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**In this research update, we look at the current Agency MBS market and answer two key questions: where are valuations today and what are the implications for an end to the Federal Reserve and Treasury purchase programs.**

To answer the first part of this question, we evaluate several valuation metrics and their relevance to the marginal buyer of Agency MBS. Table 1 compares current coupon (CC) spread levels with historical averages across various valuation methodologies.

Table 1

Nominal Spreads	As of 11/13/09	10 Year Average	Z-Score
CC vs. 5 Year Treasury	187	186	0.00
Adjusted for dollar price	187	183	0.10
CC vs. 5 Year Libor	155	126	0.70
Adjusted for dollar price	155	140	0.40
<b>Swaption Volatility</b>			
DVX Index	121	102	1.20
<b>Libor OAS Spreads</b>			
Yield Book	-32	-3	-1.80
Barclays	-14	4	-1.00
JP Morgan	-12	8	-1.10
Bank of America	-28	5	-2.00
<b>Relative Valuation vs. Other Sectors</b>			
MBS minus Corporate Spread	-199	-106	-0.90
MBS minus CMBS Spread	-503	-144	-1.60
MBS minus ABS Spread	-117	-96	-0.10

Source: Bloomberg, Bond Hub  
10 Year Average through 11/13/09

**Nominally, current coupon spreads are fair vs. Treasuries and cheap vs. Libor**

### Nominal Spreads

Nominal spreads represent “raw” yield differentials between the (CC) MBS and 5-year Treasury or Libor. We further use the price of the Barclays MBS Index to adjust nominal spreads for refi risk. Using this framework, Agency MBS look fairly priced versus Treasuries but still remain quite cheap versus Libor. Adjusted for dollar price, current coupon spreads can tighten 15bps vs. Libor.

### How do CC spreads adjusted for dollar price look when compared under different housing market macro environments?

In our analysis of past real estate cycles, two periods, 1991-1993 and 2002-2004, give us reference points for dollar price adjusted spread levels and home price appreciation (HPA). These two examples provide polar opposites for reference, in that the earlier period was a time of significant weakness in residential real estate and the latter represents a strong housing market. Referencing these two periods, we can see in Table 2 that current spreads appear cheap versus the 1991-1993 levels, even though housing is actually weaker now.



Table 2

Period	2009	2002-2004	1991-1993
Home Price Appreciation (HPA)	Weak	Strong	Weak
CC vs. 5 Year Treasury	187	221	165

Source: Barclays, as of 11/13/09

*In a weak HPA environment you are compensated for taking prepayment risk*

*We expect further mean reversion for swaption volatility, a positive for Agency MBS*

### *How about volatility?*

Recall that owning Agency MBS is similar to being long a bullet-like security and short call options. DVX, an index used to measure Swaption volatility, is positively correlated with CC nominal spreads (0.78 historical correlation for the past 10 years as of 11/13/09). Currently, the DVX index looks high versus its historical average and has not yet followed the mean-reversion displayed by other volatility markets such as MOVE (treasury volatility) and VIX (equity volatility). Additionally, our models indicate that adjusted for the curve and level of actual volatility, DVX may have further room to fall.

*Option adjusted spread measures signal overvaluation, because swaption volatility is too high*

This explains why Agency MBS spreads look rich in the Libor-OAS space. Generally, OAS valuation metrics attempt to normalize nominal spreads for the level of volatility. With the DVX index 1 standard deviation above its historical average, OAS valuations look 1-2 standard deviation rich across most Wall Street models. However, there are a few caveats regarding OAS metrics. Philosophically, we are not big proponents of this methodology because it requires the user to accept the model specifications of volatility and prepayment assumptions. For example, note the wide range of overall Libor OAS spread levels across Wall Street models or the over/undervalued metric captured in the Z-score in Table 1. Moreover, we believe the marginal buyer of MBS is not OAS driven. The ownership structure of the Agency MBS market has changed dramatically in 2009. Demand has been driven by the Fed/Treasury, domestic banks and real money buyers, while traditional OAS users such as the Government Sponsored Enterprises have taken a back seat.

*Credit is still cheap*

### *Relative Value of Agency MBS vs. other spread sectors*

Corporates and CMBS are still 1-1.5 standard deviations undervalued versus MBS, but in late 2008 they were 3-4 standard deviations cheap. Accordingly, our view is a large portion of that trade is behind us.

Putting it all together, nominal spreads have room to tighten while OAS spreads are rich on a stand-alone or versus competing spread sectors. This makes us slightly positive on Agency MBS vs. Treasuries and Agency securities but biased to overweight credit in the strategies where we can express that view. For reference, our MBS scorecard has been running the value component at neutral over the last 6 weeks as of 11/13/09.

*What happens when the Fed stops buying?*

### **Agency MBS Post the Fed and Treasury purchase programs**

The Fed and to a lesser extent the Treasury purchase programs have undoubtedly been the dominant force in Agency MBS in 2009. As of 11/13/09, year-to-date program purchases total \$1.2T versus \$1.4T in fixed rate gross issuance. In other words, Fed/Treasury sponsored purchases account for 86% of the gross issuance. A key question asked by investors is what happens when the purchase programs end?



*Lower coupons are more vulnerable in the absence of Fed sponsorship*

Table 3 compares the float per coupon in Fannie Mae 30-year MBS vs. sponsored demand. In lower coupons (4% - 5%), the Fed owns almost the entire float. All else being equal, in the absence of Fed sponsorship these coupons are most susceptible to spread widening pressure, but that's only if the Fed starts selling its holdings, which is an unlikely scenario in our view. As the Fed steps back, banks are likely to emerge as the marginal buyer of Agency MBS. As shown in their earnings reports, given that banks are flush with cash and deposits are growing at a solid pace, the risk weightings on Agency MBS securities (20% Fannie/Freddie, 0% GNMA) provide a more efficient deployment of capital vs. corporate bonds, secondary loans and non-agency MBS. In other words, banks are being incentivized by the regulatory structure and the favorable treatment of Agency MBS to increase purchases.

Table 3

FN 30yr Coupon	YTD Gross Issuance (\$B)	Current Balance Outstanding (\$B)	Float Per Coupon (\$B)			Fed/Treasury Ownership (\$B)	% Float Owned by Fed/Treasury		
			No adj	Ex CMO	Ex CMO/Mega		No adj	Ex CMO	Ex CMO/Mega
4.0	116	114	114	105	105	98	86%	93%	93%
4.5	262	297	297	285	257	226	76%	79%	88%
5.0	87	404	404	357	180	147	36%	41%	82%
5.5	35	545	545	457	223	150	28%	33%	67%
6.0	19	371	371	305	171	27	7%	9%	16%
6.5	7	120	120	88	46	3	3%	3%	7%
<b>Total</b>	<b>526</b>	<b>1,851</b>	<b>1,851</b>	<b>1,597</b>	<b>982</b>	<b>651</b>	<b>35%</b>	<b>41%</b>	<b>66%</b>

Source: Bond Hub, as of 11/13/09

*The forward market implies 25-50bps widening potential*

From a valuation perspective, spreads are fair in our opinion so one has to look somewhere else to isolate the Fed dislocation before quantifying potential widening. By purchasing forward TBA's, and then rolling that position, the Fed has in essence created a constant squeeze in front months, which in turn has driven dollar roll financing 25-50bps below where it should be. Assuming that volatility, yield curve and prepayments remain constant, spreads could widen accordingly as roll financing normalizes. However, spread drivers are unlikely to stay unchanged.

Table 4

Fannie Mae 30yr Coupon	4.0	4.5	5.0	5.5
December/January Roll	10 ¼	11+	12	10 7/8
Break Even Carry	9 7/8	11	10+	10
Difference (ticks)	0.375	0.500	1.500	0.875

Source: TradeWeb, as of 11/13/09

*In terms of volatility, we expect the long term impact to be minimal*

*What will happen to volatility?*

On one hand, we demonstrated in Table 1 that volatility has room to normalize based on historical mean reversion. Realized volatility has also been declining recently as mortgage rates remain confined to tight ranges. On the other hand, at these dollar prices Swaption volatility has been highly directional with rates (higher rates = higher volatility). In our view, the best assumption we can make is, absent a Fed purchase program, Swaption volatility may have a short term pop, followed by a continuation of mean-reversion.



**Lower coupons have significant extension risk**

*What will happen to prepayments?*

As housing collapsed over the past two years, prepayment risk has evolved into a credit story in addition to the traditional premise that interest rates have some reasonable impact upon MBS prepayment rates. This has been the case in particular for higher coupons like 6s and 6.5s where FICO/LTV (loan-to-value) impairment has significantly suppressed refinancing access for these borrowers. It is our view housing will remain difficult for many years, which means prepayment risk will be slower than market expectations. We have already seen this year a significant revision by Wall Street firms in regards to their prepayment expectations. This is a positive for higher coupons and a significant risk for lower coupon securities due to extension risk.

**Up-in-coupon remains our theme**

This leads into our views on the coupon stack (i.e. coupon positioning). This year we have been and remain big proponents of the “up-in-coupon” trade, mortgage-speak for being overweight higher coupons (6.0%-6.5%) and underweight lower coupons (4%-5%). If mortgage rates increase as a result of the Fed exiting, the prepayment risk in the higher coupons will be reduced (less incentive for borrowers to refinance) and in our view becomes disastrous for coupons 5% and below. Valuations also favor higher coupons. Table 5 shows that yield per unit of duration remains clearly in favor of coupons 5.5% and above.

Table 5

Fannie Mae 30 year Coupon	Price	Prepayment Rate (CPR)	MBS Yield	Duration	Equivalent Treasury Yield	Spread (MBS-Treasury)	Spread/Duration
4.0	99-08	2	4.08%	4.98	2.43%	165	33
4.5	101-24	5	4.29%	3.79	1.84%	245	65
5.0	104-06	17/23	3.87%	2.90	1.35%	252	87
5.5	105-22	23/25	3.58%	2.14	0.95%	263	123
6.0	106-17	25/30	3.50%	1.57	0.61%	289	184
6.5	107-14	30/35/40	3.00%	1.17	0.44%	256	219

Prices and durations as of 11/13/09  
 Yield Calculations based on probability of each CPR scenario  
 Treasury benchmarks selected to match MBS duration  
 Source: Bloomberg, IDC

**Bottom Line:** Agency MBS are not over-valued. The Fed/Treasury purchase programs have indeed dominated the market this year in particular in the lower coupons. However, we do not fear an immediate liquidation and we see satisfactory demand being realized by other market participants. We remain up-in-coupon and overweight Agency MBS.



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Ion began his career in the financial services industry in 2000, joining Macquarie Allegiance Capital in 2001. Prior to his association with Macquarie Allegiance, Ion was a junior options trader for PCX market maker. He holds a dual degree in Business and Economics from the University of California, Berkeley.

Ion has been instrumental in developing and implementing a detailed proprietary framework for managing MBS risk. He is responsible for formulating strategic views, as well as capturing trading opportunities centric to Agency MBS.



## Glossary of key terms

*Agency Mortgage Backed Securities (MBS)* – structured debt securities issued by a government agency such as Ginnie Mae (GNMA) or Government Sponsored Enterprises such as Fannie Mae (FNMA) or Freddie Mac (FHLMC). These securities are backed by mortgage loans and guaranteed by the agencies, which have an explicit government AAA rating in the case of GNMA and an implicit government guarantee AAA rating in the case of FNMA and FHLMC. The Agency MBS market is one of the world's largest and most liquid bond markets with over \$5 trillion outstanding.

*Agency TBA's ("To-Be-Announced)* – the TBA market is a forward delivery market with participants entering into forward contracts to buy or sell Agency MBS on a monthly settlement schedule set by the Bond Market Association. Settlement dates are usually 30 days forward but can also be 60 days or 90 days. The "Front month" represents the current settlement month, while the "Back months" represent settlement months following the front month.

*Current Coupon (CC)* – also known as par coupon is calculated through price interpolation between two TBA coupons bracketing par (\$100). The formula for linear interpolation is  $\text{Current Coupon} = \text{Coupon below par} + (100 - \text{Coupon below par}) / (\text{Coupon above par} - \text{Coupon below par}) * 0.5$ . MTGEFNCL <Index> on Bloomberg provides a live quote for this calculation.

*Prepayment Risk* – the standard conforming mortgage allows the homeowner to prepay the principal in full or in part without penalty at any time over the term of the loan. An Agency MBS investor is long a bullet like security and short call options to the borrower, which makes the effective maturity variable due to market conditions. Prepayment risk can be broken into the following categories: turnover (natural level of prepayments that occur when a home is sold); curtailments (extra payments of principal by borrowers who want to build equity in their homes faster); refinancing (borrowers replacing old loan with a new loan at a lower rate); involuntary (FNMA/FHLMC will purchase a loan out of an MBS pool if the loan was successfully modified under the U.S. Treasury's Home Affordability and Stability Plan or a loan defaults and enters foreclosure). Generally, the level of refinancing activity is dependent on the direction of interest rates (higher/lower at lower/higher interest rates). A characteristic of Agency MBS is their negative convexity – principal being returned sooner than expected in a declining interest rate environment, and later than expected in a rising interest rate environment.

*DVX (USD Vega Index)* – a Deutsche Bank index representing implied swaption volatility measured in annualized basis points. The calculation is based on a sample of European swaptions, each with a weighting representing liquidity and trading volume, as determined by Deutsche Bank. The minimum expiry of any option represented in the index is 1 year.

*CPR (Constant Prepayment Rate)* – the percentage of outstanding mortgage loan principal that prepays in one year, based on an annualized Single Monthly Mortality (SMM), which reflects the outstanding mortgage loan principal that prepays in one month.

*HPA (Home Price Appreciation)* – rate of housing price appreciation, measured nationally based on FHFA US House Price Index and S&P Case-Shiller.

*TBA Dollar Rolls* – duration neutral TBA centric financing transaction, consisting of two simultaneous buy and sell orders for the same TBA security for different settlements. Roll seller will sell front month and buy back month; while roll buyer will buy front month and sell back month. The forward price (back month) is usually lower than the "closer" price (front month) to compensate for carry.



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