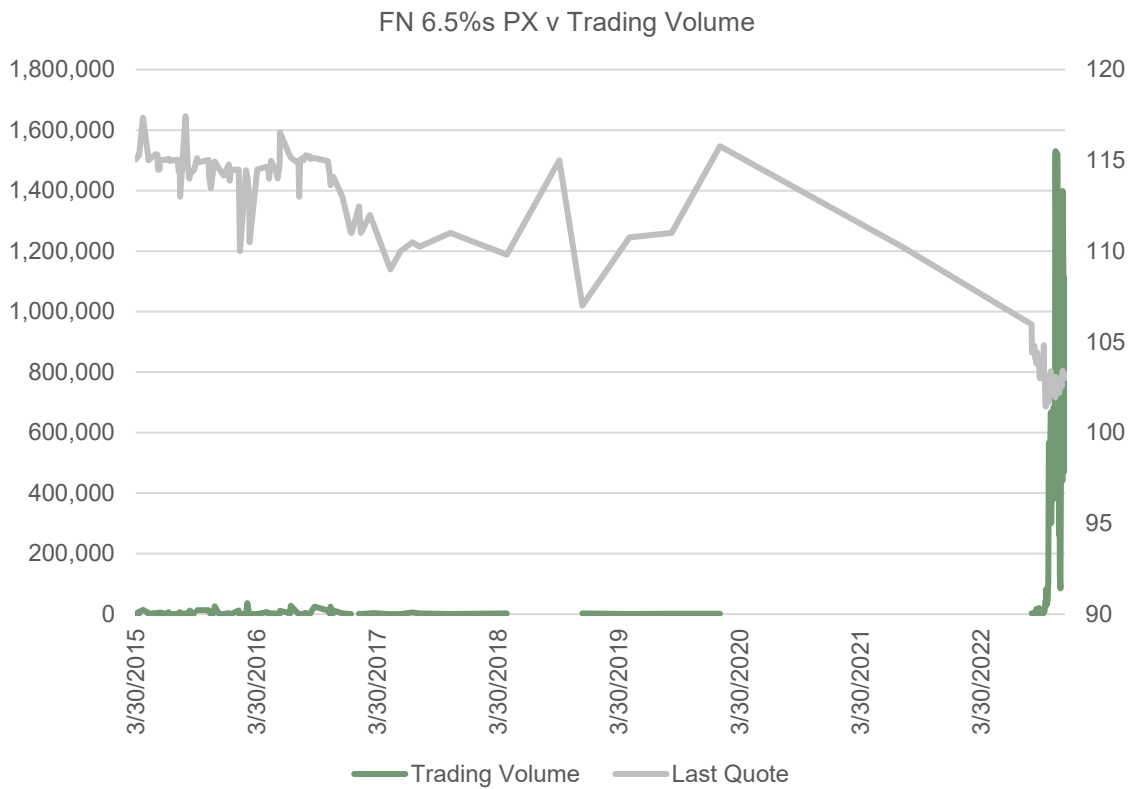
Source: FINRA/TRACE

Chart 3



Source: FINRA/TRACE

Chart 4



Source: FINRA/TRACE

Trading Volume

One of the first aspects to a liquid market is the depth of trading within, and the volume executed daily in that sector.

For TBA trades, we accessed FINRA’s TRACE system, forgoing pool trading, dollar rolls and “stip” trades and instead focused on forward TBA contracts that define the CMM calculations.

In our test, we set ranges and assigned scores associated with daily trading volume as follows:

- IF FINRA DAILY TRADING VOLUME is <100mm 0 Weighting
- IF FINRA DAILY TRADING VOLUME is >100mm but <500mm 1 Weighting
- IF FINRA DAILY TRADING VOLUME is >500mm but <1billion 2 Weighting
- IF FINRA DAILY TRADING VOLUME is >1billion but <2billion 3 Weighting
- IF FINRA DAILY TRADING VOLUME is >2billion but <3billion 4 Weighting
- IF FINRA DAILY TRADING VOLUME is >3billion 5 Weighting

These ranges were derived after observing the daily trading volume across all coupons on TRACE.

Issuance Levels

Agency issuance, which is reported the first week of each month, remains constant when used for a daily weighting variable. It is a direct indication of originations and ultimately support for the TBA contract, which is populated when pools are allocated into the open contract upon settlement (48-hour day pool notification).

A lack of issuance will decrease liquidity in the market, conversely ample issuance will support depth of market theoretically.

Our weightings are as follows:

IF ISSUANCE for that Month is <100mm	0 Weighting
IF ISSUANCE for that Month is >100mm but <1billion	1 Weighting
IF ISSUANCE for that Month is >1 billion but <3billion	2 Weighting
IF ISSUANCE for that Month is >3billion but <5billion	3 Weighting
IF ISSUANCE for that Month is >5billion but <7billion	4 Weighting
IF ISSUANCE for that Month is >7 billion	5 Weighting

Again, these ranges were selected after observing monthly reporting figures from the agencies over the past several months.

Bid: Ask Spreads

The third barometer of liquidity used is the bid: ask spreads accessed via Trade Web (at 3pm daily). This market is "request for quote" (RFQ), using an algorithm derived from dealer-to-dealer trading markets (Dealer Web) and movements in rates and Treasuries.

Although these are not actual trades, frequency and fluidity of trades are still highly indicative of liquidity.

Our weightings for bid: ask spreads are as follows:

IF BID ASK IS BLANK OR > 1pt	0 Weighting
IF BID ASK IS <1pt but > 3/4 of 1 PT	1 Weighting
IF BID ASK IS <3/4 of 1 PT but >1/2 PT	2 Weighting
IF BID ASK IS <1/2 of 1 PT but >1/4 PT	3 Weighting
IF BID ASK IS <1/4 of 1 PT but >2/32nds	4 Weighting
IF BID ASK IS <2/32nds	5 Weighting

Daily origination hedging totals (of TBAs), although a direct reflection of pipeline hedging and forward issuance, has no standardized documentation and is subject to counterparty experience. Hence, it was omitted from our scoring.

Using the Scoring System

The CMM strike is calculated daily, so our scoring system is updated daily as well, with issuance held constant day over day (monthly figure).

Once the individual or “Sub” scores are calculated on the two constituent coupons, each of the three categories are summed and divided by the total score for both constituents. Ratios are then applied to each coupon to proportion the 50bps between constituent coupons. After this is solved, pricing is incorporated, using an average between the two CMM components, pricing, and liquidity. In that way, we have added pricing back into our coupon weightings and updated the CMM to better reflect liquidity as a function of price.

In table 1, you can find October’s recap of coupon scoring across trading volume, bid: ask, and issuance scored across our metric using FNMA 6% and FNMA 6.5%

Table 1

	FINRA trading volume				TW BID ASK(32nds)				Issuance			
	6.5		6.0		6.5		6.0		6.5		6.0	
	sub score	sub score	sub score	sub score	sub score	sub score	sub score	sub score	sub score	sub score	sub score	
31-Oct	150,000,000	1	2,434,760,000	4	9.5	3	7.0	4	596,000,000	1	2,497,000,000	2
28-Oct	250,700,000	1	2,311,800,000	4	6.0	4	4.0	4	596,000,000	1	2,497,000,000	2
27-Oct	654,250,000	2	2,756,684,000	4	6.0	4	4.5	4	596,000,000	1	2,497,000,000	2
26-Oct	532,600,000	2	2,811,818,000	4	3.5	4	0.5	5	596,000,000	1	2,497,000,000	2
25-Oct	449,500,000	1	2,491,575,000	4	6.0	4	5.5	4	596,000,000	1	2,497,000,000	2
24-Oct	468,800,000	1	2,125,233,000	4	7.5	4	4.0	4	596,000,000	1	2,497,000,000	2
21-Oct	520,900,000	2	4,223,963,000	5	9.0	3	7.5	4	596,000,000	1	2,497,000,000	2
20-Oct	284,022,000	1	2,269,517,000	4	10.5	3	3.0	4	596,000,000	1	2,497,000,000	2
19-Oct	106,700,000	1	3,485,007,000	5	36.0	0	3.5	4	596,000,000	1	2,497,000,000	2
18-Oct	79,000,000	0	1,720,896,000	3	26.5	1	1.5	5	596,000,000	1	2,497,000,000	2
17-Oct	46,050,000	0	1,470,150,000	3	21.0	2	3.5	4	596,000,000	1	2,497,000,000	2
14-Oct	15,866,000	0	1,990,075,000	3	13.0	3	1.5	5	596,000,000	1	2,497,000,000	2
13-Oct	59,250,000	0	3,492,372,000	5	52.5	0	4.5	4	596,000,000	1	2,497,000,000	2
12-Oct	31,200,000	0	1,034,986,000	3	63.5	0	5.0	4	596,000,000	1	2,497,000,000	2
11-Oct	26,500,000	0	1,282,199,000	3	72.0	0	1.5	5	596,000,000	1	2,497,000,000	2
7-Oct	3,400,000	0	564,250,000	2	45.5	0	6.0	4	596,000,000	1	2,497,000,000	2
6-Oct	-	0	216,250,000	1	43.5	0	3.0	4	596,000,000	1	2,497,000,000	2
5-Oct	3,000,000	0	238,800,000	1	72.5	0	3.50	4	596,000,000	1	2,497,000,000	2
4-Oct	4,100,000	0	248,650,000	1	96.5	0	3.5	4	596,000,000	1	2,497,000,000	2
3-Oct	1,800,000	0	210,000,000	1	97.0	0	5.0	4	596,000,000	1	2,497,000,000	2

Source: FINRA, TRACE, TradeWeb, eMBS

Total Scores and Coupon Weightings

Adding the “sub” scores (in table 1) and deriving a percentage of the sub score versus the total scoring brings us to a weighting between the two principal coupons.

Table 2

CMM	WGT'd	Synthetic	Date	PMMS	PS102	WGT	PSSYNTHETIC	Total scores			WGT		CPN	
102														
6.402	6.167	6.284	31-Oct	7.080	0.68	0.91	0.80	5.0	10.0	15.0	0.3333	0.667	2.17	4.00
6.3	6.188	6.244	28-Oct	7.080	0.78	0.89	0.84	6.0	10.0	16.0	0.3750	0.625	2.44	3.75
6.221	6.206	6.213	27-Oct	7.080	0.86	0.87	0.87	7.0	10.0	17.0	0.4118	0.588	2.68	3.53
6.326	6.194	6.260	26-Oct	6.940	0.61	0.75	0.68	7.0	11.0	18.0	0.3889	0.6111	2.53	3.67
6.397	6.188	6.292	25-Oct	6.940	0.54	0.75	0.65	6.0	10.0	16.0	0.3750	0.625	2.44	3.75
6.502	6.188	6.345	24-Oct	6.940	0.44	0.75	0.60	6.0	10.0	16.0	0.3750	0.625	2.44	3.75
6.488	6.176	6.332	21-Oct	6.940	0.45	0.76	0.61	6.0	11.0	17.0	0.3529	0.647	2.29	3.88
6.605	6.167	6.386	20-Oct	6.940	0.34	0.77	0.55	5.0	10.0	15.0	0.3333	0.667	2.17	4.00
6.468	6.077	6.272	19-Oct	6.920	0.45	0.84	0.65	2.0	11.0	13.0	0.1538	0.846	1.00	5.08
6.351	6.083	6.217	18-Oct	6.920	0.57	0.84	0.70	2.0	10.0	12.0	0.1667	0.833	1.08	5.00
6.405	6.125	6.265	17-Oct	6.920	0.52	0.80	0.65	3.0	9.0	12.0	0.2500	0.750	1.63	4.50
6.439	6.143	6.291	14-Oct	6.920	0.48	0.78	0.63	4.0	10.0	14.0	0.2857	0.714	1.86	4.29
6.385	6.042	6.213	13-Oct	6.920	0.54	0.88	0.71	1.0	11.0	12.0	0.0833	0.917	0.54	5.50
6.342	6.050	6.196	12-Oct	6.660	0.32	0.61	0.46	1.0	9.0	10.0	0.1000	0.900	0.65	5.40
6.318	6.045	6.182	11-Oct	6.660	0.34	0.61	0.48	1.0	10.0	11.0	0.0909	0.909	0.59	5.45
6.26	6.056	6.158	7-Oct	6.660	0.40	0.60	0.50	1.0	8.0	9.0	0.1111	0.889	0.72	5.33
6.204	6.063	6.133	6-Oct	6.660	0.46	0.60	0.53	1.0	7.0	8.0	0.1250	0.875	0.81	5.25
6.065	6.063	6.064	5-Oct	6.700	0.64	0.64	0.64	1.0	7.0	8.0	0.1250	0.875	0.81	5.25
5.977	5.294	5.826	4-Oct	6.700	0.72	1.41	0.87	1.0	7.0	8.0	0.1250	0.875	0.81	5.25
6.038	6.063	6.050	3-Oct	6.700	0.66	0.64	0.65	1.0	7.0	8.0	0.1250	0.875	0.81	5.25

The last two columns (titled CPN in table 2) is the coupon allocation of the 50bps between the two constituents. The second column (titled WGT'd in table 2) is the total coupon arrived at.

As the table indicates, the results are heavily biased toward lower and more liquid 6%, with the percentages of coupon lending further support to the results.

From the price based CMM102 in the first column, you can observe the difference against the Weighted to be 30bps and 20-25 against Synthetic at their widest points.

Again, our method ignores price movements while the prevailing methods disregard lack of price dependability (liquidity).

Taking a closer look at the results from 31 October 2022:

- CMM102 figures 80% 6.5%, 20% 6% using price alone.
- Weighted CMM that we calculated shows 67% 6% and 33% 6.5%.

- The 6.5 price allocation of 80% added to the liquidity allocation of 33%, divided by 2, drops the weighing down to a 56.6% and the coupon contribution to 3.679.
- 6s similarly calculate the to a 43.4% split (20% +66%/2), contributing 2.601 instead of 1.2.
- Total CMM102 Synthetic (weighted/price) is 6.28, or the sum of 3.679+2.601.

Using Constant OAS Spread to Better Equate Produccible Coupons

Instead of laddering up to the current Primary Mortgage Market Survey (PMMS), we have used the Current Coupon Option Adjusted Spread (CCOAS) to arrive at a more producible primary rate that better tracks true borrowing levels.

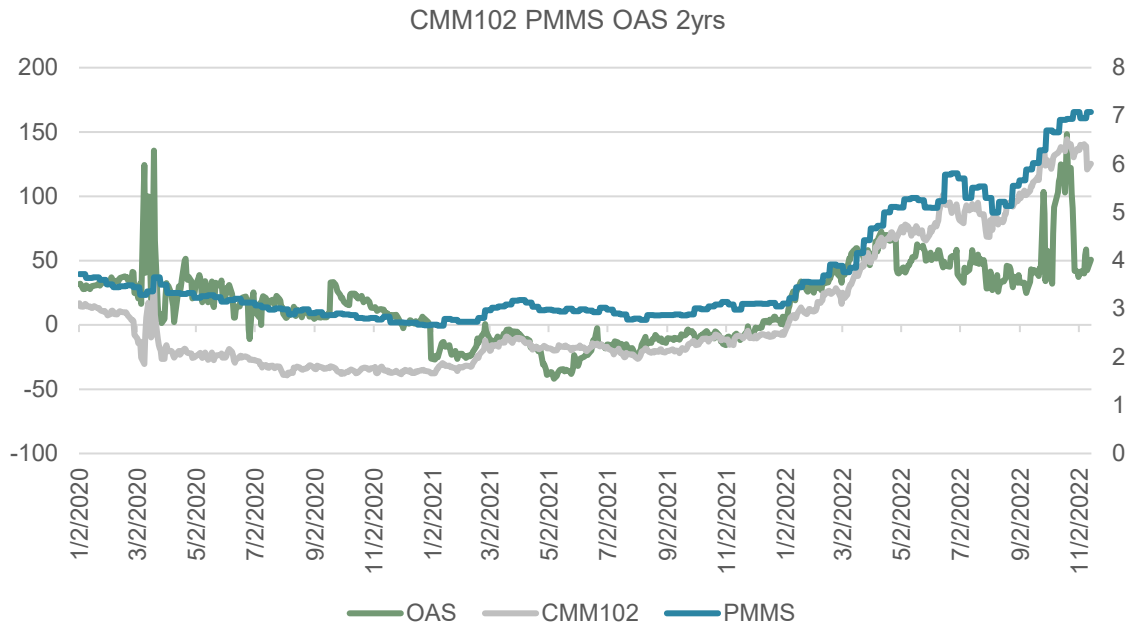
The 2yr CMM102 OAS average is about 50 bps (chart 5). Leveraging this arrives at a 6.72 primary rate (6.22 synthetic CMM + 50 bps CCOAS). Best execution from there (80bps) slots a net coupon of 6% or 5.5% - which is more in line to daily originator hedging and issuance (table 3).

Table 3

	FNMA	4%	4.50%	5%	5.50%	6%	6.50%	7%
1-Nov	1,800.00		-171	514	-67	552	189	111
2-Nov	2,400.00	357	568	-1501	788	110	288	
3-Nov	2,300.00	-85	-128	157	148	710	546	54
4-Nov	1,500.00	-29	-108	38	298	266	324	19
7-Nov	1,300.00	-70	-13	-6	-73	326	330	14
8-Nov	2,000.00	-253	105	98	562	358	476	13
9-Nov	1,400.00	-38	234	134	-63	198	333	44
10-Nov	1,900.00	-100	75	310	-160	1345	-148	6
14-Nov	1,800.00	-66	220	182	492	539	-89	-91
15-Nov	2,000.00	43	-182	77	297	865	-18	29
16-Nov	2,000.00	109	-61	-215	852	423	234	-4
17-Nov	1,500.00				734	114	196	
18-Nov	1,700.00		-138	255	398	394	75	17
21-Nov	2,100.00		-17	446	118	434	215	13
22-Nov	1,900.00	91	54	100	211	396	249	24
23-Nov	500.00	-17	-11	15	270	21	83	14
25-Nov	400.00		163	-22	47	10		
28-Nov	1,200.00		50	182	29	181	192	20
29-Nov	1,900.00	20	51	22	605	57	440	2
30-Nov	1,300.00	94	12	-189	543	72	204	20
Total	32,900.00	56.00	703.00	597.00	6,029.00	7,371.00	4,119.00	305.00
Daily avg	1,645.00	0.17%	2.14%	1.81%	18.33%	22.40%	12.52%	0.93%

Source: Yield Book

Chart 5



Source: Yield Book

Primary/Secondary Spreads, Issuance and Borrower Psychology

When retail lending rates surged above 7% in late October/early November it was noteworthy that the bulk of agency issuance was concentrated among 30yr 5.5%s and 5% than 6% and 6.5s.

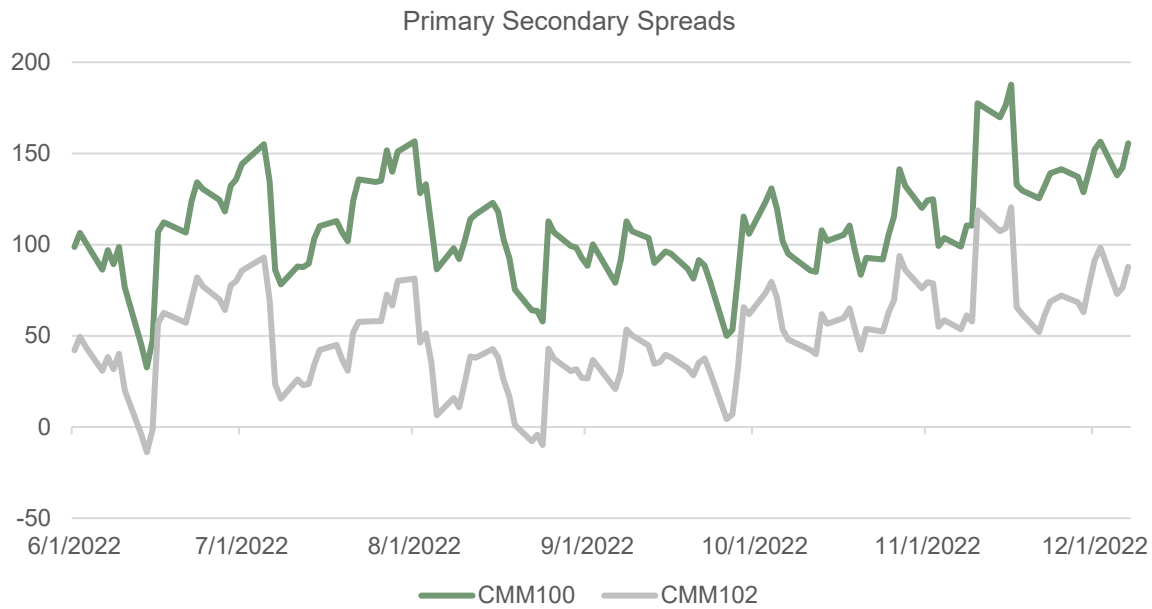
This was mainly due to borrower psychology, appearing spooked by a 7% handle on their mortgage. Borrowers would rather pay “points” up front to lower the interest rate than be saddled with the stigma of locking in at the recent high-water mark.

After netting down from the aforementioned whole loan rate, deducting G-fees and servicing (call it 80bps), the net coupon would have slotted between a 6% and a 6.5%. However, production was more prevalent in 5.5% and 6% as points paid upfront lowered that slotting.

In chart 6, CMM100 and CMM102 primary/secondary spreads over the past six months display similar patterns, both spiking on 10 November when rates and MBS rallied causing yields to dive (FHLMC PMMS held constant as it’s a weekly lookback print).

Both spreads displayed six-month highs and moved 25 standard deviations, with the increase from the averages 2.2 times for CMM102 and 1.59 times for CMM100.

Chart 6



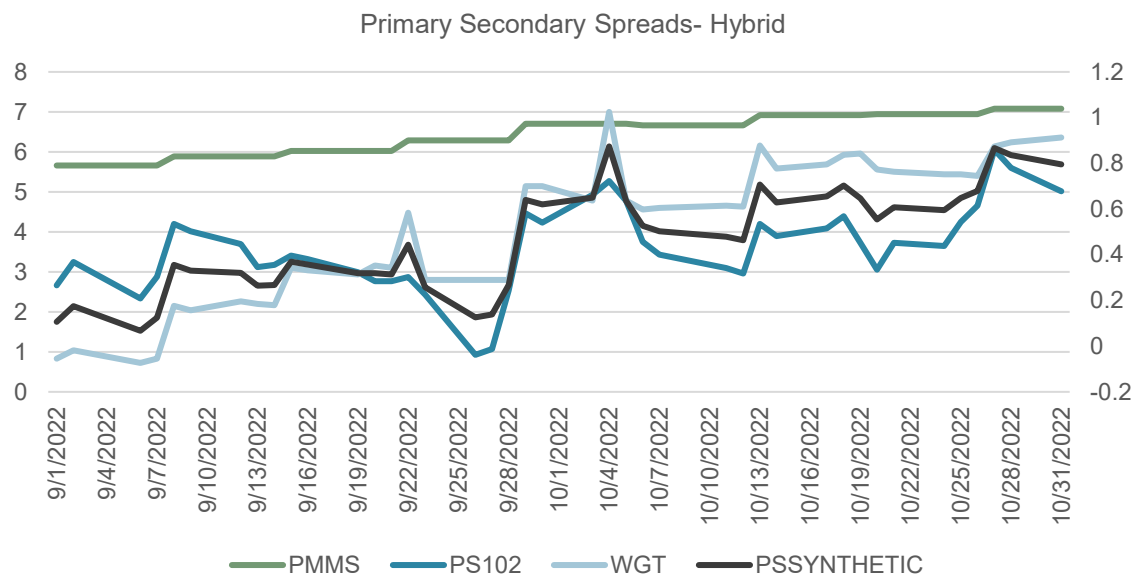
Source: Yield Book

Synthetic CMM102 Primary / Secondary Spread

The arch of the primary/secondary spreads (chart 7) are somewhat in harmony, relative to their trajectory, while the drop off at the end of October is more dramatic on price based CMM102 than on the hybrid synthetic primary/secondary result (PSSYNTHETIC).

Volatile price action was at the center of that move while a hybrid approach (weighted and price interpolation) is more measured.

Chart 7



Source: Yield Book

Summary

In summary, we see that the

- Current CMM102 has flaws founded in price movements and when markets are thinly supported.
- Weighted scoring alone disregards the foundation of price to plot CMM strike
- Hybrid method incorporates both price and weightings, more reasonable approach
- Arch of primary/secondary spreads become less noisy among hybrid (Synthetic), mutes price volatility (Q3/Q4)

About Yield Book

Yield Book is a trusted and authoritative source for fixed income analytics that enables market makers and institutional investors to perform complex analysis of their portfolios, benchmarks, trading decisions, historical performance, and risk. Yield Book products offer analytical insight into an extensive range of financial products in the fixed income space including governments, agencies, corporates, high yield, emerging markets, mortgages, ABS, CMBS, CMOs, and derivatives. The platform utilizes dedicated centralized servers that help ensure reliable, prompt data delivery. Yield Book forms part of London Stock Exchange Group (LSEG)'s Data and Analytics division.

To learn more, email sales@yieldbook.com; [request a demo](#); visit yieldbook.com; or call your regional Client Service Team office

Americas

+1 646 989 2200

EMEA

+44 20 7334 8963

Asia-Pacific

Hong Kong +852 2164 3333

Tokyo +81 3 6441 1430

Taipei +866 2 8726 9778

© 2022 London Stock Exchange Group plc and its applicable group undertakings (the "LSE Group"). The LSE Group includes (1) FTSE International Limited ("FTSE"), (2) Frank Russell Company ("Russell"), (3) FTSE Global Debt Capital Markets Inc. and FTSE Global Debt Capital Markets Limited (together, "FTSE Canada"), (4) FTSE Fixed Income Europe Limited ("FTSE FI Europe"), (5) FTSE Fixed Income LLC ("FTSE FI"), (6) The Yield Book Inc ("YB") and (7) Beyond Ratings S.A.S. ("BR"). All rights reserved.

FTSE Russell® is a trading name of FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB and BR. "FTSE®", "Russell®", "FTSE Russell®", "FTSE4Good®", "ICB®", "The Yield Book®", "Beyond Ratings®" and all other trademarks and service marks used herein (whether registered or unregistered) are trademarks and/or service marks owned or licensed by the applicable member of the LSE Group or their respective licensors and are owned, or used under licence, by FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB or BR. FTSE International Limited is authorised and regulated by the Financial Conduct Authority as a benchmark administrator.

All information is provided for information purposes only. All information and data contained in this publication is obtained by the LSE Group, from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors, however, such information and data is provided "as is" without warranty of any kind. No member of the LSE Group nor their respective directors, officers, employees, partners or licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or of results to be obtained from the use of FTSE Russell products, including but not limited to indexes, data and analytics, or the fitness or suitability of the FTSE Russell products for any particular purpose to which they might be put. Any representation of historical data accessible through FTSE Russell products is provided for information purposes only and is not a reliable indicator of future performance.

No responsibility or liability can be accepted by any member of the LSE Group nor their respective directors, officers, employees, partners or licensors for (a) any loss or damage in whole or in part caused by, resulting from, or relating to any error (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analysing, editing, transcribing, transmitting, communicating or delivering any such information or data or from use of this document or links to this document or (b) any direct, indirect, special, consequential or incidental damages whatsoever, even if any member of the LSE Group is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

No member of the LSE Group nor their respective directors, officers, employees, partners or licensors provide investment advice and nothing in this document should be taken as constituting financial or investment advice. No member of the LSE Group nor their respective directors, officers, employees, partners or licensors make any representation regarding the advisability of investing in any asset or whether such investment creates any legal or compliance risks for the investor. A decision to invest in any such asset should not be made in reliance on any information herein. Indexes cannot be invested in directly. Inclusion of an asset in an index is not a recommendation to buy, sell or hold that asset nor confirmation that any particular investor may lawfully buy, sell or hold the asset or an index containing the asset. The general information contained in this publication should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional.

The information contained in this report should not be considered "research" as defined in recital 28 of the Commission Delegated Directive (EU) 2017/593 of 7 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council ("MiFID II") and is provided for no fee.

Past performance is no guarantee of future results. Charts and graphs are provided for illustrative purposes only. Index returns shown may not represent the results of the actual trading of investable assets. Certain returns shown may reflect back-tested performance. All performance presented prior to the index inception date is back-tested performance. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. However, back-tested data may reflect the application of the index methodology with the benefit of hindsight, and the historic calculations of an index may change from month to month based on revisions to the underlying economic data used in the calculation of the index.

This document may contain forward-looking assessments. These are based upon a number of assumptions concerning future conditions that ultimately may prove to be inaccurate. Such forward-looking assessments are subject to risks and uncertainties and may be affected by various factors that may cause actual results to differ materially. No member of the LSE Group nor their licensors assume any duty to and do not undertake to update forward-looking assessments.

No part of this information may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the applicable member of the LSE Group. Use and distribution of the LSE Group data requires a licence from FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB, BR and/or their respective licensors.