26 September 2013 │ 22 pages
North America

Mortgage Credit Weekly

Fannie Markets Risk Sharing Deal

- **Muted Reaction to FOMC** — Prices remained unchanged across all non-agency sectors for the week ending September 25, 2013. There seemed to be a flurry of activity immediately after the FOMC announcement, but it did not materialize into higher prices. We maintain our positive stance on non-agency mortgage credit.

- **Fannie Markets Risk Sharing Deal** — Fannie Mae began marketing its first risk sharing transaction, the basic structure and the collateral is very similar to Freddie Mac's STACR deal. The notable differences are the expected BBB- rating on the M-1 tranche, the removal of the cumulative default trigger and the lower loss severity scale on the lower cumulative defaults.

- **Fannie Retaining More Risk, Expect Tighter Pricing** — The expected rating on the M1 class will add to the potential pool of investors. Removal of the cumulative default trigger will allow for more cash flow to the securities later in the life of the deal. Investors may now begin to see this as more programmatic issuance with more transparent pricing.

- **Case Shiller July HPA Less Positive** — July Case-Shiller Composite-20 City HPA was +7.7%, in line with our expectation and consensus of +10%.We continue to expect home prices to be up 13% in 2013 and 4% in 2014.

- **Housing Affordability Trending Lower** — Given the home price data published this week, we thought it would be a good opportunity to review housing affordability. A couple of affordability metrics, mortgage payment to income and mortgage payment to rent, show that California is one of the least affordable among major states.

- **NAIC Updates Macro Assumptions** — The home price appreciation assumptions proposed are more positive than last year and the scenario weightings did not change, which should result in generally lower capital charges.

- **Bank to Non-Bank Transfers: Small Pickup in Long-Term Value** — We find that the long-term valuation impact of a bank to non-bank transfer is positive, but only slightly so. Overall, we hold the opinion that there should be at least some yield pickup demanded by the market, as the change in servicing creates uncertainty in the future cash flow projections, and investors should be paid for that uncertainty.

- **ABX Remittance Update** — Serious delinquencies continued to fall in September, and the pace of improvement seems to have increased for 06-1, 07-1 and 07-2. CDRs decreased for ABX 06-2 but increased for the other indices. Liquidation loss severities were also mixed – decreasing for 07-1 but increasing for the other indices.

Roger Ashworth
+1-212-723-3183
roger.ashworth@citi.com

Raja Narayanan
+1-212-723-1539
raja1.narayanan@citi.com

Xing Wei
+1-212-723-1513
xing.wei@citi.com

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

Contents

Muted Reaction to FOMC

We maintain our positive stance on non-agency mortgage credit.

Prices remained unchanged across all non-agency sectors for the week ending September 25, 2013. BWIC supply increased by $240MN from last week to $3.4BN. There seemed to be a flurry of activity immediately after the FOMC announcement, but it did not materialize into higher prices. We have not seen a pickup in customer interest in fixed rate bonds despite the fact that the Fed decided to hold back on tapering. We maintain our positive stance on non-agency mortgage credit. Fast money accounts continue to be sellers.

Fannie Mae Markets Risk Sharing Deal

Basic structure and collateral is similar to the Freddie transaction.

Earlier this week Fannie Mae began marketing its first risk sharing transaction (Connecticut Avenue Securities 2013-C01, or CAS 2013-C01) for this year, in accordance with their 2013 goals as established by the FHFA. The basic structure is substantially the same as Freddie Mac's STACR 2013-DN1 transaction, with some subtle structural changes. We discussed Freddie's transaction in our Mortgage Credit Weekly dated July 26, 2013 (click here for a copy). Broadly speaking, the transaction will also be general obligations of Fannie and bond cash flows will be based on a reference pool of certificates. The collateral is very similar to the Freddie transaction.

Fannie currently plans to retain around 12% of each M1/M2 classes.

Like Freddie, Fannie will retain the first 30bps of loss, and will offer two subordinate certificates covering losses from 30bps to 300bps. Fannie is currently offering $675 million of certificates, evenly split between the M1 and M2 subordinate tranches, with the same sequential payment structure (first M1 then M2) as seen in the STACR transaction. Fannie currently plans to retain around 12% of each M1/M2 classes. Like Freddie, these notes are 10 year obligations and will be uncapped floating rate bonds. Figure 1 highlights the basic structure.

Figure 1. CAS 2013-C01 Risk Sharing Deal, Similar to Freddie STACR Transaction

				At a 10CPR:				
Class	Notional Amount	Credit Enhancement	Expected Fitch Rating	WAL (Yrs)	Window (Months)	Spread	Price	Maturity
A-H	27,212,911,480	3.00%						
M-1	337,500,000	1.65%	[BBB-]	2.18	1-57	1mL+[ ]	100-00	Oct-23
M-1H	41,236,856	1.65%						
M-2	337,500,000	0.30%	N/A	8.20	57-120	1mL+[ ]	100-00	Oct-23
M-2H	41,236,856	0.30%						
B-H	84,163,746	0.00%						
Total	28,054,548,938							

Source: Fannie Mae, Citi Research

Subtle Structure Changes, Expected M1 BBB- Rating

The first very notable change is that there is an expected BBB- rating from Fitch. This should add to the potential investor base, as there are still many buyers who require a rating, and will likely bode well for pricing.

The second notable change is in the cash flow triggers. The STACR deal contained two triggers which cut off **unscheduled** principal payments to the subordinate classes, one of which was a cumulative default trigger and the other was a minimum senior credit enhancement trigger. In the Fannie CAS transaction, the cumulative default trigger was **not** included but the 3% minimum credit

Figure 2. Lower Severity = Higher Attach Pt

	STACR 13-DN1	CAS 2013-C01
Cumulative Net Credit Event Percent ("Cum Defaults")	Loss Severity (%)	Loss Severity (%)
≤ 1%	15	10
1 - 2%	25	20
> 2%	40	40

Source: Fannie Mae, Freddie Mac, Citi Research

enhancement trigger remains. Overall, the removal of the cumulative default trigger allows for the offered bonds to receive more unscheduled principal later in the life of the transaction, especially if prepayments de-lever the structure even with higher total defaults toward the end of the transaction life.

Cumulative default trigger was not included and the loss severity scale is lower for lower cumulative defaults.

The third change of note was the loss severity scale applied when loans are removed from the reference pool due to a credit event (180 days delinquent, deed-in-lieu/short sale, REO acquisition, etc.). Figure 2 highlights that the loss severity scale is lower in the earlier defaults. Generally speaking, this will provide for higher attachment points as more overall defaults/credit events would be needed for the offered certificates to take a loss. This increased protection of loss should give investors more comfort in the securities, especially with the more subordinate M2 class since these lower loss severity figures are only lower in the lower cum default range.

Fannie Retaining More Risk, Expect Tighter Pricing

We hold the view that these certificates will be priced to a tighter spread relative to the STACR transaction for several reasons:

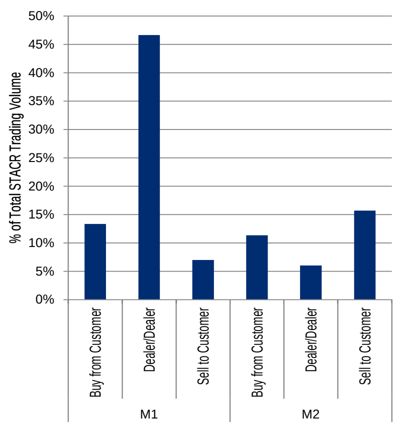
1. According to FINRA data, the STACR 2013-DN1 M1 is trading around a dollar price of $101 and the M2 is trading around $105 (although most trading volume has been dealer-to-dealer transactions in the M1 as seen in Figure 3).

2. There is an expected rating on the M1 class, which should add to the potential pool of investors.

3. Removal of the cumulative default trigger will allow for more cash flow to the securities later in the life of the deal. Fannie is, in effect, retaining more credit risk relative to Freddie.

4. This is the second transaction with a substantially similar structure, investors may now begin to see this as more programmatic issuance with more transparent pricing.

Figure 3. STACR Trading Volume



Source: FINRA, Citi Research

Countrywide Settlement Back Into Recess

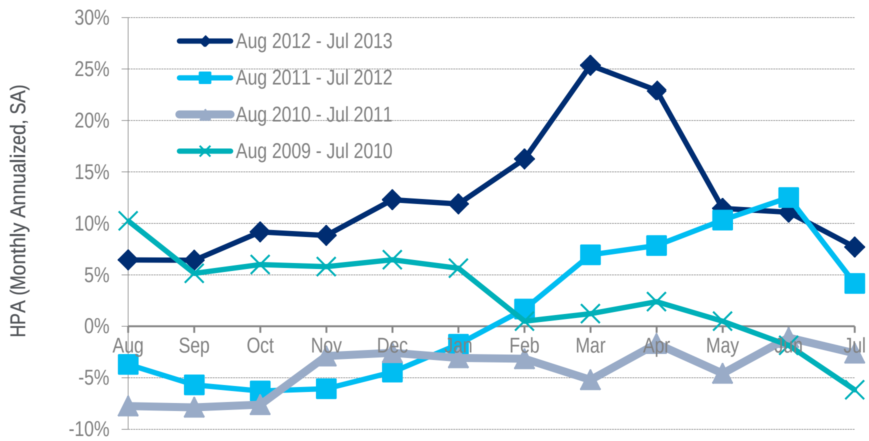
We expect cash flows to flow through to deals by mid-2014 at the earliest.

The $8.5 billion settlement hearing for Bank of America/Countrywide went back into recess yesterday, and hearings will resume in mid-November. Only one witness for the objectors is left, and then there will be several days of closing arguments. It is unclear to us how long it will take the judge to render a decision, and whether or not the objectors to the settlement will file an appeal at that point. We do know, however, that once the decision is finalized BofA/Countrywide has 120 days to make payments to the covered trusts. Taking these factors into account, we expect cash flows to flow through to deals by mid-2014 at the earliest.

Case-Shiller July HPA Less Positive

July Case-Shiller Composite-20 City HPA was +7.7% (monthly, annualized, seasonally adjusted, Figure 4), in line with our expectation and consensus of +10%. Although July HPA is the lowest level we have seen this year, it is higher than 2012 July HPA of 4.2%. July HPI is up +12.4% YoY compared to 12% in the past three months. **We continue to expect home prices to be up 13% in 2013 and 4% in 2014**.

Figure 4. Month-over-month Change in HPA Much Lower Than Previous 2 Months



Notes: Case Shiller Composite 20-Citiy HPA data (SA monthly, annualized) by year

Source: S&P Case-Shiller, Citi Research

Highest HPA in Las Vegas, California HPA Less Strong

Las Vegas had the highest July HPA, up 34.8% (monthly, annualized, seasonally adjusted). Although still outperforming U.S., metropolitan areas in California (Los Angeles, San Diego and San Francisco) showed less positive HPA in July. We expect California outperformance will continue to deteriorate (Figure 5).

The inventory drops in Atlanta, Phoenix and Miami have moderated the most suggesting that the high HPA in these areas should come down. On the other hand, Boston inventory is down significantly YoY, suggesting that HPA will likely improve in the coming months.

Figure 5. HPA Summary by MSA

	Phoenix	Los Angeles	San Diego	San Francisco	Miami	Tampa	Atlanta	Chicago	Boston	Detroit	Las Vegas	New York	Seattle	Composite-20
Peak to Current	-39.5%	-25.4%	-26.0%	-21.4%	-40.1%	-38.1%	-21.3%	-29.1%	-10.1%	-30.5%	-48.9%	-22.4%	-18.1%	-23.0%
12M	18.9%	20.8%	20.4%	24.8%	13.7%	12.5%	18.4%	7.6%	6.2%	16.8%	27.5%	3.4%	12.4%	12.3%
6M Annualized	16.8%	25.5%	26.7%	30.6%	18.9%	15.7%	16.0%	14.6%	8.8%	18.6%	34.2%	6.3%	16.6%	15.6%
3M Annualized	12.3%	19.1%	27.7%	22.4%	14.0%	11.7%	12.3%	9.4%	0.1%	11.5%	34.8%	4.8%	15.4%	10.1%
Dec-12	21.4%	25.7%	13.0%	21.5%	11.5%	11.9%	5.3%	7.3%	6.7%	17.7%	28.4%	2.4%	9.3%	12.3%
Jan-13	26.8%	20.0%	5.8%	27.6%	15.4%	25.7%	31.0%	8.4%	7.4%	14.6%	23.3%	3.5%	13.9%	11.9%
Feb-13	24.4%	23.9%	11.0%	32.4%	13.0%	18.0%	13.3%	13.7%	14.9%	3.9%	25.5%	10.2%	5.7%	16.3%
Mar-13	23.4%	34.0%	30.5%	49.1%	25.7%	32.3%	22.0%	25.9%	23.7%	57.9%	44.8%	2.9%	34.8%	25.4%
Apr-13	16.8%	39.5%	37.1%	36.9%	34.5%	10.4%	24.5%	20.9%	16.0%	22.3%	31.0%	10.4%	15.1%	22.9%
May-13	13.3%	17.6%	34.4%	26.7%	20.4%	8.7%	13.3%	16.6%	0.5%	28.4%	37.8%	6.5%	18.6%	11.4%
Jun-13	11.8%	20.5%	29.2%	24.5%	15.4%	11.6%	11.3%	-0.2%	-0.4%	1.1%	31.9%	6.3%	11.5%	11.1%
Jul-13	11.7%	19.1%	19.9%	16.3%	6.6%	15.1%	12.4%	12.5%	0.2%	6.7%	34.8%	1.5%	16.1%	7.7%
Jan-Dec Chg	5.3%	-5.7%	-7.2%	6.1%	4.0%	13.8%	25.6%	1.1%	0.7%	-3.2%	-5.1%	1.1%	4.6%	-0.4%
Feb-Jan Chg	-2.4%	3.9%	5.2%	4.8%	-2.5%	-7.7%	-17.7%	5.3%	7.4%	-10.7%	2.2%	6.7%	-8.2%	4.4%
Mar-Feb Chg	-0.9%	10.1%	19.5%	16.7%	12.7%	14.3%	8.7%	12.2%	8.8%	54.0%	19.2%	-7.4%	29.1%	9.1%
Apr-Mar Chg	-6.7%	5.5%	6.6%	-12.2%	8.8%	-21.9%	2.4%	-5.0%	-7.7%	-35.6%	-13.7%	7.5%	-19.8%	-2.4%
May-Apr Chg	-3.5%	-21.9%	-2.7%	-10.2%	-14.1%	-1.7%	-11.1%	-4.3%	-15.5%	6.1%	6.8%	-3.8%	3.6%	-11.5%
Jun-May Chg	-1.5%	2.9%	-5.2%	-2.3%	-5.0%	2.9%	-2.0%	-16.8%	-0.9%	-27.3%	-5.9%	-0.3%	-7.2%	-0.4%
Jul-Jun Chg	0.0%	-1.4%	-9.4%	-8.2%	-8.8%	3.5%	1.1%	12.7%	0.6%	5.6%	2.9%	-4.8%	4.6%	-3.4%

Note: All HPA figures are annualized, seasonally adjusted

Source: S&P Case-Shiller, Citi Research

Housing Affordability Trending Lower

Given the home price data published this week, we thought it would be a good exercise to review housing affordability, and focus on particular states of interest in relation to the United States as a whole. In this section, we calculate affordability ratios in two ways: 1) annual mortgage payment as a percentage of income; and 2) monthly mortgage payment as a percentage of rent.

Mortgage Payment / Income

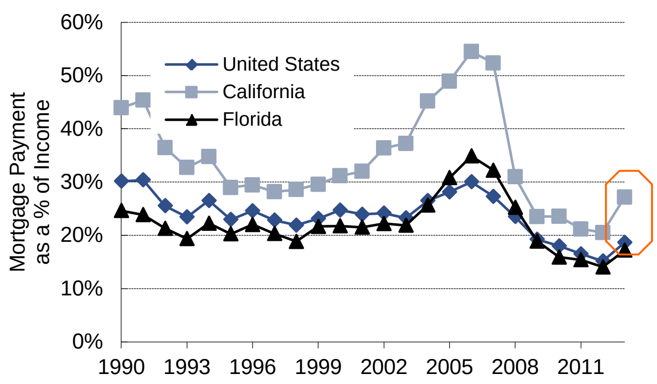
Using the Core Logic Single Family Detached Median Home Price and Freddie Mac's Weekly Primary Mortgage Market Survey Rate, we calculate the monthly payment of a 30-yr fixed rate mortgage on a typical house in any state by assuming a 20% down payment. Moody's income data is only updated through year-end 2010. We extrapolated 2011, 2012 and 2013 income numbers with the GDP growth in each state.

The affordability ratio is calculated as a simple division of mortgage payment by income. Since factors such as tax and maintenance (which also varies by state) are not considered here, comparison of absolute levels among states is inevitably inaccurate. However, when we compare the current affordability ratio of a state with its historical ratios, it gives us an idea of how affordability is trending and whether owning a home is currently affordable compared to historical standards, in a given state.

CA affordability has deteriorated faster than the U.S. and Florida due to recent super-high CA HPA.

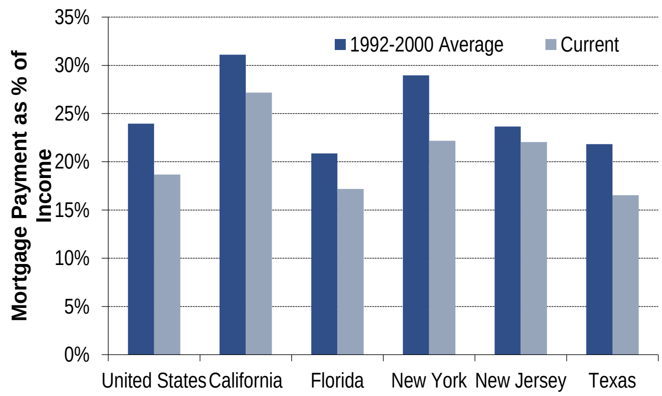
Figure 6 shows the affordability ratios for Florida, California and U.S. The red circle in the figure highlights that CA affordability has deteriorated faster than the U.S. and Florida due to recent super-high CA HPA. This can also be confirmed by the further analysis shown in Figure 7.

Figure 6. CA Affordability Has Deteriorated Faster



Source: Moody's Analytics, CoreLogic, US Census, Freddie Mac, Citi Research

Figure 7. CA and NJ Affordability Closest To Equilibrium



Source: Citi Research

California and New Jersey affordability are close to reaching equilibrium.

In this analysis, we want to estimate what the HPA would be if the affordability of a state were to reach equilibrium (equilibrium is defined by the average ratio from 1992 to 2000, a period where the affordability ratios stayed relatively flat). Figure 7 shows the affordability ratio of the US and major states in equilibrium and current levels. Again, we can observe that California and New Jersey affordability are close to reaching equilibrium.

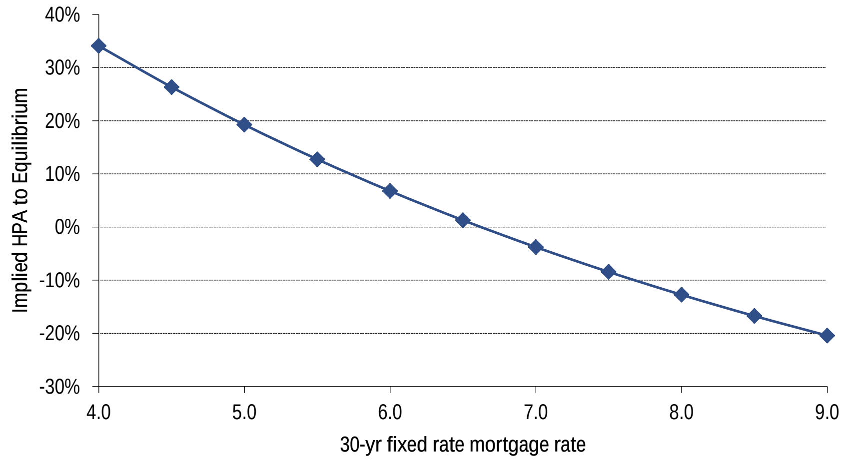
Figure 8. Implied HPAs to Equilibrium Under Different Rate Scenarios

State	Mortgage Rate		
	4.50%	5.0%	5.50%
United States	26%	19%	13%
California	13%	6%	1%
Florida	20%	13%	7%
New York	29%	21%	15%
New Jersey	6%	0%	-6%
Texas	30%	23%	16%

Source: Citi Research, Source: Moody's Analytics, CoreLogic, US Census, Freddie Mac

With a small twist in this analysis, we can also show the potential impact mortgage rates have on HPA. If we fix the affordability ratio and vary only the 30-yr mortgage rate, a plot in Figure 9 shows the relationship between mortgage rates and projected HPAs to reach equilibrium. Although affordability ratios often change and hence the projected HPA level can easily move, it is interesting to see how much the HPA expectation would change if rates move. For example, if the 30 year mortgage rate were to increase from 4.5% (close to current levels) to 5.5%, the expected HPA to equilibrium would drop by 14%. And the impact gradually decreases as the rate increase further. Figure 8 shows the expected long-term HPA under a number of rate scenarios across major states.

Figure 9. Estimated Mortgage Rates Impact on HPA

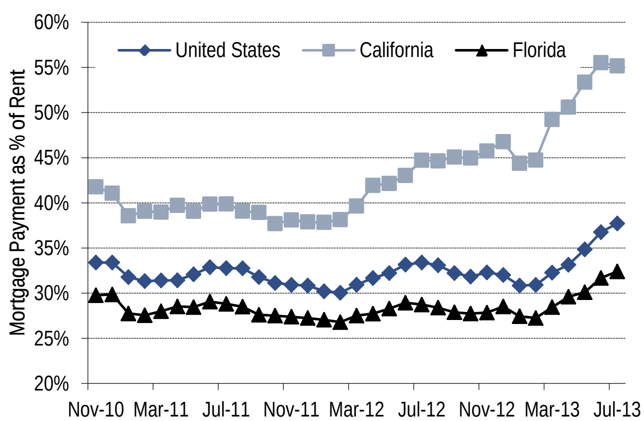


Source: Moody's Analytics, CoreLogic, US Census, Freddie Mac, Citi Research

Mortgage Payment / Rent and Rental Yield

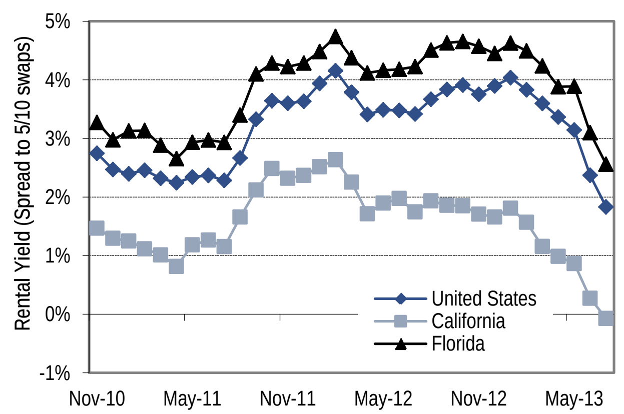
We can measure the affordability with another metric – mortgage payment as a percentage of rent, using Zillow's single-family rent data. A higher percentage would indicate it's less affordable to buy a home compared to renting a home. Again, the absolute levels of this affordability ratio may be inaccurate, but its change can provide us with some useful information. For example, Figure 10 shows that CA affordability has been deteriorating faster than Florida and U.S. in the past two years, because CA HPA has been outpacing the increase in rent by a larger margin.

Figure 10. CA Affordability Deteriorated Fastest



Source: Moody's Analytics, CoreLogic, Zillow, Freddie Mac, Citi Research

Figure 11. CA Rental Yield Spreads Also Lowest



Source: Moody's Analytics, CoreLogic, Zillow, Freddie Mac, Bloomberg, Citi Research

We also attempted to estimate the rental yields for single-family homes in CA, FL and US with the following assumptions:

- The investor would purchase the property with cash.
- Rent payment wouldn't be collected when the property is vacant (vacancy rate from census).
- 2.5% of the rent income would be used towards maintenance of the property.

- The rental yield is calculated as a spread of the rental return over the average of 5y and 10yr swap rate.

Figure 11 shows that CA unsurprisingly has the lowest rental yield at close to 0%, which means renting out a single-family home in CA would generate the same return as a risky free asset does. In other words, buying a home does not look attractive compared to renting in CA.

NAIC Publishes New Macro Assumptions

We view the proposed HPA assumptions as positive for insurance company RMBS capital charges going into next year.

The National Association of Insurance Commissioners (NAIC) recently published their proposed economic assumptions to be used in their year-end analysis of non-agency RMBS and CMBS. As a reminder, the NAIC establishes economic scenarios for default model inputs in order to calculate the present value of expected bond losses across a range of scenarios. The weighted average expected loss is then used to calculate capital charge levels for various carrying prices on insurance portfolios. Figure 12 highlights this year's proposed year-end assumptions. Overall, these HPA assumptions are more positive than last year and the scenario weightings did not change, so we view these proposed values as positive for insurance company RMBS capital charges going into next year.

Figure 12. Proposed NAIC Macro Assumptions, More Positive on HPA

2013 RMBS Scenarios	Probability Weighting	Current to Trough	3-year HPA Growth	5-year HPA Growth
Most Optimistic	0%	NA	44%	77%
Optimistic	10%	NA	29%	46%
Baseline	50%	NA	15%	21%
Conservative	25%	-2%	2%	0%
Most Conservative	15%	-29%	-7%	-17%

Source: NAIC

Bank to Non-Bank Servicing Transfers: Small Pickup in Long-Term Value

Securities associated with a transfer have historically underperformed in the immediate months after a transfer.

In last week's Mortgage Credit Weekly, we took a closer look at mortgage servicing transfers from bank to non-bank entities. In the article, we highlighted some of the general trends associated with these transactions such as lower short-term liquidation rates, lower loss severities, lower advance rates of delinquent payments, higher modification rates, and more reduction of principal on modification. We also noted that, on a price basis, securities associated with a bank to non-bank servicing transfer have historically underperformed in the immediate months after a transfer.

We find that the long-term valuation impact of a transfer is positive, but only slightly so.

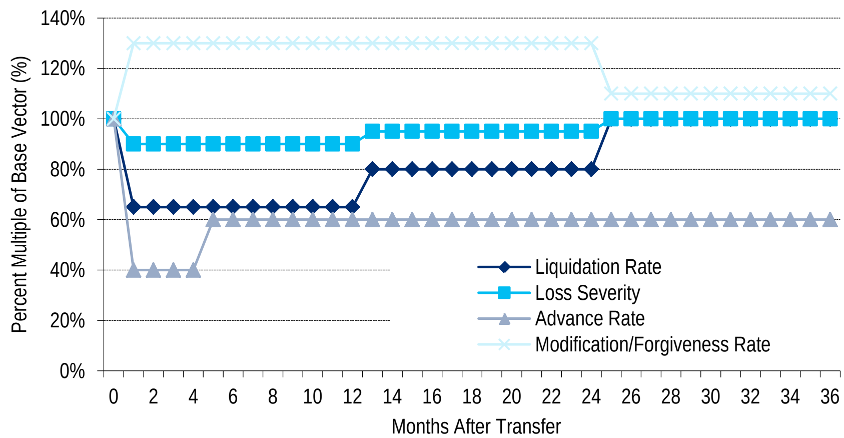
We generally expect some underperformance, as the transfer process and subsequent non-bank servicer actions have historically generated cash flow disruptions from the previously mentioned dynamics above. In this article, we establish some cash flow projection assumptions based on our observations of previous transfers, and examine the effect of these assumptions on bank-serviced securities' cash flows. We ultimately find that the long-term valuation impact of a bank to non-bank transfer is positive, but only slightly so.

Assumptions Used to Mimic a Transfer

We started off by selecting a subset of a little more than 1,000 subprime securities that have always been serviced by bank entities and used our default model to project cash flows as a baseline. We then adjusted the previously mentioned

metrics by scaling each bond-specific set of rate vectors according to Figure 13. The chart highlights how we adjusted each vector, as a percent of the original rate, over time. As seen in the exhibit, advance rates fall, modifications and principal forgiveness rise, liquidations fall, loss severities fall, and we have most vectors revert to the mean after two years with the exception of advance rates and modification rates.

Figure 13. Simplified Assumptions for A Servicing Transfer



Source: Citi Research

Small Yield Pickup, Depends on Dollar Price

The largest pickup in yield appears in the $60-75 dollar price securities.

Figure 14 summarizes the yield results for our back of the envelope analysis for a subprime bank to non-bank servicing transfer. Overall, we estimate the yield pick-up for a servicing transfer is ~13bps. This is not a uniform distribution across securities, however. The largest pickup in yield appears in the $60-75 dollar price securities with a 32 bps pickup in yield from 5.60% to 5.73% for our assumptions. Both very high (>$90) and low (<$40) priced securities show little pickup in yield, which makes some sense to us.

The high dollar priced securities are likely projected to take very little if any losses, and are mostly front sequential securities which will only experience some average life extension as a result of the transfer. The low-priced bonds, on the other hand, exhibit a small yield drop as a result of the transfer, as these are the bonds more likely to absorb any near-term losses as a result of the transfer.

Change in servicing creates uncertainty in cash flow projections, and there should be at least some yield pick-up demanded by the market.

Generally speaking, it appears there is value added by a servicing transfer, but it is not a significant amount and arguably within margin of error. Overall, we hold the opinion that there should be at least some yield pickup demanded by the market, as the change in servicing creates uncertainty in the future cash flow projections, and investors should be paid for that uncertainty. We will continue to refine our analysis and assumptions, but right now servicing transfers don't appear to add all that much value over the long run.

Figure 14. Small Yield Pick-Up As A Result of Transfer, Price Dependent

Bond Price Range ($)	Base Vector	Servicing Transfer Vector	Yield Pickup
<40	8.46	8.40	-0.06
40-60	7.07	7.08	0.01
60-75	5.92	6.23	0.32
75-90	4.93	5.16	0.24
>=90	3.69	3.71	0.02
Grand Total	5.60	5.73	0.13

Source: CoreLogic, Intex, IDC, Citi Research

ABX Remittance Update

Serious delinquencies continued to fall in September, and the pace of improvement seems to have increased for 06-1, 07-1, and 07-2. The decline in serious delinquencies for ABX 06-1 was primarily due to a large decline in the D90+ bucket for MLMI 2005-AR1.

CDRs were mixed, decreasing for ABX 06-2 but increasing for the other indices. This is a reversal from the downward trend in CDRs that has persisted, reflecting continued slowdowns in the foreclosure pipeline. Liquidation loss severities were also mixed – decreasing for 07-1 but increasing for the other indices.

Figure 15. Pace Of Improvement in Delinquencies Increases in September

Sep-13

				Default		Delinquencies							
Index	WALA	Factor	CPR	CDR	LS	D30	D60	D90+	FCLR	BK	REO	D60++	Mod Loss
ABX 06-1	95	0.15	11.67	7.39	76.8	3.96	1.43	10.00	13.85	5.37	1.94	32.59	0.24%
ABX 06-2	90	0.20	10.53	6.28	84.0	4.18	1.70	10.56	16.20	4.89	2.40	35.74	0.45%
ABX 07-1	83	0.32	12.19	7.23	75.6	3.84	1.75	10.96	17.82	4.86	2.39	37.78	0.37%
ABX 07-2	78	0.39	9.58	6.10	67.6	4.48	1.68	10.83	17.73	4.91	2.21	37.35	0.28%

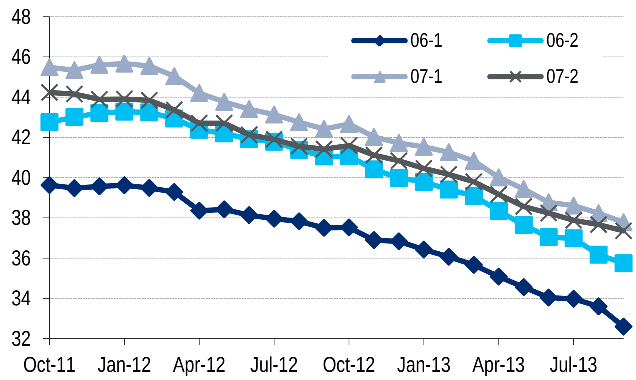
Aug-13

				Default		Delinquencies							
Index	WALA	Factor	CPR	CDR	LS	D30	D60	D90+	FCLR	BK	REO	D60++	Mod Loss
ABX 06-1	94	0.15	10.86	7.10	68.1	3.93	1.51	10.85	13.34	4.95	2.94	33.60	0.24%
ABX 06-2	89	0.20	12.12	8.09	72.9	4.17	1.75	11.76	15.69	4.71	2.25	36.17	0.33%
ABX 07-1	82	0.29	10.94	6.85	83.9	3.99	1.55	11.19	18.27	4.91	2.31	38.23	0.28%
ABX 07-2	77	0.36	10.18	6.08	64.9	4.43	1.67	12.05	16.81	4.61	2.53	37.66	0.32%

Note: All delinquencies are reported in OTS convention. D60++ is 60+ day delinquency including Foreclosure, Bankruptcy and REO

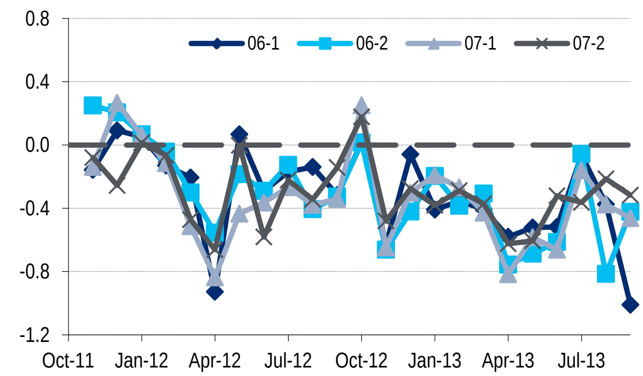
Source: Servicer Remittance Reports, Citi Research

Figure 16. Serious Delinquencies (D60++)



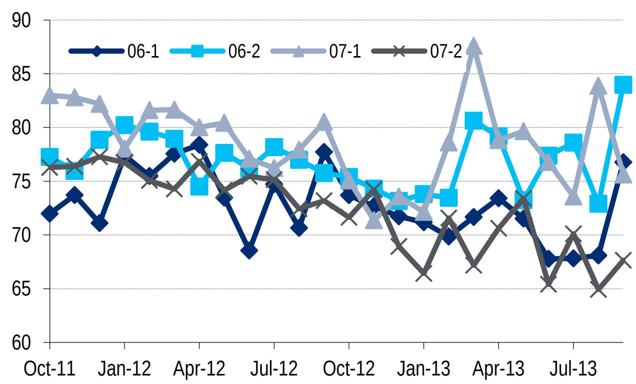
Source: Servicer Remittance Reports, Citi Research

Figure 17. Change in Serious Delinquencies



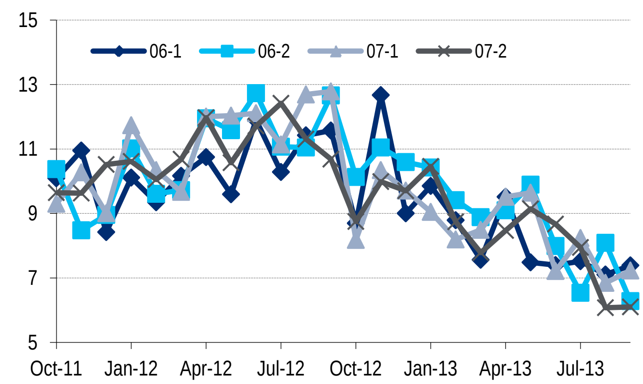
Source: Servicer Remittance Reports, Citi Research

Figure 18. Loss Severities



Source: Servicer Remittance Reports, Citi Research

Figure 19. CDRs



Source: Servicer Remittance Reports, Citi Research

PrimeX Remittance Update

Voluntary CPRs (VPR) declined across all indices except Prime ARM.1, which remained stubbornly high. VPRs declined by about 7.3 points for FRM.2, owing to the selloff in rates in July. This is in line with our earlier expectations of drop in VPRs by 6-8 VPR for the prime sector[1]. RFMSI 2006-SA3 saw a negative VPR due to recapture of previously advanced P&I payments.

CDRs also decreased across all the indices except Prime ARM.1.Serious delinquencies continued to decline for all indices except FRM.1. Severities were mixed – declining for the ARM indices and FRM.2 but increasing for FRM.1. RFMSI 2007-S5 and JPMMT 2006-S4 saw high loss severities primarily due to low loan balance liquidations.

[1] See “How will the rate selloff affect fixed rate prepayments?”, July 18, 2013

Figure 20. Index Performance Summary

Sep-13

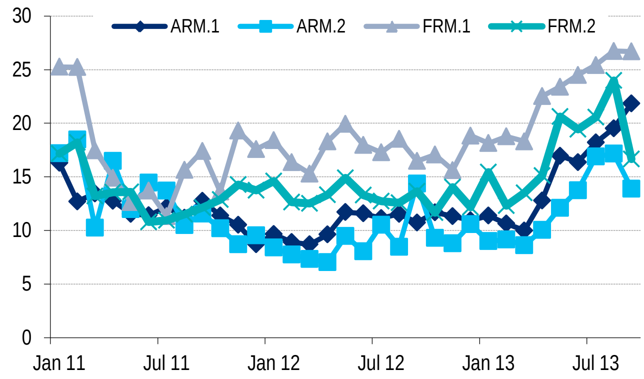
			Default		Delinquencies						
Index	Factor	VPR	CDR	LS	D30	D60	D90+	FCLR	REO	BK	D60++
Prime ARM.1	0.27	21.85	3.38	39.75	1.94	0.88	2.23	3.92	0.64	2.16	9.83
Prime ARM.2	0.28	13.91	4.51	47.06	2.13	1.01	2.42	6.00	0.83	3.13	13.38
Prime FRM.1	0.27	26.69	2.92	43.80	1.65	0.73	2.61	3.89	0.48	2.52	10.23
Prime FRM.2	0.28	16.67	4.43	66.83	2.62	1.20	2.82	8.01	0.80	2.50	15.32

Aug-13

			Default		Delinquencies						
Index	Factor	VPR	CDR	LS	D30	D60	D90+	FCLR	REO	BK	D60++
Prime ARM.1	0.27	19.53	2.72	48.02	2.10	0.86	2.29	4.08	0.55	2.15	9.92
Prime ARM.2	0.28	17.16	5.64	57.88	2.36	0.89	2.52	6.27	0.81	3.07	13.56
Prime FRM.1	0.28	26.74	2.97	40.73	1.99	0.70	2.84	3.84	0.43	2.35	10.17
Prime FRM.2	0.29	24.00	5.38	71.62	2.38	1.35	2.70	8.22	0.85	2.49	15.61

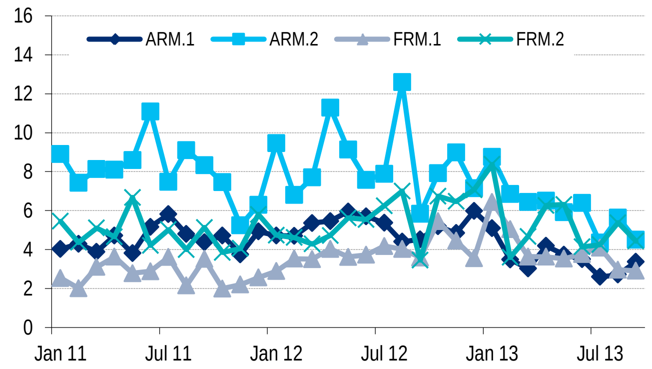
Source: Servicer Remittance Reports, Citi Research

Figure 21. Voluntary Prepays (VPRs)



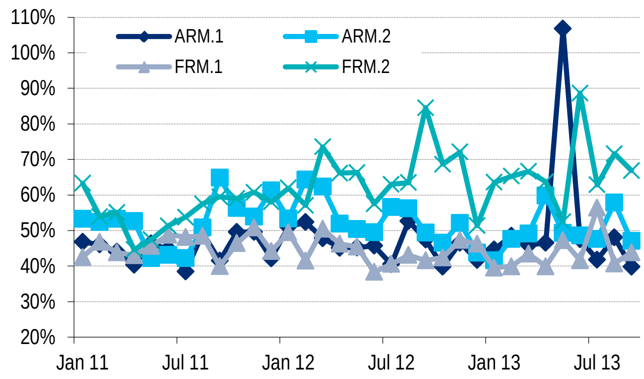
Source: Servicer Remittance Reports, Citi Research

Figure 22. CDRs



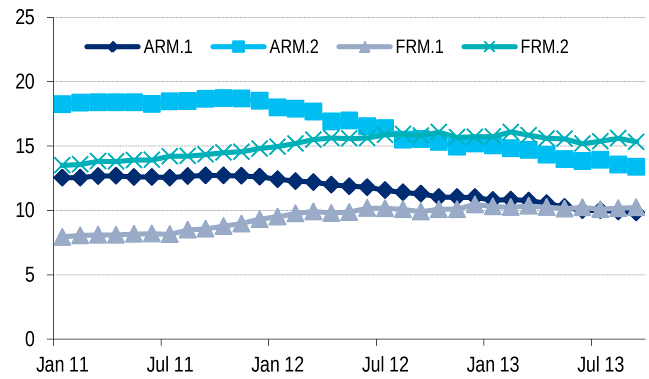
Source: Servicer Remittance Reports, Citi Research

Figure 23. Loss Severities



Source: Servicer Remittance Reports, Citi Research

Figure 24. Serious Delinquencies (D60++)



Source: Servicer Remittance Reports, Citi Research

Market Snapshot

Figure 25. Cash Price Snapshot

Product	Vintage	Tranche	Now	Last Week	Change	Last Month	Change	Jan-13	Change	YTM
Prime	2005	P/T	M90	M90	0.0	M90	0.5	H90	(1.0)	5.00%
		SuperSenior	M/H90	M/H90	0.0	M/H90	0.5	100A	(1.0)	5.00%
	2006	P/T	L/M90	L/M90	0.0	L/M90	0.5	M/H90	(1.0)	5.00%
		SuperSenior	M90	M90	0.0	M90	0.5	H90	(1.0)	5.00%
	2007	P/T	L90	L90	0.0	L90	0.5	M90	(1.0)	5.00%
		SuperSenior	L90	L90	0.0	L90	0.5	M/H90	(1.0)	5.00%
Alt-A	2005	P/T	L/M80	L/M80	0.0	L/M80	0.5	M80	(1.5)	5.50%
		SuperSenior	M/H80	M/H80	0.0	M/H80	0.5	M80	(1.5)	5.50%
	2006	P/T	M/H70	M/H70	0.0	M/H70	0.5	H70	(1.5)	5.50%
		SuperSenior	H70	H70	0.0	H70	0.5	H70	(1.5)	5.50%
	2007	P/T	M/H50	M/H50	0.0	M/H50	0.5	H50	(1.5)	5.50%
		SuperSenior	H60	H60	0.0	H60	0.5	H60	(1.5)	5.50%
Option ARM	Seasoned	SSNR	L/M70	L/M70	0.0	L/M70	0.5	M60	3.0	5.75%
		SN Mezz	40A	40A	0.0	40A	0.5	H30	2.0	6.50%
		Jr Mezz	M20	M20	0.0	M20	0.5	L20	2.0	7.50%
	2007	SSNR	L70	L70	0.0	L70	0.5	M60	3.0	6.00%
		SN Mezz	30A	30A	0.0	30A	0.5	H20	2.0	6.75%
		Jr Mezz	20A	20A	0.0	20A	0.5	H10	2.0	7.75%
Subprime	2006	3rd Pay	50A	50A	0.0	50A	1.0	M/H40	2.0	6.00%
		LCF	50A	50A	0.0	50A	1.0	M/H40	2.0	6.00%
	2007	3rd Pay	M/H40	M/H40	0.0	M/H40	0.0	M40s	0.5	6.00%
		LCF	M/H40	M/H40	0.0	M/H40	0.0	M40s	0.5	6.00%

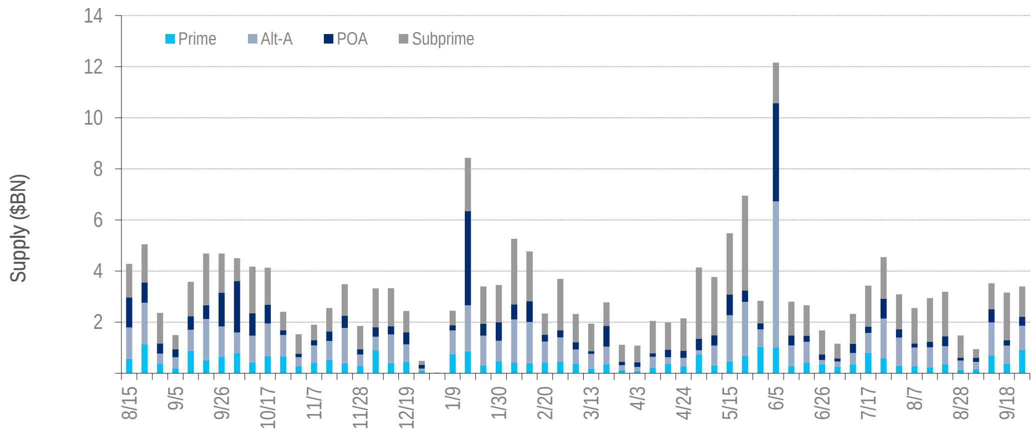
Source: Citi Research

Figure 26. Synthetic Price Snapshot

Index	Sub-Index	Tranche	Now	Last Week	Change	Last Month	Change	Jan-13	Change	YTM (100% Margin)	YTM (15% Margin)
ABX	ABX 07-2	Pen AAA	63.54	63.17	0.37	61.05	2.49	53.93	9.61	2.96%	9.39%
		AAA	53.92	53.63	0.29	51.33	2.59	49.05	4.87	3.73%	11.52%
	ABX 07-1	Pen AAA	64.67	63.88	0.79	62.23	2.44	64.23	0.44	3.61%	12.85%
		AAA	53.69	53.33	0.36	51.90	1.79	50.96	2.73	3.89%	12.68%
	ABX 06-2	Pen AAA	80.54	80.13	0.41	79.03	1.51	80.52	0.02	3.16%	13.20%
		AAA	72.48	72.42	0.06	67.85	4.63	67.29	5.19	3.61%	14.85%
	ABX 06-1	AAA	96.79	97.00	(0.21)	96.60	0.19	96.14	0.65	1.34%	4.41%
		AA	72.04	71.19	0.85	67.85	4.19	64.84	7.20	3.44%	13.63%
PrimeX	FRM.1		110.1	110.16	(0.06)	110.05	0.05	110.23	(0.13)	2.70%	13.70%
	FRM.2		103.1	103.16	(0.06)	103.03	0.07	103.43	(0.33)	2.30%	8.20%
	ARM.1		110.13	110.38	(0.25)	110.05	0.08	109.92	0.21	2.70%	14.50%
	ARM.2		102.9	103	(0.10)	102.85	0.05	102.09	0.81	3.40%	17.80%

Source: Citi Research

Figure 27. BWIC Volume by Product



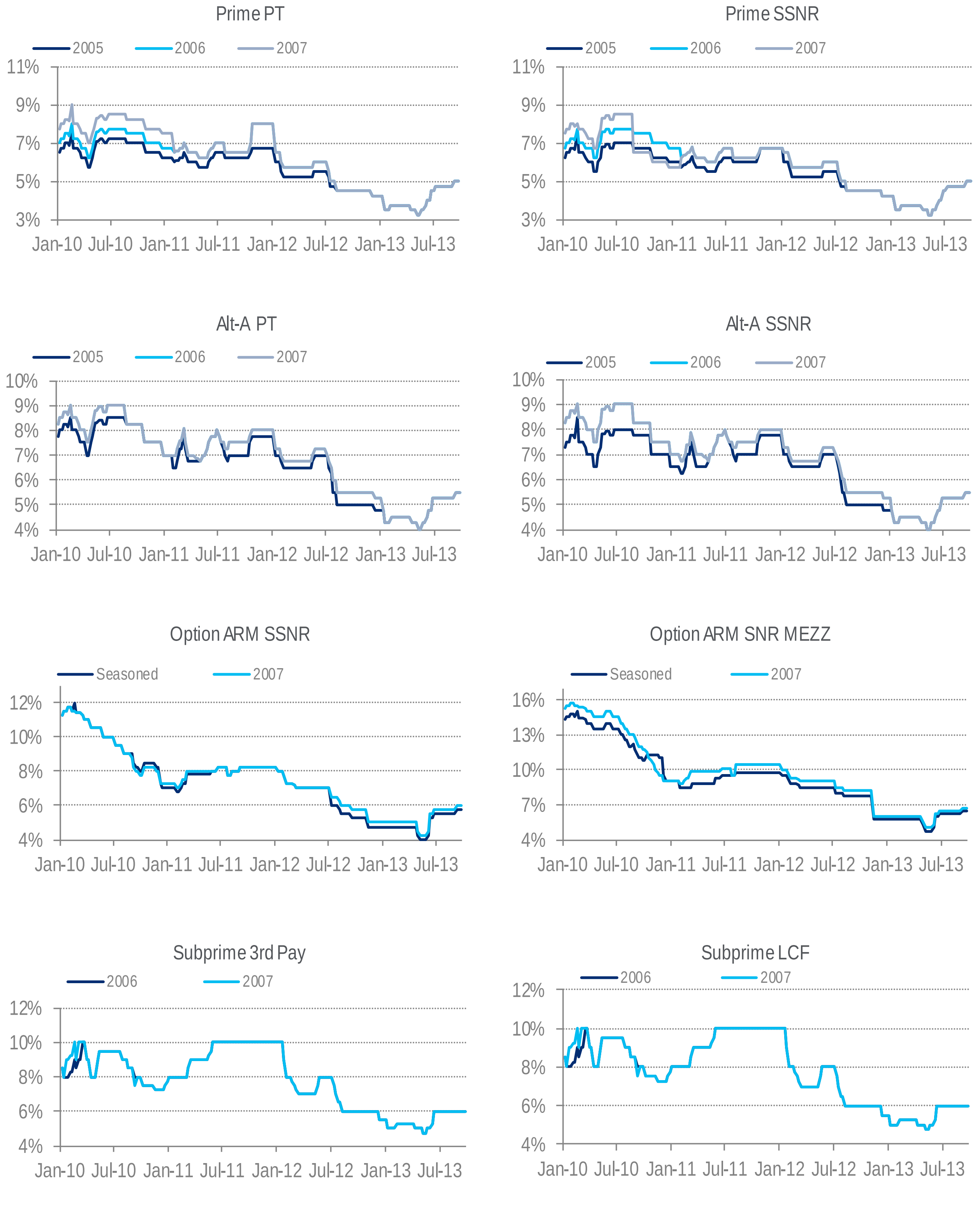
Source: Citi Research

Figure 28. 2013 New Issuance Summary

Deal Name	Settle Date	Deal balance ($MM)	CE*
SEMT 2013-1	1/15/2013	405.6	7.30%
SEMT 2013-2	1/30/2013	670.7	7.05%
CSMC 2013-TH1	2/27/2013	424.5	7.05%
SEMT 2013-3	3/1/2013	601.6	6.50%
SEMT 2013-4	3/21/2013	577.6	6.25%
CSMC 2013-IVR1	3/27/2013	391.2	7.30%
JPMMT 2013-1	3/27/2013	633.9	7.40%
EVER 2013-1	3/28/2013	309.5	8.05%
SEMT 2013-5	4/18/2013	464.2	6.25%
CSMC 2013-IVR2	4/29/2013	393.8	7.30%
SEMT 2013-6	4/30/2013	425.2	6.50%
SEMT 2013-7	5/23/2013	453.6	6.55%
JPMMT 2013-2	5/31/2013	442.5	10.00%
CSMC 2013-IVR3	5/31/2013	336.4	7.30%
EVER 2013-2	6/7/2013	303.3	8.05%
SEMT 2013-8	6/13/2013	460.2	7.10%
SAFT 2013-1	6/27/2013	495.7	20.00%
CSMC 2013-HYB1	6/28/2013	427.9	20.00%
CSMC 2013-IVR4	6/28/2013	407.1	12.00%
SEMT 2013-9	7/2/2013	463.6	7.00%
NRPMT 2013-1	7/15/2013	440.1	7.60%
SEMT 2013-10	7/31/2013	401	7.25%
JPMMT 2013-3	7/30/2013	345	7.05%
CSMC 2013-6	7/30/2013	597	14.00%
SEMT 2013-11	8/28/2013	346.3	8.00%
ABMT 2013-1	8/28/2013	434	7.70%
CSMC 2013-7	8/29/2013	400	7.50%
PMTLT 2013-1	9/26/2013	550	7.75%

Source: Bloomberg, Citi Research

Figure 29. Non-Agency Yield History



Source: Citi Research

Figure 30. Default Model Report

ISSUE YEAR	AMT OUT ($BB)	FACTOR	WALA	LOAN SIZE($K)	FICO	%INV	ORIG LTV	CURR LTV	60++ DQ(%)	Mods (%)	IO (%)	%in IO prd	Not DQ in 2Yr(%)	LAST 3 MONTH VPR	LAST 3 MONTH CDR	LAST 3 MONTH LS	Advrate	To Date(%OB) Cum Def	To Date(%OB) Cum Loss	Model Projections(%CB) Base Scenario 2 Yr Cum Def	Base 2 Yr Cum Loss	Base Life Cum Def	Base Life Cum Loss	Stress Scenario 2 Yr Cum Def	Stress 2 Yr Cum Loss	Stress Life Cum Def	Stress Life Cum Loss
Prime FIX																											
2004	4.6	0.12	114	302	711	9.3	69.7	54.3	7.9	5.5	1.4	1.4	86.58	28.9	1.6	25.6	95.8	1.0	0.3	3.9	0.7	6.7	0.9	6.3	1.3	10.4	2.1
2005	11.8	0.24	98	422	731	5.9	73.6	77.9	10.5	10.5	18.3	18.3	82.35	25.1	3.0	39.5	91.1	4.8	1.9	6.5	2.6	11.9	4.2	10.4	4.5	19.0	8.2
2006	16.3	0.26	87	468	731	6.1	76.7	90.0	14.1	17.0	30.5	30.3	77.39	22.2	4.9	45.2	89.5	8.6	3.8	9.1	4.4	17.1	7.8	13.9	7.1	26.7	13.8
2007	23.5	0.31	76	509	734	5.2	79.3	91.5	14.5	17.4	36.5	36.4	76.87	21.9	5.1	43.4	86.5	10.4	4.6	9.0	4.2	17.6	7.7	14.1	6.9	28.3	14.1
Total	**56.2**	**0.26**	**87**	**453**	**731**	**6.0**	**76.6**	**85.2**	**13.0**	**14.9**	**28.0**	**27.9**	**78.97**	**23.2**	**4.3**	**41.6**	**89.1**	**7.9**	**3.5**	**8.1**	**3.6**	**15.3**	**6.4**	**12.6**	**6.0**	**24.4**	**11.8**
Prime ARM																											
2004	13.6	0.14	110	343	730	10.8	72.4	64.0	7.8	4.8	72.8	18.5	88.07	17.1	2.3	34.3	90.0	2.5	0.8	3.6	1.1	7.2	1.8	6.9	2.4	12.3	4.0
2005	25.2	0.25	100	433	735	10.2	74.1	77.0	8.3	7.2	81.0	24.0	86.27	17.2	3.3	33.7	93.4	6.6	2.5	4.8	1.8	9.1	2.8	9.4	3.7	16.5	6.3
2006	18.5	0.29	89	497	732	10.2	75.5	89.1	11.3	13.4	90.2	43.5	80.66	14.0	4.7	39.0	90.6	13.7	6.0	7.4	3.3	13.7	5.2	14.0	6.5	24.5	11.0
2007	20.5	0.33	83	581	731	10.2	75.5	86.7	13.6	18.2	87.3	60.1	75.55	14.8	5.6	43.0	90.1	14.9	6.7	8.8	4.1	16.0	6.3	16.2	7.8	28.2	12.9
Total	**77.8**	**0.26**	**95**	**456**	**732**	**10.3**	**74.5**	**80.1**	**10.3**	**11.2**	**83.4**	**37.2**	**82.42**	**15.8**	**4.0**	**37.5**	**91.3**	**9.8**	**4.2**	**6.3**	**2.6**	**11.7**	**4.1**	**11.9**	**5.2**	**20.8**	**8.8**
Alt-A FIX																											
2003	6.1	0.12	122	116	715	31.2	72.2	50.9	9.9	7.5	1.7	0.9	83.56	17.8	1.8	47.4	90.7	2.1	0.8	4.4	1.4	7.9	2.0	7.8	2.7	13.1	4.3
2004	10.6	0.20	110	132	712	33.6	74.8	63.8	13.0	8.9	7.2	7.0	79.82	15.6	2.9	47.8	89.9	3.7	1.6	6.8	3.1	13.1	5.0	12.4	6.1	22.6	10.5
2005	32.9	0.32	98	186	713	19.8	76.5	83.4	17.1	13.8	30.0	29.5	73.49	13.2	4.9	52.0	87.6	10.4	5.2	9.3	5.0	20.0	9.6	16.8	9.6	34.2	18.8
2006	38.1	0.34	87	217	705	18.1	78.8	94.9	26.2	24.3	34.6	33.5	61.65	9.4	7.0	60.3	78.1	21.6	12.4	12.4	7.4	28.8	15.4	21.3	13.2	47.0	28.1
2007	29.3	0.42	77	272	707	15.1	77.9	93.1	26.0	27.6	40.6	40.2	61.19	11.3	6.8	57.8	83.0	22.9	12.9	11.9	6.9	28.7	14.9	20.2	12.2	47.2	27.7
Total	**117**	**0.33**	**91**	**197**	**709**	**19.9**	**77.2**	**86.1**	**21.5**	**19.9**	**30.6**	**30.0**	**67.65**	**11.9**	**5.7**	**55.6**	**83.7**	**16.2**	**8.9**	**10.5**	**5.9**	**23.8**	**12.0**	**18.3**	**10.7**	**39.5**	**22.6**
Alt-A ARM																											
2003	1	0.09	120	299	713	22.0	70.9	56.5	10.6	8.1	61.2	16.8	83.22	15.8	1.4	36.4	64.4	1.8	0.5	4.8	0.7	11.7	1.0	8.9	1.5	22.0	2.6
2004	10.1	0.14	109	239	713	23.2	79.5	77.3	12.9	13.0	75.6	40.1	79.75	9.2	4.6	38.6	66.4	6.0	2.3	7.5	2.8	17.4	4.2	14.2	5.7	29.0	9.6
2005	29	0.25	98	267	716	20.2	81.4	94.8	18.1	17.4	87.2	55.3	73.65	7.0	6.3	49.8	76.3	18.0	8.8	10.4	5.1	22.7	8.7	19.1	9.9	37.0	17.6
2006	32.6	0.28	87	318	711	17.2	82.9	105.9	26.4	28.4	88.7	66.4	61.91	6.9	8.3	58.7	68.8	32.9	18.1	14.4	8.5	32.0	15.1	25.1	15.1	48.8	27.2
2007	22.9	0.35	78	407	714	16.4	81.2	100.0	27.2	30.2	89.6	79.5	59.90	8.8	9.4	55.7	69.6	36.0	19.6	15.4	8.6	32.2	14.4	26.2	15.1	49.2	26.2
Total	**95.6**	**0.27**	**91**	**305**	**713**	**18.6**	**81.6**	**97.6**	**22.5**	**23.6**	**86.8**	**62.9**	**67.10**	**7.7**	**7.5**	**52.9**	**71.0**	**26.0**	**13.8**	**12.6**	**6.8**	**27.4**	**11.7**	**22.2**	**12.4**	**43.0**	**21.9**
Option ARM																											
2004	2.5	0.10	107	303	705	13.9	74.5	76.1	22.5	22.2	0.0	0.0	66.18	6.9	5.2	41.4	87.3	5.9	2.7	13.4	5.5	30.6	8.3	24.2	10.6	47.9	18.1
2005	22.2	0.19	97	361	700	15.9	76.3	93.0	29.8	27.7	0.0	0.0	56.06	5.2	9.1	51.0	75.5	19.0	10.2	16.1	8.2	37.6	14.1	27.2	14.6	56.0	26.8
2006	39.3	0.29	86	368	704	16.0	79.3	107.8	36.3	37.7	3.1	2.5	48.23	6.8	11.7	58.1	61.3	39.7	23.5	20.9	12.5	48.5	24.2	32.2	19.9	65.6	38.5
2007	31.2	0.40	77	385	710	14.9	78.7	104.5	35.8	38.0	30.7	29.4	46.88	9.8	12.1	56.7	59.6	43.2	25.9	21.0	12.5	48.0	24.5	31.6	19.5	66.1	39.1
Total	**95.2**	**0.30**	**86**	**370**	**705**	**15.6**	**78.3**	**102.5**	**34.3**	**35.1**	**11.4**	**10.7**	**50.08**	**7.4**	**11.0**	**55.5**	**64.7**	**35.1**	**20.6**	**19.6**	**11.3**	**45.3**	**21.5**	**30.6**	**18.3**	**63.1**	**35.4**
Subprime																											
2003	10	0.06	124	94	625	6.9	80.5	64.8	17.8	34.5	0.8	0.2	68.05	10.2	3.5	67.8	53.3	6.5	3.1	10.1	7.3	26.1	16.6	16.9	12.6	39.3	28.3
2004	27.2	0.09	111	117	629	6.7	81.2	74.8	22.3	42.0	6.0	0.3	62.03	8.7	4.5	71.0	51.0	8.3	4.7	11.0	8.0	30.9	19.4	18.6	14.0	44.0	31.5
2005	61.3	0.15	98	141	626	5.8	84.2	93.5	30.1	57.3	20.1	1.0	51.96	6.1	6.9	72.5	46.1	20.1	12.5	14.3	10.6	40.3	26.5	24.4	18.6	55.3	40.8
2006	106.6	0.24	87	150	624	5.2	85.5	105.8	35.0	63.1	16.1	1.9	46.37	3.9	8.2	77.1	47.1	37.8	26.6	16.7	13.5	46.7	34.9	27.4	22.5	63.0	51.3
2007	67.2	0.38	79	170	621	5.1	83.9	102.6	35.7	63.4	13.1	2.4	44.86	8.0	8.0	77.4	40.0	38.5	27.8	16.8	13.8	47.7	36.9	26.6	22.3	64.1	53.9
Total	**272.3**	**0.23**	**91**	**145**	**624**	**5.5**	**84.2**	**97.6**	**32.2**	**58.7**	**14.7**	**1.6**	**49.62**	**6.1**	**7.3**	**75.2**	**45.7**	**29.9**	**20.7**	**15.4**	**12.1**	**43.2**	**31.3**	**25.3**	**20.4**	**58.8**	**46.8**

-%OBand %CBstand for percent of original balance and percent of current balance respectively. Loss as a%OB= Loss to date + factor * (Loss as a %CB).

-The Base Scenario assumes that home prices rise 9% in the 1st year, 5% in the 2nd year, 4% in the 3rd year, and then increase by 3% per year, while unemployment goes to 7.1% by Q4 2013.

-The Stress Scenario assumes that home prices drop 4% in the 1st year, 1% in the 2nd year, remain flat in the 3rd year, and then increase by 3% per year, while unemployment peaks at 11% in 1 year.

-Cum Defaults and Cum Losses Include Losses arising from Loan Modifications as well.

-For details on our Model, refer to the white paper on our Loss Severity model, “A Loss Severity Model for Residential Mortgages,” January, 2008 and Default Model , “Modeling of Mortgage Defaults,” January, 2008

Source: Citi Research, CoreLogic Note: For more detailed information, please see https://www.citivelocity.com/menu/SECUR_OV?commentaryId=13073111401237411

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

IMPORTANT DISCLOSURES

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability which includes investment banking revenues.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Research product ("the Product"), please contact Citi Research, 388 Greenwich Street, 28th Floor, New York, NY, 10013, Attention: Legal/Compliance [E6WYB6412478]. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

NON-US RESEARCH ANALYST DISCLOSURES
Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. The legal entities employing the authors of this report are listed below:

Citigroup Global Markets Inc	Roger Ashworth; Raja Narayanan; Xing Wei

OTHER DISCLOSURES

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Research does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of Citi Research to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in Australia through Citi Global Markets Australia Pty Ltd. (ABN 64 003 114 832 and AFSL No. 240992), participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is

Singapore Ltd ("CSL") to selected Citigold/Citigold Private Clients. CSL provides no independent research or analysis of the substance or in preparation of this report. Please contact your Citigold//Citigold Private Client Relationship Manager in CSL if you have any queries on or any matters arising from or in connection with this report. This report is intended for recipients who are accredited investors as defined under the Securities and Futures Act (Cap. 289). Citigroup Global Markets (Pty) Ltd. is incorporated in the Republic of South Africa (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in Spain by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 29 Jose Ortega Y Gasset, 4th Floor, Madrid, 28006, Spain. The Product is made available in the Republic of China through Citigroup Global Markets Taiwan Securities Company Ltd. ("CGMTS"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan and/or through Citibank Securities (Taiwan) Company Limited ("CSTL"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan, subject to the respective license scope of each entity and the applicable laws and regulations in the Republic of China. CGMTS and CSTL are both regulated by the Securities and Futures Bureau of the Financial Supervisory Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced or quoted in the Republic of China by the press or any third parties [without the written authorization of CGMTS and CSTL]. If the Product covers securities which are not allowed to be offered or traded in the Republic of China, neither the Product nor any information contained in the Product shall be considered as advertising the securities or making recommendation of the securities in the Republic of China. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security or financial products. Any decision to purchase securities or financial products mentioned in the Product must take into account existing public information on such security or the financial products or any registered prospectus. The Product is made available in Thailand through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 18/F, 22/F and 29/F, 82 North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand. The Product is made available in Turkey through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey. In the U.A.E, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFSA") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different Citi Research ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties. The Product is made available in United Kingdom by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. This material may relate to investments or services of a person outside of the UK or to other matters which are not regulated by the FSA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in United States by Citigroup Global Markets Inc, which is a member of FINRA and registered with the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is regulated by Financial Services Authority.

Pursuant to Comissão de Valores Mobiliários Rule 483, Citi is required to disclose whether a Citi related company or business has a commercial relationship with the subject company. Considering that Citi operates multiple businesses in more than 100 countries around the world, it is likely that Citi has a commercial relationship with the subject company.

Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to Citi Research's Products can be found at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures.

Compensation of equity research analysts is determined by equity research management and Citigroup's senior management and is not linked to specific transactions or recommendations.

The Product may have been distributed simultaneously, in multiple formats, to the Firm's worldwide institutional and retail customers. The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted.

Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product.

With the exception of our product that is made available only to Qualified Institutional Buyers (QIBs) and other product that is made available through other distribution channels only to certain categories of clients to satisfy legal or regulatory requirements, Citi Research concurrently disseminates its research via proprietary and non-proprietary electronic distribution platforms. Periodically, individual Citi Research analysts may also opt to circulate research posted on such platforms to one or more clients by email. Such email distribution is discretionary and is done only after the research has been disseminated via the aforementioned distribution channels. Citi Research simultaneously distributes product that is limited to QIBs only through email distribution.

The level and types of services provided by Citi Research analysts to clients may vary depending on various factors such as the client's individual preferences as to the frequency and manner of receiving communications from analysts, the client's risk profile and investment focus and perspective (e.g. market-wide, sector specific, long term, short-term etc.), the size and scope of the overall client relationship with Citi and legal and regulatory constraints.

Citi Research product may source data from dataCentral. dataCentral is a Citi Research proprietary database, which includes Citi estimates, data from company reports and feeds from Reuters and Datastream.