

August 23, 2017

Specialty Finance

Analysts

Henry Coffey, CFA

212-833-1382

Henry.Coffey@wedbush.com

Peter J. Winter

212-938-9942

Peter.Winter@wedbush.com

Jason Weaver, CFA

212-833-1383

Jason.Weaver@wedbush.com

Jay McCanless

212-833-1381

Jay.McCanless@wedbush.com

David J. Chiaverini, CFA

212-938-9934

David.Chiaverini@wedbush.com

Rethinking Mortgage: The Credit Box is Widening, Doors Are Opening... Slowly

Wedbush View. Driven by a significant improvement in loan quality and the need for the mortgage industry to reach outside of its comfort zone, the research of our FIG and housing teams suggest that the mortgage market is moving past the more restrictive phase seen over the last five years and evolving in a manner that has the potential to add \$150-\$200 billion in originations to what is estimated to be a \$1.6 trillion a year mortgage market. While small in percentage terms, our view is that the bulk of this incremental volume will make its way to a narrow range of mortgage originators and service providers prepared to capture this growth. Our companies under coverage that are best positioned to benefit are: FBC, NSM, FRC and USB. Plus, a bigger mortgage market and changing demographics should have a positive impact on other parties, including suppliers to the home builder market (BLDR) and FinTech companies such as BKFS, and ELLI. Key factors driving our investment conclusion include:

1. **Excepted Gains in GSE/GOV volume from a widening of the credit box:** While Mel Watt, director of the FHFA (oversees the GSEs) has been actively calling for a wider, more inclusive mortgage box, existing originator overlays limit the number of sub 680 FICO mortgages originations approved in the GSE/GOV market. Expanding the level of mortgages approved to borrowers with FICOs of between 660-620 from its current 4.6% to the 9% seen pre-crisis, could add \$75-\$100 billion a year to annual volumes.
2. **Bank Easing Residential Mortgage Credit Standards:** In the latest release (July 31) of the Fed's Senior Loan Officer's Opinion, banks continued to ease the underwriting standards on residential real estate (RRE), while tightening the underwriting for other consumer loan portfolios, such as auto and credit cards, setting the stage for stronger RRE loan growth. In addition, banks play an important role as both mortgage originators warehouse lenders and aggregators of product that ultimately works its way to the securitization market such as non-Agency Jumbos and non-QM mortgages. **Bottom line:** banks are optimally positioned to benefit from a potentially bigger mortgage market acting as aggregators to third-party originators in the non-QM market and non-agency prime Jumbo markets.
3. **Non-QM lending gaining traction:** the non QM market is gaining increasing acceptance among bank lenders and the securitization market. The primary focus on QM lenders is on near prime to super prime borrows looking for a mortgage product that offers more flexibility than a conventional/QM qualified mortgage. While still in its early days, the industry sees this as a market capable of supporting \$50 billion to \$100 billion in additional activity per year.
4. **Growth in Emerging Cohorts:** The millennial represent a much larger set of cohorts than anything that has preceded them. The next pool of first time home buyers about to cross into home buying age (31) is 1.2x anything that proceeded them (and significantly larger than Gen-X) and bring to the table balance sheet impaired by high levels of student debt and for many, non-traditional sources of income.

Wedbush Securities does and seeks to do business with companies covered in its research reports. Thus, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. Please see pages 35-37 of this report for analyst certification and important disclosure information.

Summary

Driven by the strength of the housing market, a significant improvement in mortgage credit metrics, and the hunt for growth, the research of our FIG and housing teams suggest that the mortgage market is moving past the more restrictive phase seen over the last five years and evolving in a manner that has the potential to add \$150 billion to \$200 billion in originations to what is estimated to be a \$1.6 trillion a year mortgage market. Our intuition is that a disproportionate percentage of this increase in volume will land on the shoulders of a relatively narrow group of service providers. Our discussions with lenders make it clear that there are companies already aggressively addressing these opportunities and others still in a wholly defensive mode. Our views on where the mortgage industry is evolving are based in part on the following:

1. FICO Constraints & Overlays in the GSE/GOV market

One of the bigger issues holding back the GSE/GOV or conventional/conforming market is lender “overlays” which generally are hesitant to approve a mortgage to anyone with a FICO below 680. Fannie Mae has programs in place for borrowers with FICO as low as 620 with LTVs as high 97% and the government-insured programs go deeper than this. The FHFA has plans afoot to launch a credit scoring engine in 2019 which factors in nonconventional sources of credit and income verification; and Mel Watt, Director of the FHFA, would like to see mortgage lenders focus on providing borrowers with high levels of student and other debt burdens the opportunity to become qualified for mortgage loans and low to middle income borrowers looking to finance housing.

- **Fannie most recent lender survey shows an increase willingness to widen lending standards.** We think the next FICO milestone is to break the 680 barrier and originate more mortgages to borrowers with FICO scores between 620 and 660. A reinvigorated GSE/GOV market could take mortgage originations with 620-660 FICO scores from their current 4.6% of the market to something closer to the 9% seen in the pre-crisis years (pre 2007). This would represent a \$75 to \$100 billion boost in volume without breaking into credit levels considered subprime by conventional standards.
- Three companies at the top of the GSE/GOV league tables include Nationstar (NSM) which has a history of providing HARP/HAMP modifications and special servicing; FlagStar (FBC) which operates a national correspondent lender and is building out its direct distribution platform, and US Bancorp (USB) which is currently the country's 5th most active GSE mortgage lender (6th for all mortgage classes). The largest GOV lenders in the country are Freedom Mortgage (private) and PennyMac Financial Services (PFSI).

2. Banks and their Growing RRE Portfolios

In the latest release of the Fed's Senior Loan Officer's Opinion Survey (SLOOS, released July 31, 2017), banks continued to ease the underwriting standards of residential real estate (RRE), while tightening the underwriting for other consumer loan portfolio, including auto and credit cards

Gains in RRE loan balances have been positive for the last 4 years and its relative contribution to loan growth is increasing. Although RRE loans as a percentage of total loans have declined from a peak of 41%, right before the financial crisis (2005) to 30% in 2016, they have been growing at solid pace, since hitting a trough in 2013. Approximately 27% of all residential real estate loans are held as whole loans by banks and banks are optimally positioned to act as aggregators to third-party originators in the non-QM market and non-agency prime Jumbo markets.

In addition to holding more mortgages on the balance sheet, banks play an important role as both mortgage originators warehouse lenders, and aggregators of product that ultimately works its way to the securitization market such as non-Agency Jumbos and non-QM mortgages.

3. Non-QM-A Big Tent

Non-QM captures a very broad range of transactions including mortgages that meet our definition of sub-prime (sub 620 FICO's and other factors). The specific subcategories include borrowers with hard to verify sources of income, higher debt-to-income levels; but have high levels of disposable income, investor mortgages, or other issues that make a more customized mortgage desirable.

- The market is small but growing. There are about 10-15 major originators/investors focused on this market as well as bank originators such as Flagstar (FBC) and, the party considered to be the 100 pound gorilla in the equation, Morgan Stanley (MS). In the next 12 months we are looking for \$2-\$5 billion in securitization, and estimates suggest that the market could grow to \$50 billion to \$100 billion in annual originations.
- In addition to FBC, NSM are both focused on building out capacity in the non-QM market and Impac Mortgage (IMH) is planning its first non-QM securitization in late 2017 or early 2018. The largest/most active lenders in this market are private and include Citadel Servicing and Deephaven.

4. Emerging Cohorts

The current sub-cohorts in the 25-29 age group represent 23.5 million first-time or move-up home buyers. This is 1.2x the size of the preceding group (30-35 year olds) and multiples larger than any cohort older than this. In addition, we would note that that the home ownership rate of this group is less than 35%, vs. the > 60% for the 40-45 year old age group. We think this new wave of home buyers, only 2-3 years away from their prime home buying years (median age of first time home buyer=31) will approach the mortgage application/acquisition process with a wholly different set of expectations and push both purchase money originations and home sales higher than what we are seeing in the current climate

- Two lenders who are already committed to young professionals moving into their home ownership years with student debt and a need for both conforming and prime/super prime Jumbo mortgages are SoFi and First Republic (FRC).

5. Housing Supply—a Noticeable Negative

The supply of housing for new home buyers is relatively constrained and for many borrowers, finding the right property can be more of a problem than getting it financed. This was one factor behind HomeStreet's (HMST) lower 2Q17 mortgage volumes, and while HMST is somewhat regionally bound to the Western United States, comments from bankers, and anecdotal tales from home builders suggest this is a national problem as well. "Time on the market" is an indicator that tracks the supply-demand equation, and average TOM for June 2017 was 4.3 months, versus 4.7 in June of 2016. For some perspective, the historical average is 6 months. There are factors at play, such as declining affordability and rising rates, but these have not held back the market before.

6. Second Derivative Opportunities

A bigger mortgage market should have a positive impact on other parties, including suppliers to the home builder market (Builder FirstSource, BLDR) which is supplying product in over 300 MSAs. On the FinTech front, industry checks points to a very wide digital divide between those who have spent heavily to develop the origination/servicing technology to succeed, and those who wish they had. A larger more, demanding mortgage market would be a plus for FinTech companies such as private, DocuTech, as well as Ellie Mae (ELLI) and Black Knight (BKFS).

The Long and Short of Things

Figure 1: Company Recommendations

Name	Ticker	Price	Focus	Rating	Price Target	Upside	PE 18	P/TBV	Dividend Yield
Mortgage									
Nationstar Mortgage Holdings Inc	NSM	\$16.66	Mortg	OP	\$19.00	14%	8.3x	104%	0.0%
Flagstar Bancorp Inc	FBC	\$31.41	Bank+Mortg	OP	\$35.00	11%	11.9x	129%	0.0%
First Republic Bank	FRC	\$97.07	Bank	OP	\$119.00	23%	18.0x	257%	0.7%
U.S. Bancorp	USB	\$51.95	Bank	Neut	\$55.00	6%	13.7x	265%	2.2%
Ellie Mae Inc	ELLI	\$82.90	Fin Tech	Neut	\$90.00	9%	48.2x	455%	0.0%
Black Knight Financial Services Inc	BKFS	\$42.25	Fin Tech	OP	\$44.00	4%	26.4x	nmf	0.0%
Builders FirstSource Inc	BLDR	\$14.87	Building	OP	\$20.00	35%	10.3x	nmf	0.0%

Source: Wedbush Securities Inc. Estimates, Consensus Estimates, Company Reports, and SNL Priced as of 8/23/2017

The mortgage market has been much larger than it is today, and from the perspective of equity investing, getting it right can create significant levels of outperformance. Before its demise and final sale to Bank of America (BAC), between December 1998 and December 2006, Countrywide's (CCI) shares had an eight year run in which the stock appreciated at an annualized rate of 16.5% (vs. 1.8% for the S&P 500). Between December of 2007 and December 2013, Ocwen's (OCN) shares had a six-year run in which the stock appreciated at an annualized rate of 46.8% (vs. 3.9% for the S&P 500). When it goes poorly, as we saw with both CCI and OCN, the rout tends to come at 3-4x the speed of the rally. The list of stocks likely to benefit from an upsurge in mortgage volume includes the following:

1. NSM.

NationStar Mortgage's (NSM, OP) roots are in the management of distressed portfolios and the company has a history of providing both work-out/loan modifications to distressed borrowers and processing foreclosures inside of required investor and regulatory guidelines where necessary. The company is actively growing its subservicing business and expects to launch a non-QM product in late 2017/early 2018.

2. FBC.

Flagstar (FBC, OP) operates two related businesses—mortgage production and real estate finance. The largest aspect of the company's mortgage company is originating conventional/conforming and prime Jumbo through both its correspondent and retail-direct channels. Like so many participants in non-QM, FBC sees this as an accommodation targeted to existing or new customers at the highest end of the credit spectrum. Its real estate finance group has a distinct edge when it comes to funding product for the banks own portfolio or holding loans being pooled for an eventual securitization.

3. FRC.

First Republic (FRC, OP) aims to be the go-to bank for high net worth individuals and the majority of its loan portfolio is weighted to jumbo mortgages. The company's residential mortgage portfolio has a median home value of \$1.2 million, a median loan outstanding of \$700,000 (58% LTV), and a median FICO of 774. While FRC is not widening its credit box, it is widening its funnel to generate more clients. The company is doing this by offering a student debt refinancing product at an attractive rate, known as the Eagle Gold All-in-One loan. This is the company's way of attracting its next generation of clients, as the millennial cohort is much younger than its typical

customers. The student loan product is targeting clients with an average age in the early 30s, which is a decade or more younger than FRC's typical home lending client that is 40+ years old. The strategy aims for the bank to grow with these millennial clients as they age and transition over time out of student debt products and into mortgage products. We expect FRC's effort in targeting younger clients should help support double-digit loan growth for years to come.

4. USB.

U.S. Bancorp (USB, N) has made a concerted decision to grow 1-4 family mortgages with an emphasis on prime jumbo mortgages. USB stayed on the sidelines and did not offer exotic mortgage products during the housing boom; which positioned them to be more active post the housing crisis. USB is now the 5th largest loan originator in the US vs. 25th prior to the onset of the credit cycle. FICO scores and LTVs have not changed in the last couple of years as they have stayed away from sub-prime and near prime real estate loans.

5. ELLI.

Ellie Mae (ELLI, N) produces a leading SaaS platform for the mortgage origination industry which covers 30% of the retail mortgage origination market as of 2016. As mortgage originators seek to improve compliance and productivity in the face of a the emerging tailwind of first time and move up borrowers, solutions like Encompass (ELLI's flagship platform) will see increasingly growing demand leading to greater user fees, volume based pricing revenues, and wider margins owing to ELLI's high operating leverage.

6. BKFS.

Black Knight Financial services (BKFS, OP), formerly a subsidiary of FNF, currently services over 60% of the 1st lien mortgages domestically and market share continues to rise. Its data and analytics segment also covers the bulk of the US with services being sold to diverse clients such as the rea estate industry, mortgage originators and investors, as well as the government sector. With steep prior penalties surrounding past servicing abuses, it would stand to benefit if other mortgage servicers decide to mitigate risks by partnering with BKFS as a robust servicer platform or as an information services provider.

7. BLDR.

Builders FirstSource (BLDR, OP) generates 75% of annual revenues from single family construction and 25% from repair and remodel spending. Assuming the mortgage market changes detailed in this report encourage more spending and higher volumes of building material sales, we believe BLDR should benefit from that surge in business. We see BLDR as a more likely beneficiary than our homebuilder coverage because BLDR has a national scope versus the public builders' concentration on approximately 10% of the metropolitan statistical areas (MSAs) in the United States.

Open Issues & Our Lexicon

The bulk of what we are seeing is more of an evolution than a revolution and change is likely to come slowly. The non-QM market will follow the lead of the securitization market and be driven heavily by originators' ability to accurately and efficiently originate loans that meet whole loan investors' (or their ABS counterparts') demands for properly underwritten and documented loans. Expanding the FICO range of GSE/GOV volume is also going to take some assurances from the FHFA, as well as Fannie and Freddie and a modification of past practices by the Department of Justice surrounding put back risk. In addition, a revision in servicing contracts would go a long way to encouraging originators.

1. Single vs. Multifamily—home owners or renters?

The immediate conclusion is that a more open mortgage market will cause renters to move to being owners and that a more open mortgage market is bad for single and multifamily rental volumes and values. This is to some extent true, but, demographic data suggest that there is long-term support for rental.

Figure 2: Home Ownership and Rental Levels – JCHS Projection

	Actual		Projected		
	2015	2020	2025	2030	2035
Total Households (mm)	214.9	131.8	138.4	144.6	149.9
Base Scenario					
Homeownership Rate	63.5%	63.6%	63.7%	63.5%	63.3%
Total Homeowners	79.3	83.8	88.2	91.9	95
Homeowner Growth 2015-		4.6	8.9	12.6	15.7
Total Renters	45.6	48	50.3	52.7	55
Renter Growth 2015-		2.5	4.7	7.1	9.4
Low Scenario					
Homeownership Rate	63.5%	60.7%	60.8%	60.7%	60.6%
Total Homeowners	79.3	80	64.2	87.8	90.8
Homeowner Growth 2015-		0.7	-15.1	8.5	11.5
Total Renters	45.6	51.9	54.2	56.8	59.1
Renter Growth 2015-		6.3	8.7	11.2	13.5
High Scenario					
Homeownership Rate	63.5%	64.9%	65.0%	64.9%	64.7%
Total Homeowners	79.3	85.5	90	93.8	97
Homeowner Growth 2015-		6.3	10.7	14.5	17.7
Total Renters	45.6	46.3	48.5	50.8	53
Renter Growth 2015-		0.8	2.9	5.2	7.4

Source: JCHS: Harvard Joint Center for Housing Studies; population in millions

2. Not NINJA lending...but maybe seconds and HELOCs

It is important to emphasize that we are not looking for a reversion to the go-go days of pre 2007. Movies have been made about the excesses of this market and our expectation is not that nonprime lending grows from its current level of \$20 or so billion a year in originations to the \$1.0 trillion a year seen in 2005-2006. Non QM lending is the exact opposite of the old NINJA loans (No Income, No Job Application) and to the extent that there exist a viable subprime market, our analytics indicate that it would be limited to \$3-\$5 billion a year in production.

On the old product all over again, we would not be wholly surprised to see the restart of some version of home equity lending either in the form of second's used in lieu of a cash out financing, home equity lines of credit (HELOCs—they still exist but are rare relative to

past days), and special purpose loans secured by residential real estate such as a student loan.

3. Our Lexicon

We are not offering a full blown glossary, but there are a lot of terms in the mortgage business where we think a tighter definition will clean up the dialogue:

Conforming: A conforming mortgage is a mortgage that conforms to GSE guidelines, regarding credit and product types, and is below a certain size; currently \$424,100, except in certain high-cost markets. Conforming does not generally refer to the GOV market, but it would be simpler if it did.

Conventional: We mean this to be any mortgage that meets the basic characteristics of being QM, or looks like a regular mortgage: fixed rate or an ARM, with a long, 15-30 year amortization rate and debt to income and LTV ratios that conform to the requirements of the GSE/GOV market. To us it could be a Jumbo mortgage, but that is not how the term is used, and, for reasons that we do not use, the market often talks about conventional/conforming.

GSE/GOV: The government sponsored entities (GSEs) now in receivership and overseen by the FHFA (Federal Housing Finance Agency) are what most know Fannie and Freddie: Fannie Mae (Federal National Mortgage Association-FNM) and Freddie Mac (Federal Home Loan Mortgage Corp-FRM). The government insured market (GOV) is primarily loans originated with insurance provided by the FHA, the VA, and the USDA. GNMA are bond issued to fund GOV loans, insured by these entities.

Jumbo: A mortgage bigger than \$424,100. Non-agency Jumbo's are Jumbo loans originated and funded outside of the GSEs. The jumbo market is, to us, a market of prime/super prime borrowers.

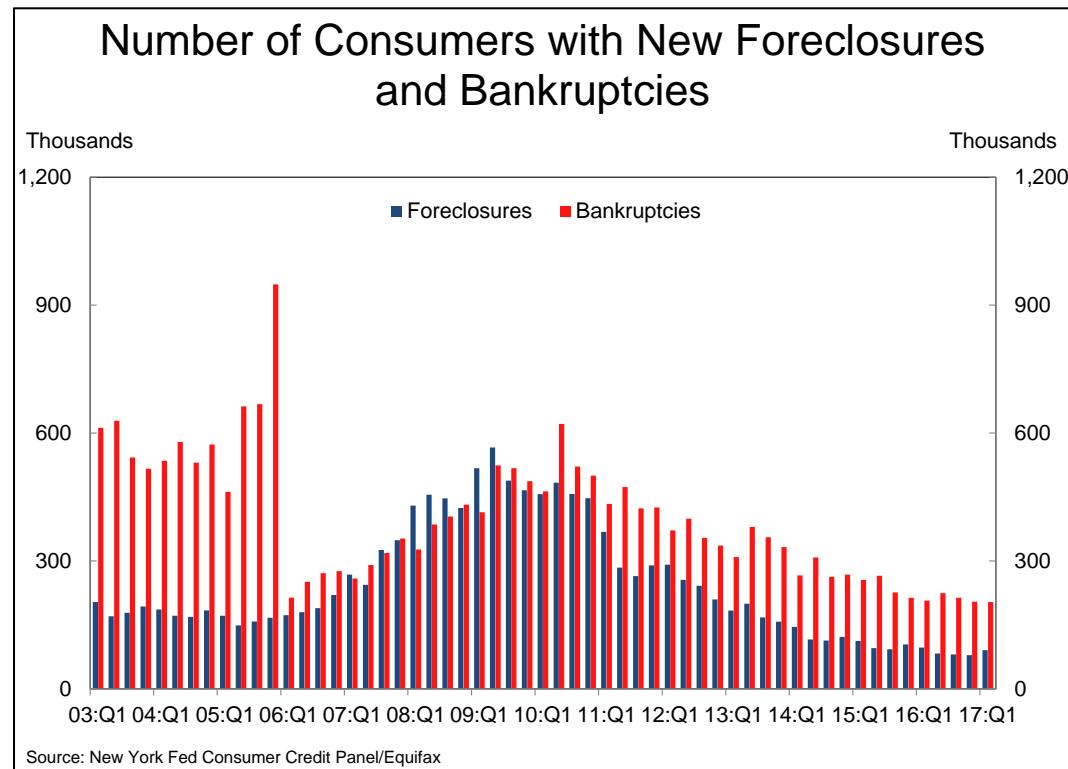
Non-prime: We don't use the term non-prime intentionally in this report except where other parties include it, and non-agency just means any mortgage funded in a securitization not backed by the GSEs (we prefer the term PLS, private label securitization).

Subprime: We are using a definition of subprime that is consistent with that used in other areas of consumer finance. A subprime mortgage is a mortgage to a borrower with a FICO below 620 who has a blemished credit record which could include recent unexplained mortgage delinquencies, a foreclosure in the last 7 years, our other factors that keep them out of the GSE/GOV market. 620-660 is "near prime" and we use 660 as the FICO cut off for prime.

Overview: Factors Changing the Mortgage Market

Our collective view is that over the next several years both the supply of mortgage finance (the willingness of originators and investors to extend credit) and the demand for housing finance will increase, and the market will grow in ways that properly quantifies and manages credit and regulatory risk. There are lenders in the GSE/GOV market that have already cracked the code for originating 620-660 FICO mortgages without putting their company or servicing operation at risk, and as much as everyone likes to complain, we think TRID, the ability to pay rules, and the skin-in-the-game requirements have strengthened the overall tone of the market.

Figure 3: Foreclosures & Bankruptcies



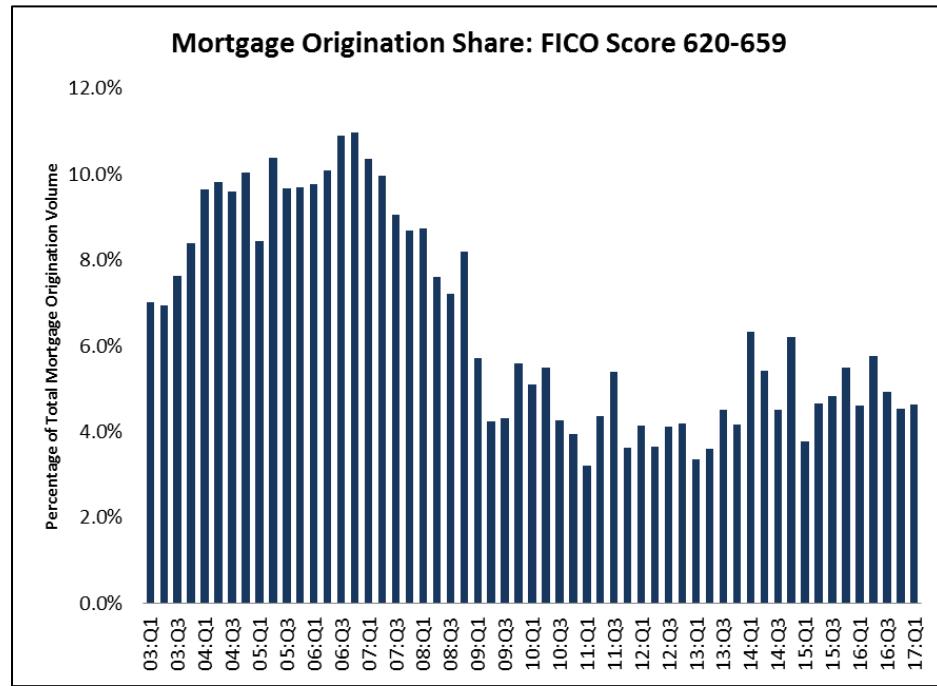
In the face of a rising rate environment, mortgage bankers are going to need to broaden their reach beyond the conventional market of mortgages made with LTVs of 80-90% to borrowers with FICOs above 680 and easily documentable W2 income, looking for a fixed rate 15-30 year mortgage and look at breaking below the 680 FICO floor. This will be particularly true for the GSE market. In addition, we think banks and correspondent mortgage companies are going to need to broaden their own product mix to tap into the broad range of opportunities outside of the QM/QRM box. The need for growth is a powerful force and the data above on credit performance is just one indication of the current strength of the housing finance market. And no, we are not looking for a \$1 trillion non-prime market and a return to the NINJA days.

GSE/GOV-breaking the 680 FICO Barrier

A major holdback to larger volumes to the GSE/GOV market is the overlays put in place by most mortgage bankers and the most visible restriction today is the lack of mortgages made to borrowers with sub 680 FICO scores.

We think the next FICO milestone is around 620 and that a reinvigorated GSE/GOV market could take mortgage originations with 620-660 FICO from their current 4.6% of the market, to something closer to the 9.0% seen in the pre-crisis years (pre 2007). If fully effective, this would represent a \$75 billion to \$100 billion boost in volume.

Figure 4: Originations by Risk Score



Source: NY Fed Data

The issue is not a lack of programs for borrowers with lower FICOs or limited down payments. Fannie Mae's upfront loan level price adjustments (rate premiums) allow for anything up to a 90% LTV and programs such as "Home Possible" (Freddie Mac) and "HomeReady" (Fannie Mae) allow LTVs up to 97%.

Figure 5: Upfront Loan-Level Price Adjustments

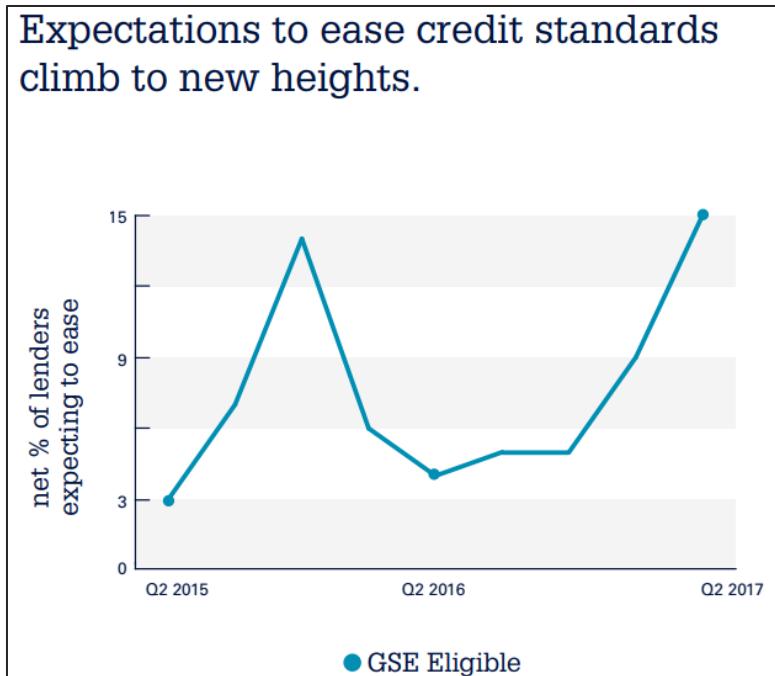
Representative Credit Score	LTV Range							
	Applicable for all mortgages with terms greater than 15 years							
	≤ 60.00%	60.01 – 70.00%	70.01 – 75.00%	75.01 – 80.00%	80.01 – 85.00%	85.01 – 90.00%	90.01 – 95.00%	95.01 – 97.00%
≥ 740	0.000%	0.250%	0.250%	0.500%	0.250%	0.250%	0.250%	0.750%
720 – 739	0.000%	0.250%	0.500%	0.750%	0.500%	0.500%	0.500%	1.000%
700 – 719	0.000%	0.500%	1.000%	1.250%	1.000%	1.000%	1.000%	1.500%
680 – 699	0.000%	0.500%	1.250%	1.750%	1.500%	1.250%	1.250%	1.500%
660 – 679	0.000%	1.000%	2.250%	2.750%	2.750%	2.250%	2.250%	2.250%
640 – 659	0.500%	1.250%	2.750%	3.000%	3.250%	2.750%	2.750%	2.750%
620 – 639	0.500%	1.500%	3.000%	3.000%	3.250%	3.250%	3.250%	3.500%
< 620 ⁽¹⁾	0.500%	1.500%	3.000%	3.000%	3.250%	3.250%	3.250%	3.750%

Source: Fannie Mae

Underneath the pricing overlay reflected above, the GSEs have basic disqualifying criteria related to foreclosures (no foreclosure in the last 7 years or no "deed-in-lieu" defaults in the last five) and a limit (usually two) of unexplained recent delinquencies mortgage delinquencies in the last year. In addition, and each of the GSE has their own credit scoring black box. On this front, in 2019, Mel Watt has indicated that the GSEs will also be implementing revised credit scoring models to include items such as a borrowers rent and utility payments when they move to the common securitization platform.

The revision of rep and warranty guidelines back in 2015, and comments from Mel Watt as recently as August 2017, have done a lot to bring lenders back into the mortgage market and we would argue that the market has already digested the requirements of TRID. Mel Watt's most recent speech is worth reading ([located here](#)). The hold back, when we talk to mortgage bankers, is the higher propensity of sub 680 FICOs to become delinquent, high costs associated with servicing/rehabilitating delinquent loans, and both the direct cost, and related put back risk, tied to loans that go into foreclosure. While we are still getting mixed messages about the willingness of GSE/GOV lenders to leap past the 680 FICO mark, in their 2Q17/June survey, Fannie Mae indicated that mortgage bankers were, or were considering, widening their risk tolerance, mainly in an effort to shore up declining profitability and volumes.

Figure 6: Credit Standards Expectations



Source: Fannie Mae Mortgage Lender Sentiment Survey

The League Tables—A big shift of the “who’s who” in GSE/GOV

While the big three (Wells, JPM Chase, and Bank of America) are still prominent, the league tables are now populated by growth-oriented, non-bank originators who in many cases were essentially unknown 5 years ago. PHH is going away as an active originator of primary product, but non-banks such as PFSI, NSM, and private loanDepot, are looking for ways to grow their role in the GSE/GOV equation and Freedom, has remained unequivocal in its commitments to the GOV market.

Figure 7: League Tables – Fannie and Freddie Originations

Top GSE Originators (Dollars in Billions)				
Rank	Lender		LTM Share	
1	Wells Fargo	Bnk	\$150.6	13%
2	Quicken Loans	Ind	\$66.2	6%
3	Chase	Bnk	\$54.8	5%
4	PennyMac	Ind	\$26.1	2%
5	U.S. Bank Home Mortgage	Bnk	\$26.0	2%
6	loanDepot.com	Ind	\$24.2	2%
7	Caliber Home Loans	Bnk	\$22.4	2%
8	Bank of America	Bnk	\$21.7	2%
9	United Wholesale Mort.	Ind	\$21.0	2%
10	Flagstar Bank	Bnk	\$20.5	2%
11	Amerihome Mortgage	Ind	\$20.0	2%
12	Nationstar	Ind	\$14.7	1%
<u>Others</u>			<u>\$652.9</u>	58%
Estimated Totals for All Lenders:				\$1,121.0

Source: Inside Mortgage Finance

Figure 8: League Tables – FHA, VA, USDA Programs

Top GOV Producers (Dollars in Billions)				
Rank	Lender		LTM Share	
1	PennyMac	Ind	\$47.6	8.6%
2	Freedom Mortgage	Ind	\$43.5	7.9%
3	Wells Fargo	Bnk	\$36.8	6.7%
4	Quicken Loans	Ind	\$25.9	4.7%
5	Caliber Home Loans	Bnk	\$18.5	3.4%
7	U.S. Bank	Bnk	\$14.3	2.6%
6	Amerihome Mortgage	Ind	\$13.5	2.4%
8	loanDepot.com	Ind	\$12.2	2.2%
10	USAA FSB	Bnk	\$11.1	2.0%
9	Flagstar	Bnk	\$10.2	1.9%
12	The Money Source	Ind	\$8.1	1.5%
11	Lakeview Loan Servicing	Ind	\$7.0	1.3%
<u>Other</u>			<u>\$302.3</u>	54.9%
Estimated Totals for All Lenders:				\$551.0
				100.0%

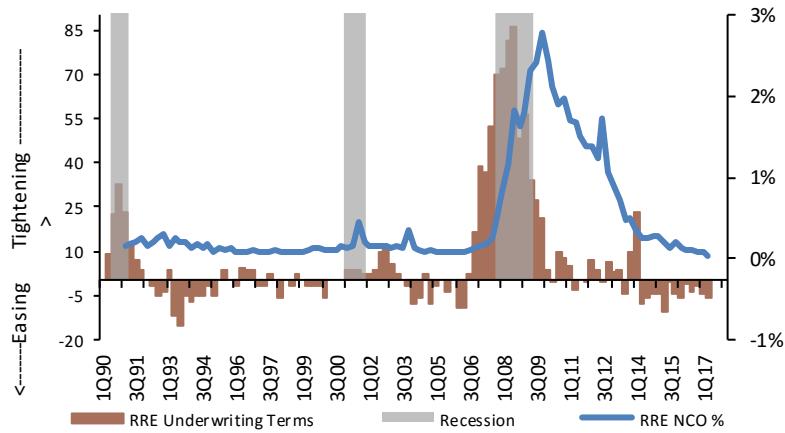
Source: Inside Mortgage Finance

Banks-easing on mortgage

In addition to their role as mortgage originator/servicers, ~27% of all mortgages are held by banks as whole loans on their balance sheet, plus banks play a major role providing liquidity and warehouse financing to independent mortgage companies.

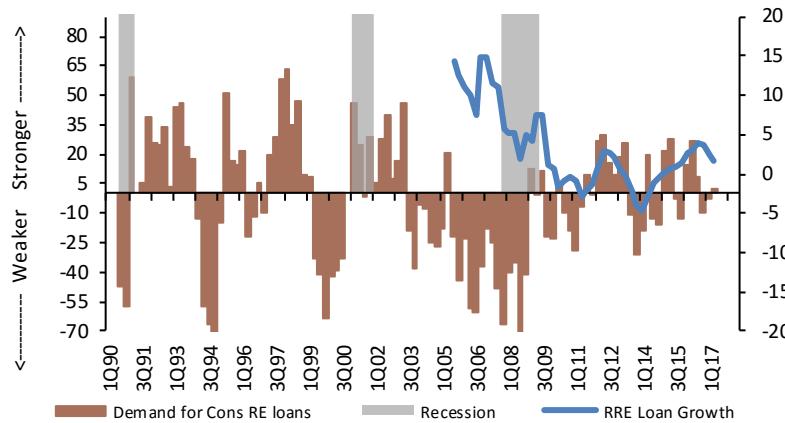
The Federal Reserve conducts a quarterly survey with 75 banks on bank lending practices called the Senior Loan Officer Opinion Survey (SLOOS). In the latest survey (July 31), loan demand weakened for the various loan categories, except for residential real estate (RRE), reflecting the benefit of lower mortgage rates (Figure 9). Moreover, banks continue to ease underwriting standards for residential real estate (Figure 8), while tightening underwriting standards for commercial real estate (including multi-family) and consumer loans, such as auto and credit cards.

Figure 9: Residential Real Estate Underwriting Standards vs. RRE Net Charge-offs



Source: Federal Reserve

Figure 10: Residential Real Estate Loan Demand vs. Loan Growth

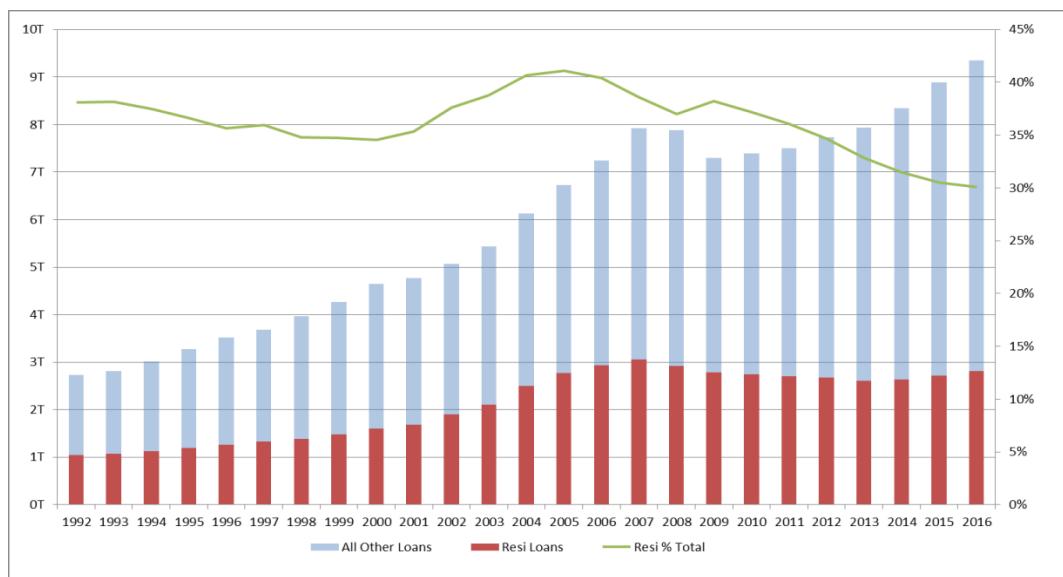


Source: Federal Reserve

There was a special question from the SLOOS survey regarding the current level of lending standards vs. the midpoint range going back to 2005. Given the financial crisis, the lending standards for RRE remained somewhat tighter than the midpoints of the ranges since 2005. Subprime residential mortgages remained the category that was most consistently reported as tighter than its respective midpoint. Consequently, residential real estate loans as a percentage of total loans declined from a peak of 41% in 2005 to 30% in 2016, the lowest level going back to 1992. Importantly, RRE lending has resumed growth, on absolute basis, starting in 2014 after peaking in 2007 (Figure 11).

Bottom line: banks are well positioned to grow its mortgage loan portfolio and take advantage of a potentially expanding mortgage market as the mortgage concentration is at historically low levels while credit metrics remain excellent and more banks are willing to portfolio RRE loans to drive overall loan growth.

Figure 11: RRE Loan as a percentage of Total Loans for all FDIC Banks



Source: FDIC

Figure 12: Federal Reserve H.8 Data

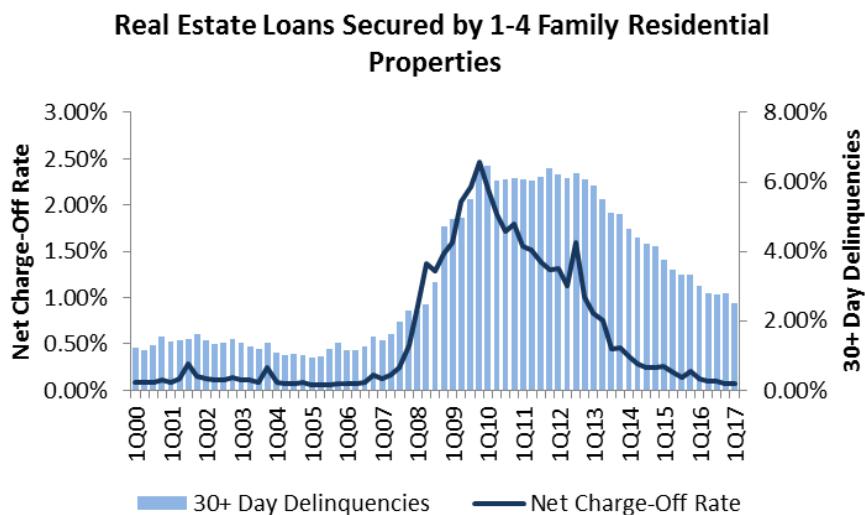
H8 Data-All Banks	2005	2014	2015	2016	July-17	09-13 CAGR	13-16 CAGR
Home Equity LOC	\$445	\$457	\$436	\$406	\$389	-5.9%	-5.0%
Residential RE	\$1,208	\$1,582	\$1,657	\$1,750	\$1,779	0.5%	3.9%
Commercial RE	\$1,277	\$1,616	\$1,791	\$1,968	\$2,048	-2.1%	9.4%
Total RE	\$2,930	\$3,656	\$3,884	\$4,125	\$4,215	-1.6%	5.2%
Total Loans	\$7,368	\$11,000	\$11,790	\$12,534	\$12,655	3.1%	7.1%
Mix						Avg	Avg
RE Loans/total loans	53.0%	45.5%	44.8%	44.8%	45.4%	51.2%	45.7%
Resd RE Loans/total loans	21.8%	19.7%	19.1%	19.0%	19.1%	22.1%	19.7%
CRE/Total Loans	23.1%	20.1%	20.7%	21.4%	22.0%	21.3%	20.6%
Y/Y Growth							
Revolving home equity loans	11.9%	-3.3%	-0.9%	-6.8%	-7.3%		
Resd. RE	12.2%	1.3%	1.7%	5.6%	3.7%		
Commercial real estate loans	17.7%	7.6%	2.8%	9.9%	7.8%		
Real estate loans	14.5%	3.3%	1.9%	6.2%	4.5%		
Commercial & industrial loans	14.2%	12.3%	2.9%	7.1%	2.0%		
Consumer loans	-0.1%	6.4%	4.2%	7.5%	3.7%		
Total Loans	13.6%	7.9%	2.5%	6.1%	3.6%		
Resd RE Growth/Total LG	0.90x	0.16x	0.70x	0.92x	1.03x	0.16x	0.54x

Source: Federal Reserve

RRE loan portfolios with non-QM characteristics are growing as more banks focus on expanding its private banking business. Banks are willing to portfolio jumbo mortgages, especially those that can be the basis of an important customer relationship. Although underwriting a non-QM product is more cumbersome, refinancing a \$600,000 mortgage against a coastal-suburban home, with an LTV under 60%, to a high-net-worth entrepreneurial borrower, tends to be low risk.

It is also worth noting that credit metrics in bank ILC portfolios are moving back to pre-crisis lows and expected to improve.

Figure 13: 1-4 Family Residential Delinquencies and Net Charge-offs



Source: FDIC

Mortgage Originations and Other Active Submarkets for Banks

There are a number of areas of the mortgage equation where banks operate with clear complete advantages over independent and more wholesale players. Non agency prime Jumbo lending requires the ability to fund and hold mortgages without distress and providing access warehouse lending to independents is another area of note. Finally, there are a number of banks where mortgage origination and servicing revenue play a major role in the revenue equation. The next three exhibits look at these three areas.

PHH is shutting down its private label business and has sold its joint venture with Realogy (RLGY). We are assuming that this volume moves back to Lender Live, Guarantee Rate, or the initiating banks.

Figure 14: Top 12 Originators-Non Agency Jumbo

Rank	Originator	Non-Agency Jumbo Loans		Resd. RE Loans 06/17		
		Vol-1Q17	M Share	\$	% of loans	y/y growth
1	Chase	Bnk	\$10.9	44.7%	\$189.7	21%
2	Wells Fargo	Bnk	\$9.6	39.3%	\$319.3	33%
3	Bank of America	Bnk	\$7.6	31.1%	\$197.4	22%
4	PHH Mortgage	Ind	\$4.1	16.8%	x	x
5	US Bank	Bnk	\$2.6	10.7%	\$58.8	21%
6	1st Republic	Bnk	\$2.4	9.8%	\$36.5	63%
7	MUFG Union Bank	Bnk	\$2.4	9.8%	\$32.5	41%
8	Citi	Bnk	\$1.8	7.4%	\$11.0	2%
9	SunTrust	Bnk	\$1.3	5.3%	\$27.1	19%
10	Redwood Trust	M REIT	\$1.1	4.5%	\$3.9	100%
11	Guarantee Rate	Ind	\$1.0	4.1%	x	x
12	Citizens	Bnk	\$0.8	3.3%	\$16.1	15%
	Others		\$24.4	100.0%	na	na
	Est. Total Market		\$70.0	286.9%		

Source: Inside Mortgage Finance and SNL

Figure 15: Warehouse Lending Commitments

Warehouse Lenders Ranked by Commitments (Dollars in billions)			
Rank	Lender	Rank	
1	J.P. Morgan Chase	\$9.0	15.3%
2	Wells Fargo	\$5.6	9.5%
3	Comerica	\$4.0	6.8%
4	EverBank	\$4.0	6.8%
5	BB&T	\$3.7	6.2%
6	CustomersBank	\$3.5	6.0%
7	Texas Capital	\$3.4	5.7%
8	First Tennessee	\$3.4	5.7%
9	Santander Bank	\$2.6	4.4%
10	Flagstar Bank	\$2.5	4.2%
11	U.S. Bancorp	\$2.0	3.5%
12	People's United	\$2.0	3.4%
	Others	<u>\$13.4</u>	<u>22.7%</u>
	Market Total:	\$59.0	100.0%

Source: Inside Mortgage Finance

Figure 16: Relative Contribution of Mortgage Banking and Servicing

Year to Date 2017						
Rank	Company	Ticker	Mkt Cap \$B	Total Assets-\$B	Mort. Rev/NII+NIR	
1	HomeStreet Inc	HMST	\$0.7	\$6.2	58.3%	
2	Flagstar Bancorp	FBC	\$1.8	\$14.1	36.7%	
3	Hilltop Hldgs Inc	HTH	\$2.5	\$12.7	33.7%	
4	TowneBank	TOWN	\$1.9	\$8.0	17.5%	
5	Berkshire Hills	BHLB	\$1.4	\$9.2	14.6%	
6	Ameris Bancorp	ABCB	\$1.7	\$6.9	14.2%	
7	MB Financial Inc	MBFI	\$3.3	\$19.3	12.1%	
8	Umpqua Hldgs Corp	UMPQ	\$3.9	\$24.8	11.7%	
9	Renaissance Corp	RNST	\$2.0	\$8.7	10.9%	
10	Wintrust Financial	WTFC	\$4.1	\$25.7	10.4%	
11	Trustmark Corp	TRMK	\$2.1	\$13.4	10.3%	
12	United Bkshs Inc	UBSI	\$3.5	\$14.5	7.7%	
13	Wells Fargo & Co	WFC	\$262	\$1,930	7.4%	
14	BOK Financial Corp	BOKF	\$5.3	\$32.8	7.4%	
15	IBERIABANK	IBKC	\$4.2	\$21.7	7.4%	
16	SunTrust Banks Inc	STI	\$28	\$205	7.0%	
17	First Inter BancSys	FIBK	\$2.0	\$9.1	6.7%	
18	Heartland Finl USA	HTLF	\$1.3	\$8.2	5.8%	
19	Glacier Bancorp	GBCI	\$2.7	\$9.5	6.3%	
20	M&T Bank Corp	MTB	\$24.1	\$123	6.2%	

Mortgage revenue = net servicing plus GOS revenue primarily from the sale of 1-4 single mortgages; also includes multi-family sales

Source: SNL, Wedbush Securities Inc.

Non-QM, A bigger Tent than Subprime

This is not, as the non-QM originators we talk with emphasize, the pre-crisis, sub-prime/non-agency market of yesteryear nor is it a pool of NINJA loans hoping that rising HPA bails out loan quality. Without the safe harbor made available from the GSE/GOV market and the requirement for mortgage banks to have “skin in the game” in their securitization, the documentation and underwriting bar for non-QM lenders is exceptionally high and these mortgages are being carefully scrutinized by all the parties holding this risk.

Figure 17: Relative Contribution of Mortgage Banking and Servicing

Issuer	VERUS	GFMT	AOMT	SGRMT	DRMT	COLT	DRMT
Issue	2017-1	2017-1	2017-1	2017-1	2017-1	2017-1	2017-2
Closing Date	2/22/2017	3/8/2017	3/10/2017	3/28/2017	4/13/2017	5/3/2017	6/13/2017
KBRA Rated (Y/N)	Y	N	N	N	N	Y	Y
Closing Pool \$ mm's	\$145	\$255	\$146	\$120	\$221	\$403	\$250
Avg Loan Size-\$ 000's	\$501.8	\$701.3	\$276.9	\$581.9	\$309.3	\$472.0	\$384.2
Weighted Avg							
WA Orig LTV	69.9%	66.9%	76.1%	72.6%	74.9%	76.1%	73.9%
LTV > 80%							15.4%
WA FICO	708	753	698	709	682	713	685
ARM %	91.8%	6.7%	85.0%	67.2%	68.3%	74.1%	75.8%
I/O %	5.8%	6.1%	9.8%	7.7%	6.1%	2.8%	4.1%
Full Doc	37.9%	78.6%	47.3%	80.3%	82.3%	78.3%	62.6%
24 month bank statements	59.5%	10.2%	21.8%	18.4%	17.7%	0.0%	35.0%
WA - DTI	35.2%	31.8%	37.4%	37.9%	35.0%	39.6%	35.2%
Negative Credit Event	33.2%	9.1%	na	na	51.4%	30.0%	44.4%

Source: Kroll Bond Rating Agency

There are a number of major sub-products that non-QM originators are focused on outside of the subprime box. In addition to a small sliver of subprime, non-QM originators focus on a broad range of FICO scores and products including: 1) "near miss"-This is exactly what it sounds like, a borrower with most of the criteria in place for a conventional mortgage, 2) mortgages with non-traditional forms of income verification (usually bank statements), and 3) high end borrowers needing a customized mortgage product, that does not fit what the CFPB believes to be "safe." Data from Deephaven's recent securitizations is indicative of FICO range and loan characteristics.

Figure 18: Deephaven Residential Mortgage Trust 2017-2 Profile

Original Credit Score	Percent of Pool	Median Income	Original LTV	Coupon	Owner Occupied %
<=600	6.6%	\$85,480	62.9%	8.58%	100.0%
> 600- 620	1.7%	\$140,463	66.7%	8.18%	96.3%
> 620- 640	6.8%	\$113,364	68.2%	7.33%	98.5%
> 640- 660	9.1%	\$124,846	76.6%	7.32%	88.1%
> 660- 680	14.1%	\$136,670	75.2%	6.71%	97.7%
> 680- 700	22.6%	\$146,504	75.1%	6.68%	88.5%
> 700- 720	18.3%	\$145,802	76.3%	6.43%	90.9%
> 720- 740	9.5%	\$184,186	76.3%	6.15%	88.8%
> 740- 760	2.9%	\$135,195	79.4%	6.68%	89.9%
> 760- 780	3.1%	\$204,025	70.3%	6.19%	75.6%
> 780- 800	2.2%	\$147,232	70.3%	6.12%	86.4%
> 800	0.7%	\$82,293	77.4%	6.17%	75.2%

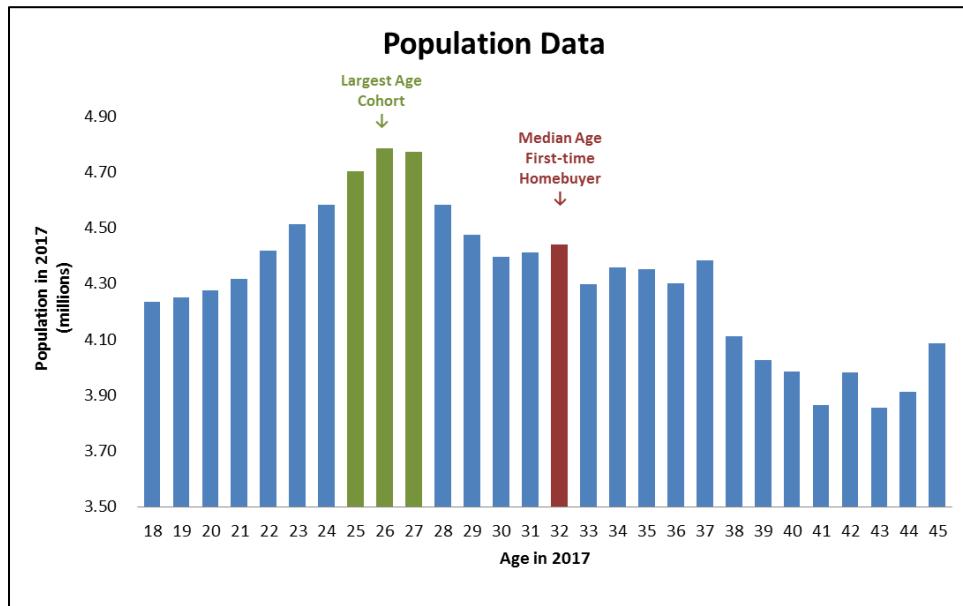
Source: Kroll Bond Rating Agency

In 2016 the market funded ~\$845 million in non-QM securitizations and in 2017 the expectation is for something between \$2-3 billion in volume. The rest of this market is being funded by bank buyers and institutional investors who are buying whole loans. Morgan Stanley (MS) is said to be the largest of these along with private investment funds.

New Cohorts

The next two waves of new cohorts about to cross into “home ownership” (median age of a first time home buyer is 32) are significantly larger than anything seen in the last 15. The current 25-29 cohort represents 23.5 million first time or move up home buyers. This is 1.2x the size of the preceding group (30-35 year olds). In addition, we would note that that the home ownership rate of this group is less than 35%, vs. the > 60% for the 40-45 year old age group.

Figure 19: Relative Contribution of Mortgage Banking and Servicing



Source: United States Census Bureau

According to the US Census Bureau's 2016 Current Population Survey; from 2015 to 2016 the most commonly cited reason for moving among persons in the 25-29 and 30-44 year-old age groups was housing related. Whether this be related directly to costs is unclear but our view is that, in the latter group, of 30-44 year old persons there is a strong fundamental demand for increased living space near educational resources that are highly valued by newly created families with young children.

Figure 20: 2016 Migration Data: Reasons for Move

United States	Total	Family-related reason	Employment-related reason	Housing-related reason	Other reason
MOVERS 1+ years/1	35,138	9,645	7,087	14,823	3,583
SEX					
Male	17,449	4,582	3,744	7,367	1,756
Female	17,689	5,064	3,343	7,456	1,827
AGE					
Under 16 years	8,018	2,278	1,349	3,878	513
16 to 19 years	1,785	454	316	728	286
20 to 24 years	5,064	1,538	992	1,700	834
25 to 29 years	5,388	1,505	1,347	1,975	561
30 to 44 years	7,873	1,930	1,820	3,586	537
45 to 64 years	5,512	1,559	1,056	2,405	492
65 to 74 years	896	236	134	355	172
75+ years	602	146	73	195	188

Source: U.S. Census Bureau, Wedbush Securities Inc.

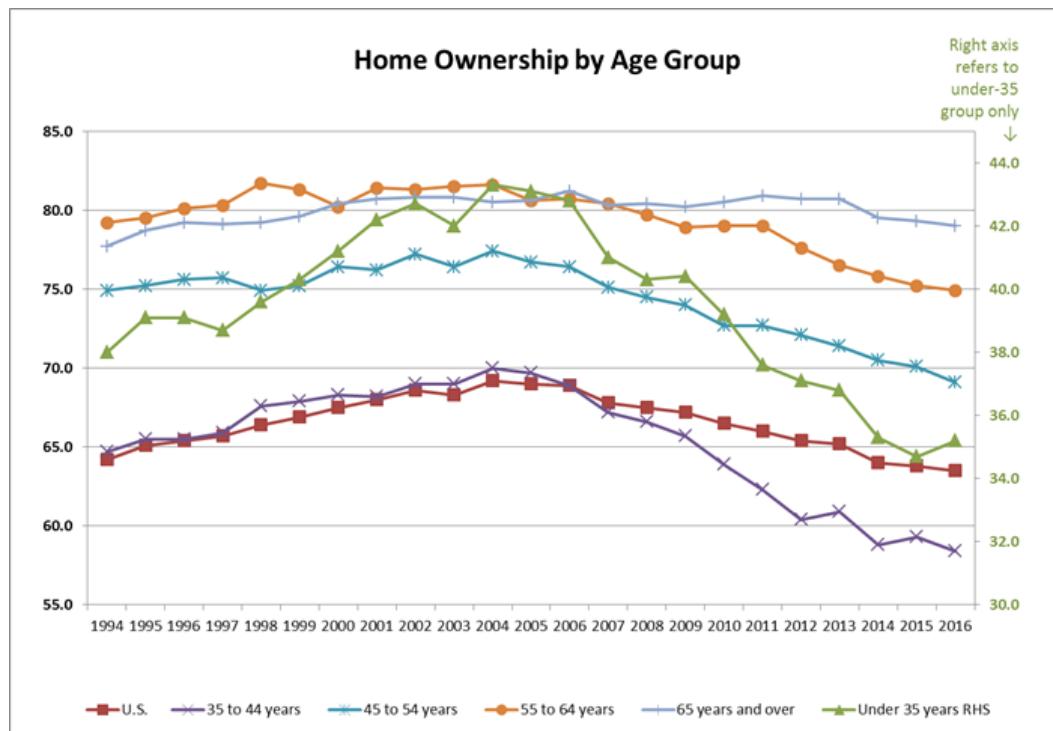
This is further supported when we think about the cost and availability of housing within urban centers as opposed to suburban communities. Over the same period we can see that the net metro/non-metro migration in these age groups is relatively small while the movement from principal city to suburb is magnitudes greater, indicating persons moving out of the young adulthood phase are seeking property in areas more suited for homeownership than rental housing.

Figure 21: 2016 Net Domestic Migration

Net domestic migration	Metro net migration	Nonmetro net migration/1	Principal city net migration	Suburb net migration
TOTAL 1+ years	197	-197	-2,009	2,206
SEX				
Male	130	-130	-985	1,115
Female	66	-66	-1,025	1,091
AGE				
1 to 4 years	26	-26	-299	325
5 to 9 years	2	-2	-197	199
10 to 14 years	19	-19	-168	186
15 to 19 years	-17	17	-70	53
20 to 24 years	28	-28	-191	219
25 to 29 years	24	-24	-315	339
30 to 44 years	30	-30	-492	522
45 to 64 years	48	-48	-283	331
65 to 74 years	19	-19	-15	34
75+ years	18	-18	19	-1

Source: U.S. Census Bureau, Wedbush Securities Inc.

Figure 22: U.S. Home Ownership by Age



Source: U.S. Census Bureau, Wedbush Securities Inc.

From what we can see from US census bureau data, broader migration patterns have certainly had an impact on the homeownership rate of millennials. Overwhelmingly for the first half of this decade, they have tended to settle in the higher cost areas, whether out of personal preference or for employment opportunities. This migration tends to account for the lack of available inventory for this group—any *affordable* inventory simply does not exist. Two forces that appear to be reversing this trend are the aforementioned movement away from city centers due to the aging of millennials toward childbearing age, and improving incomes.

Figure 23: Urban Migration

Rank	MSA's Losing 20-45YO Population 2010-15	2015 Pop	Chg from '10	Housing Price/ Median Income	Mortgage Affordabilit y	Rental Affordabilit y	Inventory	Inventory/ Populati on Ratio
1	Chicago-Naperville-Elgin, IL-IN-WI Metro Area	3,944,195	(53,922)	3.11	13.3%	30.3%	40359	1.023%
2	Detroit-Warren-Dearborn, MI Metro Area	1,630,474	(34,761)	2.37	10.1%	25.4%	15978	0.980%
3	St. Louis, MO-IL Metro Area	1,085,553	(26,439)	2.51	10.7%	23.1%	12585	1.159%
4	Springfield, MA Metro Area	259,745	(20,978)	3.71	15.9%	32.8%	1894	0.729%
5	Dayton, OH Metro Area	303,545	(20,360)	2.09	9.0%	21.8%	3146	1.036%
6	Toledo, OH Metro Area	242,382	(18,026)	2.12	9.1%	23.6%	2500	1.031%
7	Providence-Warwick, RI-MA Metro Area	632,323	(9,877)	4.21	18.0%	31.4%	6185	0.978%
8	Cleveland-Elyria, OH Metro Area	760,439	(9,667)	2.47	10.6%	26.1%	9963	1.310%
9	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area	2,403,671	(8,809)	3.15	13.5%	28.2%	27479	1.143%
10	Scranton--Wilkes-Barre-Hazleton, PA Metro Area	202,614	(8,489)	2.20	9.4%	22.3%	3123	1.541%
11	Youngstown-Warren-Boardman, OH-PA Metro Area	191,360	(7,451)	1.89	8.1%	21.4%	2891	1.511%
12	New Haven-Milford, CT Metro Area	336,912	(7,420)	3.40	14.6%	30.8%	4478	1.329%
13	Louisville/Jefferson County, KY-IN Metro Area	500,220	(6,965)	2.59	11.1%	24.8%	4300	0.860%
14	Syracuse, NY Metro Area	256,918	(6,859)	2.09	9.0%	27.6%	2674	1.041%
15	Pittsburgh, PA Metro Area	861,214	(5,934)	2.37	10.2%	23.5%	11522	1.338%
16	Birmingham-Hoover, AL Metro Area	451,385	(5,851)	2.42	10.4%	23.9%	6267	1.388%
17	Milwaukee-Waukesha-West Allis, WI Metro Area	622,420	(5,149)	3.54	15.2%	26.9%	3990	0.641%
18	Richmond, VA Metro Area	510,999	(4,880)	3.18	13.7%	25.9%	4552	0.891%
19	Memphis, TN-MS-AR Metro Area	545,490	(4,840)	2.30	9.9%	25.7%	4481	0.821%
20	Cincinnati, OH-KY-IN Metro Area	846,457	(4,691)	2.50	10.7%	25.3%	7058	0.834%
21	Akron, OH Metro Area	271,134	(3,720)	2.41	10.3%	25.5%	3075	1.134%
22	Hartford-West Hartford-East Hartford, CT Metro Area	468,782	(3,057)	2.92	12.5%	25.9%	6014	1.283%
23	Buffalo-Cheektowaga-Niagara Falls, NY Metro Area	432,523	(2,258)	2.53	10.8%	26.4%	2848	0.658%
24	Harrisburg-Carlisle, PA Metro Area	213,007	(2,072)	2.72	11.7%	25.0%	2477	1.163%
25	Allentown-Bethlehem-Easton, PA-NJ Metro Area	307,129	(1,996)	2.89	12.4%	27.2%	4388	1.429%
	Median			2.51	10.7%	25.7%		1.041%
	Mean			2.71	11.6%	26.0%		1.090%

Source: US Census Bureau, Zillow, Wedbush Securities Inc.

Figure 24: Top Millenial MSA's

Rank	MSA	% in Age Group	25-44Y Population	% of US Group	Cumulative Total	Median Price/ Income	Inventory
1	New York-Newark-Jersey City, NY-NJ-PA Metro Area	27.8	5,610,681	6.6%	6.6%	5.5	81,911
2	Los Angeles-Long Beach-Anaheim, CA Metro Area	29	3,868,620	4.6%	11.2%	8.9	20,398
3	Chicago-Naperville-Elgin, IL-IN-WI Metro Area	27.7	2,645,380	3.1%	14.3%	3.1	40,359
4	Dallas-Fort Worth-Arlington, TX Metro Area	29	2,059,628	2.4%	16.8%	3.1	14,932
5	Houston-The Woodlands-Sugar Land, TX Metro Area	29.4	1,957,142	2.3%	19.1%	2.8	25,396
6	Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	29.7	1,811,190	2.1%	21.2%	3.9	19,511
7	Atlanta-Sandy Springs-Roswell, GA Metro Area	28.3	1,615,854	1.9%	23.1%	2.7	31,194
8	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area	26.4	1,602,447	1.9%	25.0%	3.2	27,479
9	Miami-Fort Lauderdale-West Palm Beach, FL Metro Area	26.6	1,599,280	1.9%	26.9%	4.7	44,683
10	San Francisco-Oakland-Hayward, CA Metro Area	30.4	1,415,464	1.7%	28.6%	8.9	4,797
11	Boston-Cambridge-Newton, MA-NH Metro Area	27.3	1,303,390	1.5%	30.2%	5.0	10,195
12	Phoenix-Mesa-Scottsdale, AZ Metro Area	27.3	1,248,847	1.5%	31.6%	3.9	22,622
13	Riverside-San Bernardino-Ontario, CA Metro Area	27	1,212,073	1.4%	33.1%	5.5	17,222
14	Seattle-Tacoma-Bellevue, WA Metro Area	30.3	1,131,275	1.3%	34.4%	5.2	8,172
15	Detroit-Warren-Dearborn, MI Metro Area	24.9	1,071,209	1.3%	35.7%	2.4	15,978
16	Minneapolis-St. Paul-Bloomington, MN-WI Metro Area	27.8	979,834	1.2%	36.8%	3.2	11,908
17	San Diego-Carlsbad, CA Metro Area	29.3	966,760	1.1%	38.0%	7.5	6,987
18	Denver-Aurora-Lakewood, CO Metro Area	30.7	863,999	1.0%	39.0%	4.7	6,712
19	Tampa-St. Petersburg-Clearwater, FL Metro Area	25.3	752,732	0.9%	39.9%	3.5	17,256
20	Baltimore-Columbia-Towson, MD Metro Area	26.9	752,502	0.9%	40.8%	3.4	13,034
21	St. Louis, MO-IL Metro Area	25.9	728,389	0.9%	41.6%	2.5	12,585
22	Portland-Vancouver-Hillsboro, OR-WA Metro Area	29.6	707,512	0.8%	42.5%	5.2	5,875
23	Orlando-Kissimmee-Sanford, FL Metro Area	28.5	680,334	0.8%	43.3%	3.7	11,502
24	Charlotte-Concord-Gastonia, NC-SC Metro Area	27.8	674,529	0.8%	44.1%	3.0	8,938
25	San Antonio-New Braunfels, TX Metro Area	28	666,912	0.8%	44.9%	2.8	7,978

Source: US Census Bureau, Zillow, Wedbush Securities Inc.

The Big Picture – market dynamics since 2000

Our views on the evolution of the mortgage market are grounded in the consensus view on housing, reflected in the first exhibit in this section, which calls for a mortgage market of about \$1.6 trillion in originations per year as well as a look back at mortgage over the last 15+ years. Some basic observations: 1) we think the mortgage market is bigger than that suggested by the consensus housing outlook, and while our estimated boost is not large compared to the total, our intuition is that a disproportionate percentage of this growth falls on the shoulders of a narrow group of companies. 2) the mortgage market has been much bigger than it is today before, and 3) it's been bigger when rates were higher and affordability factors less attractive. Affordability is an issue, but its counterweight, rising rental costs, can be enough to push renters into being home owners.

Figure 25: Housing Outlook

Housing Consensus	Units	2016A	2017E	2018E	16A Δ	17E Δ	18E Δ
Starts							
Single Family	K's #	783	870	952	9.7%	11.0%	9.4%
Multifamily	K's #	<u>392</u>	<u>373</u>	<u>371</u>	<u>-0.9%</u>	<u>-5.0%</u>	<u>-0.5%</u>
Total Housing Starts	K's #	1,175	1,242	1,322	5.9%	5.7%	6.4%
Home Sales							
New Single Family Sales	K's #	560	626	692	11.7%	11.8%	10.5%
Existing Home Sales	K's #	<u>5,292</u>	<u>5,465</u>	<u>5,618</u>	<u>3.9%</u>	<u>3.3%</u>	<u>2.8%</u>
Total Home Sales	K's #	5,852	6,091	6,310	4.6%	4.1%	3.6%
Home Prices							
Median New Price	K \$	\$312	\$321	\$330	5.1%	2.8%	2.9%
Median Existing Price	K \$	\$233	\$244	\$253	5.4%	4.9%	3.6%
Rates							
30-Yr Fixed Mortgage	rate	3.71%	4.27%	4.59%	-0.17%	0.56%	0.32%
3Yr ARM Mortgage	rate	2.87%	3.22%	3.82%	0.35%	0.35%	0.60%
Mortgage Volumes							
Purchase	bil \$	\$1,026	\$1,085	\$1,171	13%	6%	8%
Refinance	bil \$	<u>\$946</u>	<u>\$562</u>	<u>\$408</u>	<u>18%</u>	<u>-41%</u>	<u>-27%</u>
Mortgage Origination		\$1,972	\$1,647	\$1,579	15%	-16%	-4%

Consensus reflects average of FNMA, FHLMC, MBA, NAR and NAHB forecasts

Aug-17

Source: Wedbush Securities Inc. estimates, reporting entities

Figure 26: New Foreclosures by State

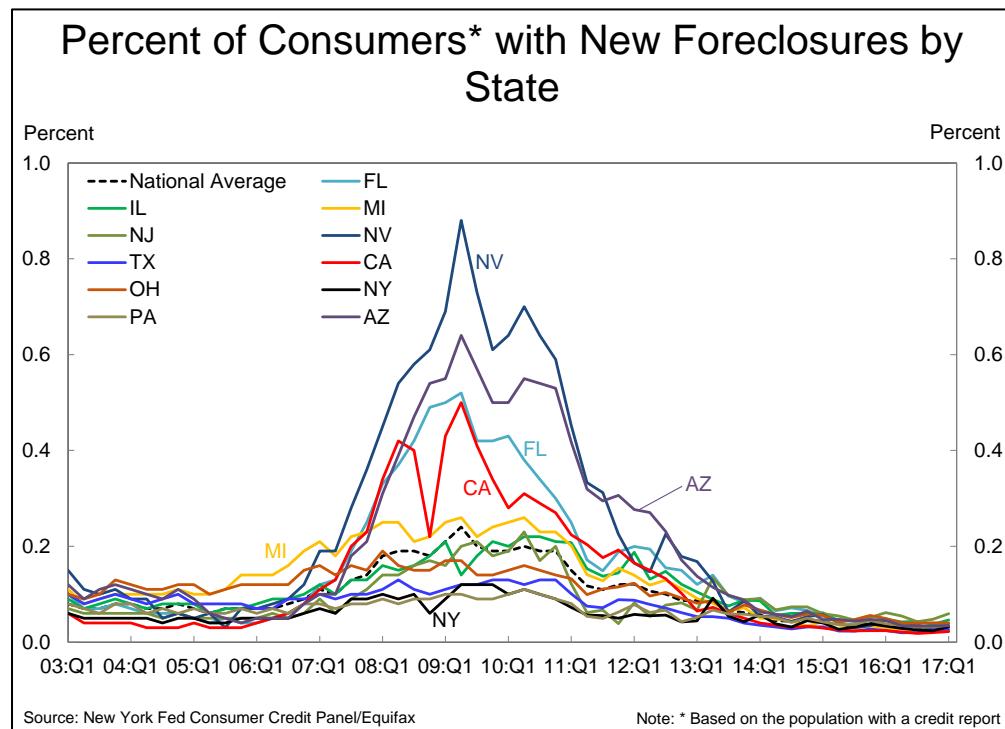


Figure 27: 90+ Mortgage Delinquencies

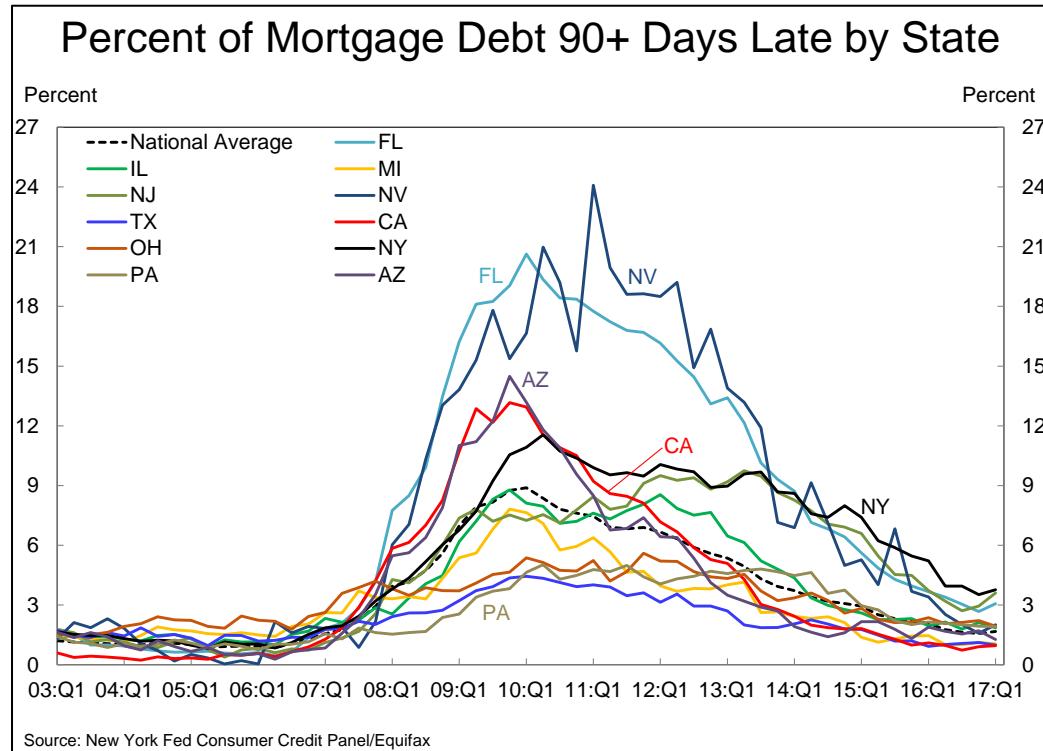


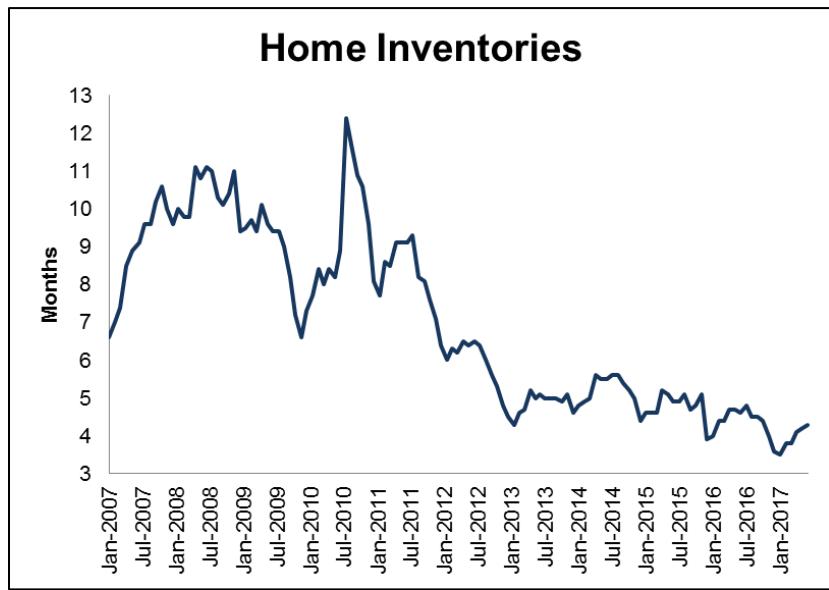
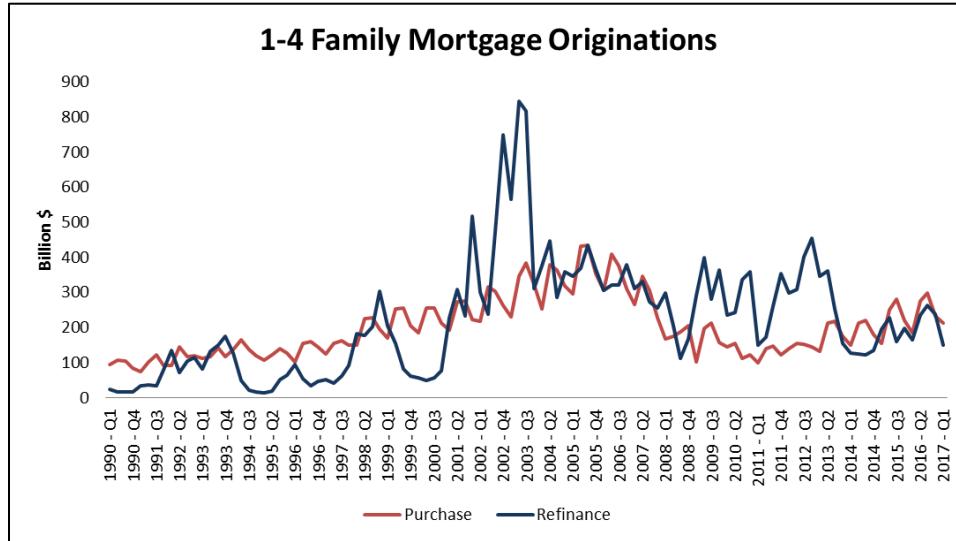
Figure 28: Inventories

Source: Mortgage Bankers Association
Figure 29: MBA Quarterly Originations

Source: Mortgage Bankers Association

Figure 30: Annual Originations 1-4 Family Mortgages

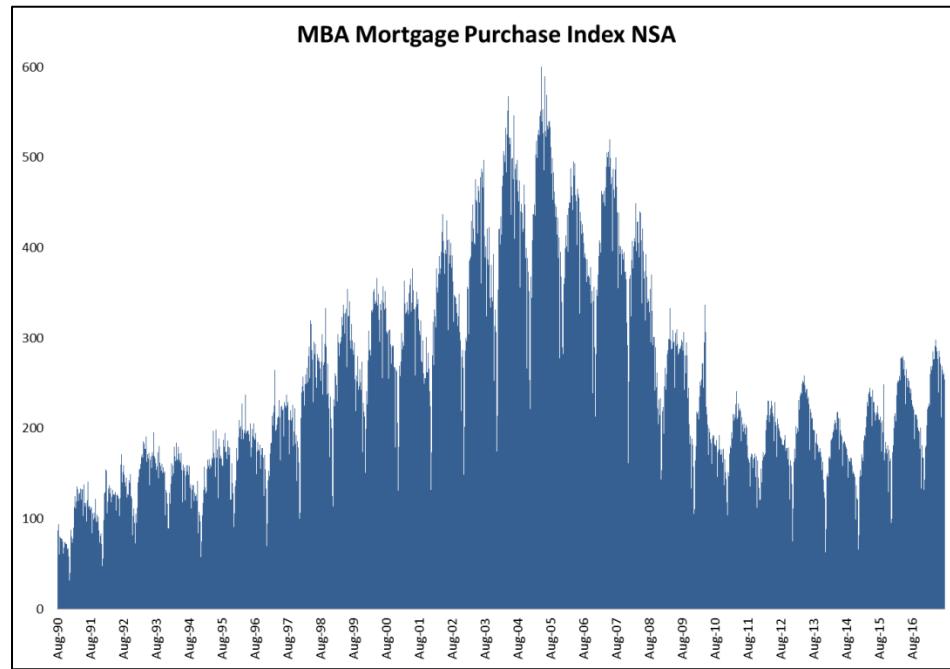
This is the same data as figure 28, reflected on a full-year basis

Yr		Mix			PM	RF	Total
		Purch.	Refi.	Total			
2017	E	\$1,084	\$528	\$1,612	67%	33%	100%
2016	A	\$990	\$901	\$1,891	52%	48%	100%
2015	A	\$903	\$776	\$1,679	54%	46%	100%
2014	A	\$760	\$503	\$1,263	60%	40%	100%
2013	A	\$734	\$1,111	\$1,845	40%	60%	100%
2012	A	\$587	\$1,456	\$2,044	29%	71%	100%
2011	A	\$505	\$931	\$1,436	35%	65%	100%
2010	A	\$530	\$1,168	\$1,698	31%	69%	100%
2009	A	\$664	\$1,331	\$1,995	33%	67%	100%
2008	A	\$731	\$777	\$1,509	48%	52%	100%
2007	A	\$1,140	\$1,166	\$2,306	49%	51%	100%
2006	A	\$1,399	\$1,326	\$2,725	51%	49%	100%
2005	A	\$1,512	\$1,514	\$3,026	50%	50%	100%
2004	A	\$1,309	\$1,463	\$2,772	47%	53%	100%
2003	A	\$1,280	\$2,532	\$3,812	34%	66%	100%
2002	A	\$1,097	\$1,757	\$2,854	38%	62%	100%
2001	A	\$960	\$1,283	\$2,243	43%	57%	100%
2000	A	\$905	\$234	\$1,139	79%	21%	100%

\$ in Billions

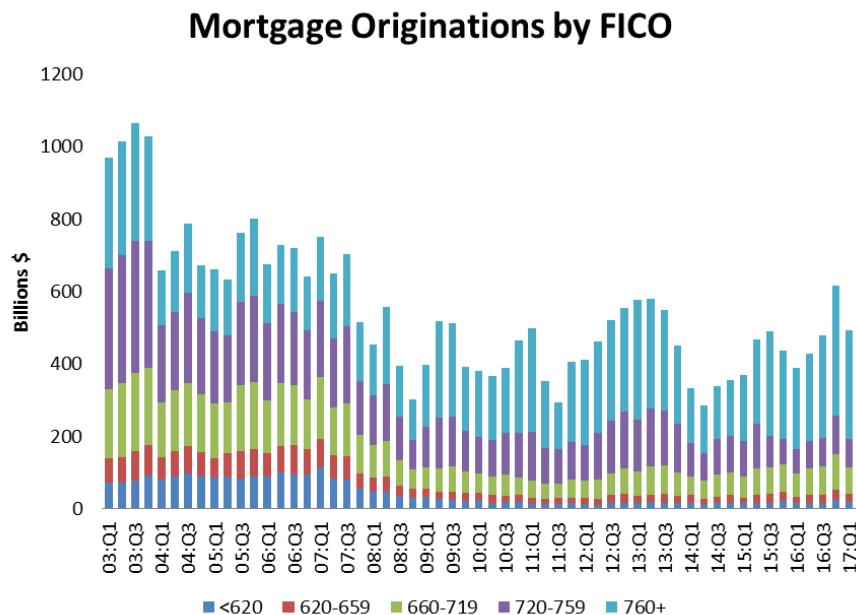
Mortgage Bankers Association

Figure 31: MBA Mortgage Purchase Index NSA



Source: Mortgage Bankers Association

Figure 32: Originations by Risk Score



Source: NY Fed Data

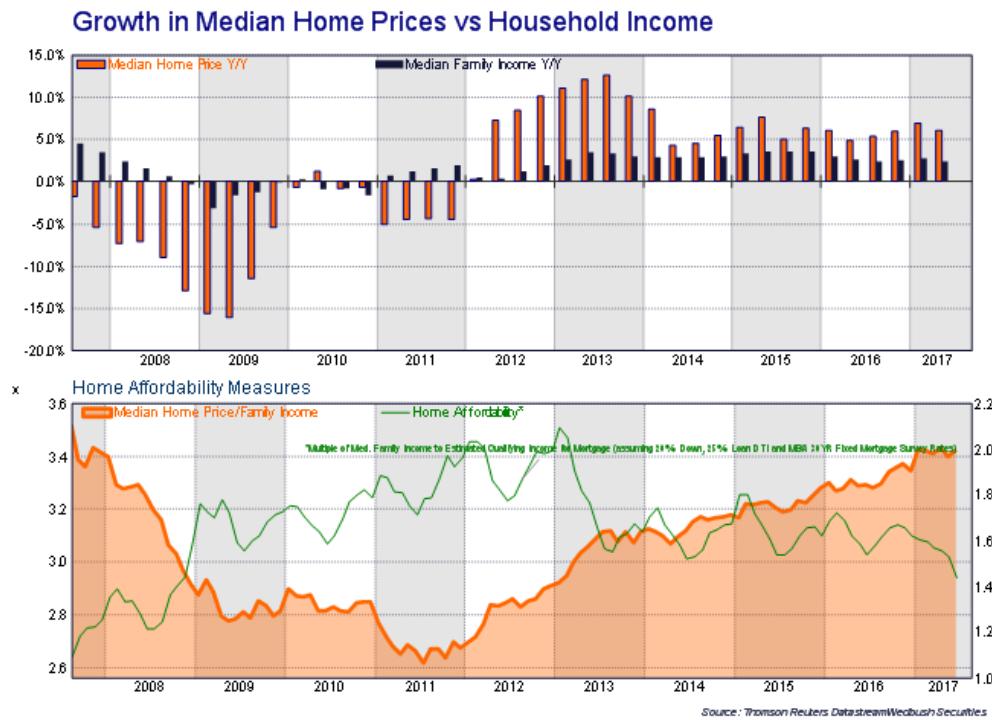
Figure 33: Originations by Product

We include this exhibit as a matter of intellectual honesty. Without what Inside Mortgage Finance has classified as subprime, the 2005-2006 market would not have been much larger than what we say in 2015 or what we are expecting in the years going forward

Period	Mortgage Originations by Product (Dollars in Billions)				Non - prime	TOTAL	1st Lien ex NP	Mix			
	GOV	Conf	Jumbo	1st-Lien				GOV	Conf	Jumbo	NP
1Q17	\$105	\$204	\$70	\$6	\$385	\$379	27%	53%	18%	1.6%	100%
2016	\$545	\$1,117	\$381	\$22	\$2,065	\$2,043	26%	54%	18%	1.1%	100%
2015	\$416	\$967	\$328	\$24	\$1,735	\$1,711	24%	56%	19%	1.4%	100%
2014	\$277	\$767	\$235	\$21	\$1,300	\$1,279	21%	59%	18%	1.6%	100%
2013	\$366	\$1,174	\$272	\$18	\$1,830	\$1,812	20%	64%	15%	1.0%	100%
2012	\$390	\$1,438	\$225	\$23	\$2,076	\$2,053	19%	69%	11%	1.1%	100%
2011	\$294	\$963	\$170	\$18	\$1,445	\$1,427	20%	67%	12%	1.2%	100%
2010	\$377	\$1,092	\$104	\$8	\$1,581	\$1,573	24%	69%	7%	0.5%	100%
2009	\$451	\$1,201	\$97	\$10	\$1,759	\$1,749	26%	68%	6%	0.6%	100%
2008	\$293	\$928	\$98	\$65	\$1,384	\$1,319	21%	67%	7%	4.7%	100%
2007	\$116	\$1,151	\$348	\$466	\$2,081	\$1,615	5.6%	55%	17%	22%	100%
2006	\$80	\$990	\$480	\$1,000	\$2,550	\$1,550	3.1%	39%	19%	39%	100%
2005	\$90	\$1,090	\$570	\$1,005	\$2,755	\$1,750	3.3%	40%	21%	36%	100%
2004	\$135	\$1,210	\$515	\$730	\$2,590	\$1,860	5.2%	47%	20%	28%	100%

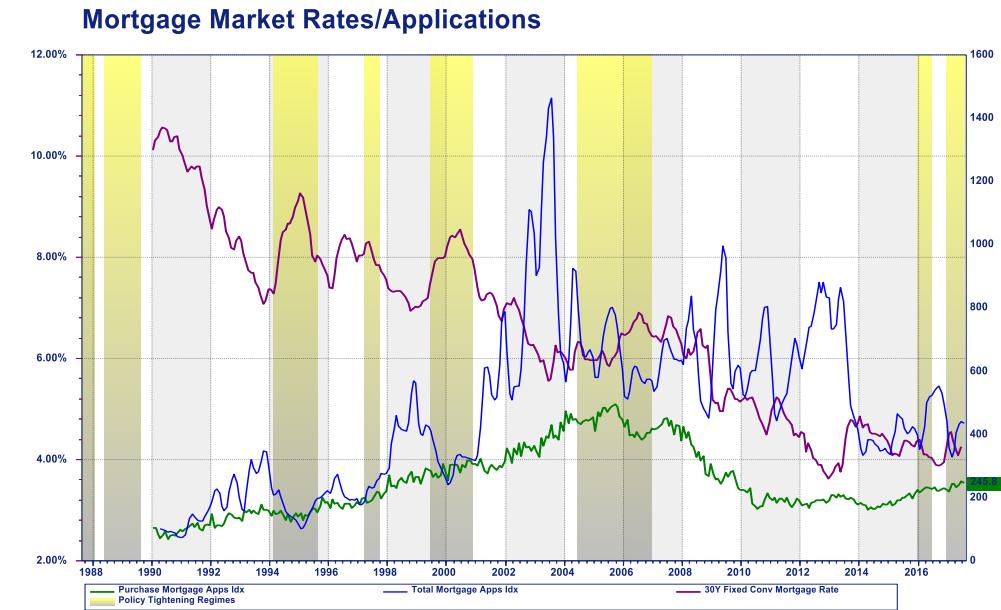
Source: Inside Mortgage Finance and Wedbush Securities Inc.

Figure 34: Home Affordability and Mortgage Volumes



Source: Bloomberg

Figure 35: Mortgage Rates and Volumes



Source: Bloomberg

A Short Primer on Mortgage

In many respects mortgage and housing finance (as well as its counterparts: multi-family lending and single family rentals) are very simple businesses. Some parties make loans and others are in the originate/sell (and for many, service) business. Loan products include everything from a residential mortgage held on the balance sheet to a wide range of commercial products including warehouse lines, construction and financing, and interim or long-term direct mortgages. These are generally held by banks or REITs. Our focus is on the originate and service business.

Mortgage Origination

Mortgage originators are transactional companies not looking to hold closed loans for long. Gain on sale is the value or premium received on the sale of closed loans. The value of mortgage servicing, whether captured in the actual sale of the servicing (loans sold servicing released) or in a fair value mark, can be a large portion of the related revenue and with correspondent lenders (the wholesale end of the food chain, buys closed loans), the principal value created in the transaction. Under GAAP accounting, the expected value of the loan sale is recorded based on commitments to lend, or net LOCK (IRLCs-interest rate locks expected to close) while most of the direct cost associated with a mortgage is borne during the closing process. During the closing process, mortgage companies commit to a specific rate, and included in the gain on sale calculation is the fair value marks and hedging cost borne during this phase. NSM is illustrative of what a primarily retail or direct originated would look like and PMT is a pure correspondent. The direct cost figures are from the reported financials and exclude any identified corporate overhead allocations.

Figure 36: Origination Dynamics and Profitability (Retail vs. Correspondent)

FY16	NSM			PMT		
	Rev	IRLCs	Orig	Rev	IRLCs	Orig
Priced in margin		\$ 20,470	\$20,316		\$ 24,967	\$23,959
Gain/loss on mortgage loans sold	\$462.0	2.26%	2.27%	-\$229.7	-0.92%	-0.96%
MSR received	\$197.0	0.96%	0.97%	\$275.1	1.10%	1.15%
Cash-hedge	✗	✗	✗	<u>\$30.9</u>	<u>0.12%</u>	<u>0.13%</u>
Total	\$659.0	3.22%	3.24%	\$76.3	0.31%	0.32%
R&W Provision	x	x	x	-\$3.3	-0.01%	-0.01%
Reduction in R&W liability	\$6.0	0.03%	0.03%	\$7.6	0.03%	0.03%
Hedging and net FV marks	\$14.0	0.07%	0.07%	\$16.6	0.07%	0.07%
Scratch & Dent FV	✗	✗	✗	✗	✗	✗
Total Gain on Sale	<u>\$679.0</u>	<u>3.32%</u>	<u>3.34%</u>	<u>\$97.2</u>	<u>0.39%</u>	<u>0.41%</u>
Fees	✗	✗	✗	\$9.2	na	na
Total	\$679.0	3.32%	3.34%	\$97.2	0.39%	0.41%
Direct Operating Cost	-\$459.0	-2.24%	-2.26%	-\$89.0	-0.36%	-0.37%
Other Revenue	<u>\$63.0</u>	<u>0.31%</u>	<u>0.31%</u>	<u>\$62.3</u>	<u>0.25%</u>	<u>0.26%</u>
Pre Tax Net (LOB only)	\$283.0	1.38%	1.39%	\$70.5	0.28%	0.29%

NSM: \$59 million of servicing related revenue moved to other rev

PMT: \$9.2 million of orig income from PFSI in other revenue

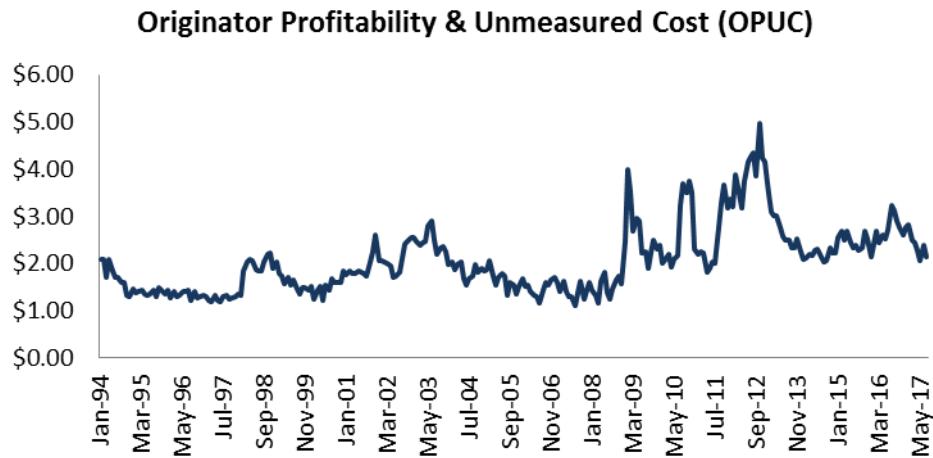
Source: Wedbush Securities Inc., company reports

Banks don't tend to offer up as much detail in their gain on sale calculation and it is important to note that revenue-related results are highly mix dependent. A larger portion of the other revenue reported by both companies is the spread income associated with mortgages held for sale. For most correspondents, the real value in mortgage production is the acquisition of

mortgage servicing rights at a “cash cost” (total revenue less value of MSR received) that while negative, is below what they see as the fair value of the MSRs.

The two primary drivers of profitability in the conventional mortgage market (as well as most other forms of prime lending) are volume and the market implied gain between the rate of the mortgage originated and the market rate of a related securitization or primary secondary spreads, and of course volume. A good inter-quarter proxy for primary and secondary spreads is the NY Fed’s Originator Profitability and Unmeasured Cost Index (OPUC) -includes the value of fees and MSRs and a useful index of expected volumes in the MBA weekly applications index.

Figure 37: Originator Profitability & Unmeasured Cost



Source: Federal Reserve Bank of New York

Figure 38: MBA Application Index

Period	Index Values		Y/Y Change	
	Refinance	Purchase	Purc.	Refi
Week Ending				
08/11/17	1,456	254	-40%	10%
08/04/17	1,433	261	-44%	7%
07/28/17	1,361	260	-41%	9%
07/21/17	1,414	265	-41%	8%
07/14/17	1,368	269	-52%	7%
07/07/17	968	213	-58%	3%
06/30/17	1,391	272	-46%	6%
06/23/17	1,396	265	-35%	8%
06/16/17	1,527	279	-30%	9%
06/09/17	1,495	286	-27%	8%
06/02/17	1,095	240	-34%	6%
05/26/17	1,323	277	-31%	7%
05/19/17	1,402	285	-30%	3%
05/12/17	1,269	290	-36%	9%
05/05/17	1,346	298	-31%	6%
04/28/17	1,302	291	-33%	5%
04/21/17	1,366	277	-34%	0%
04/14/17	1,275	276	-41%	-1%
04/07/17	1,272	285	-40%	3%
Average				
3Q17YTD	1,333	253	-45%	12%
2Q17	1,343	279	-33%	5%
1Q17	1,249	226	-31%	8%
4Q16	1,605	174	3%	2%

Source: Mortgage Brokers Association

Mortgage Servicing

Up until we get to the fair value marks and the cost of financing MSRs, the mortgage servicing business is fairly direct. Servicing companies earn a basic fee—25 bps for conventional GSE product, higher for some other products—which is taken out of the coupon rate of the mortgage (as well as G-fees and other fees where relevant). In exchange for this fee, a mortgage servicer collects monthly mortgage payments, manages escrow and other accounting, disperses funds as required, and manages delinquencies, loss mitigation, and, when required, foreclosures. This last set of items is the most expensive thing a servicer does. Managing delinquent and defaulted loans costs 4-7x what it costs to perform all the other functions and even with GSE/GOV servicing, not all related expense advances are recovered. This is what NSM's three different types of servicing revenues looked like in 2016.

Figure 39: NSM Mortgage Servicing Profitability

NSM FY16	Rev/Cost	Avg Serv
Forward MSR Serv.	UPB B's	\$326.5
Base servicing fees	\$1,000	31bp
Modification fees	\$84	3bp
Incentive fees	\$29	1bp
Late payment fees	\$82	3bp
Other ancillary revenues	\$244	7bp
Other revenues	\$35	1bp
Total forward MSR operational	\$1,474	45bp
Forward MSR amortization	-\$513	-16bp
<u>Excess spread accretion</u>	<u>\$200</u>	<u>6bp</u>
EBIT	\$1,161	36bp
MSR financing liability costs	-\$100	-3bp
<u>Excess spread payments - principal</u>	<u>-\$198</u>	<u>-6bp</u>
Net Forwarding rev, ex FV marks	\$863	26bp
		Avg Serv
Subservicing	UPB B's	\$51.0
Subservicing fees	\$45	9bp
		Avg Serv
Reverse Serv	UPB B's	\$28.5
Serv Fees	\$43.0	15bp
Buyout accretion	\$14.0	5bp
<u>Reverse MSR amortization</u>	<u>\$1.0</u>	<u>0.4bp</u>
Total	\$56.0	19.7bp

Source: Wedbush Securities Inc., company reports

Valuation Statistics

Figure 40: Valuation Table

Period	Symbol	Price 08/23/17	Diluted S/O	Mrkt Cap-\$B\$	Avg Vol \$mm	PE- Consensus EPS			TBV	P/ TBV	Div Yld								
						Cons FY2	18E FY2	19E FY3											
Mortgage																			
<i>Independent Mortgage Companies</i>																			
Nationstar Mortgage Holdings Inc	NSM	\$16.59	98	\$1.6	\$5.5	10.4x	8.8x	7.5x	\$ 16.02	104%	0.0%								
Impac Mortgage Holdings Inc	IMH	\$13.26	21	\$0.3	\$0.7	4.4x	2.9x	na	\$ 8.48	156%	0.0%								
PennyMac Financial Services Inc	PFSI.K	\$17.08	77	\$1.3	\$3.2	6.5x	5.9x	5.8x	\$ 15.63	109%	0.0%								
<i>Mortgage Oriented Banks</i>																			
Flagstar Bancorp Inc	FBC	\$31.34	57	\$1.8	\$5.5	13.3x	11.4x	10.5x	\$ 24.28	129%	0.0%								
Hilltop Holdings Inc	HTH	\$24.65	96	\$2.4	\$7.0	15.5x	12.9x	12.1x	\$ 16.59	149%	1.0%								
HomeStreet Inc	HMST.O	\$24.73	27	\$0.7	\$5.3	15.9x	12.0x	9.5x	\$ 23.30	106%	0.0%								
Towne Bank	TOWN.O	\$30.85	62	\$1.9	\$4.6	19.7x	15.8x	15.2x	\$ 12.81	241%	1.8%								
<i>Major Banks</i>																			
First Republic Bank	FRC	\$97.03	157	\$15.3	\$81.9	21.8x	18.3x	16.2x	\$ 37.83	256%	0.7%								
U.S. Bancorp	USB	\$51.77	1,673	\$86.6	\$312.0	15.1x	13.6x	12.6x	\$ 19.60	264%	2.2%								
<i>Fin Tech</i>																			
Ellie Mae Inc	ELLI.K	\$82.64	34	\$2.8	\$32.1	55.6x	45.4x	36.6x	\$ 18.22	454%	0.0%								
Black Knight Financial Services Inc	BKFS.K	\$41.95	153	\$6.4	\$11.5	30.6x	26.2x	23.4x	\$ (14.00)	nmf	0.0%								
<i>Building Materials</i>																			
Builders FirstSource Inc	BLDR.O	\$14.98	113	\$1.7	\$14.4	13.4x	10.3x	8.0x	nmf	nmf	0.0%								

Source: Wedbush Securities Inc. Estimates, Consensus Estimates, Company Reports, and SNL

Risks to the Attainment of Our Price Targets and Ratings: Specialty Finance

Cyclical trends in credit quality, interest rate sensitivity and regulatory factors present risks to all of our stocks.

Risks to the Attainment of Our Price Targets and Ratings: Real Estate Finance and Services

Cyclical trends in credit quality, interest rate sensitivity and regulatory factors present risks to all of our stocks

Analyst Certification

We, Henry Coffey, Peter J. Winter, Jason Weaver, Jay McCanless and David J. Chiaverini, certify that the views expressed in this report accurately reflect our personal opinions and that we have not and will not, directly or indirectly, receive compensation or other payments in connection with our specific recommendations or views contained in this report.

Mentioned Companies

Company	Rating	Price	Target
Black Knight Financial Services	OUTPERFORM	\$42.35	\$44.00
Builders FirstSource	OUTPERFORM	\$14.84	\$20.00
Ellie Mae	NEUTRAL	\$82.49	\$90.00
Flagstar Bancorp	OUTPERFORM	\$31.51	\$35.00
First Republic Bank	OUTPERFORM	\$96.95	\$119.00
Nationstar Mortgage Holdings	OUTPERFORM	\$16.77	\$19.00
PHH Corp.	NEUTRAL	\$14.22	\$14.50
PennyMac Mortgage Investment Trust	NEUTRAL	\$17.36	\$16.75
U.S. Bancorp	NEUTRAL	\$51.81	\$55.00

Investment Rating System:

OUTPERFORM: Expect the total return of the stock to outperform relative to the median total return of the analyst's (or the analyst's team) coverage universe over the next 6-12 months.

NEUTRAL: Expect the total return of the stock to perform in-line with the median total return of the analyst's (or the analyst's team) coverage universe over the next 6-12 months.

UNDERPERFORM: Expect the total return of the stock to underperform relative to the median total return of the analyst's (or the analyst's team) coverage universe of the next 6-12 months.

The Investment Ratings are based on the expected performance of a stock (based on anticipated total return to price target) relative to the other stocks in the analyst's coverage universe (or the analyst's team coverage).*

Rating distribution (as of August 24, 2017)	Investment Banking Relationships (as of August 24, 2017)
OUTPERFORM: 56.20%	OUTPERFORM: 11.04%
NEUTRAL: 41.24%	NEUTRAL: 1.77%
UNDERPERFORM: 2.55%	UNDERPERFORM: 0.00%

The Distribution of Ratings is required by FINRA rules; however, WS' stock ratings of Outperform, Neutral, and Underperform most closely conform to Buy, Hold, and Sell, respectively. Please note, however, the definitions are not the same as WS' stock ratings are on a relative basis.

The analysts responsible for preparing research reports do not receive compensation based on specific investment banking activity. The analysts receive compensation that is based upon various factors including WS' total revenues, a portion of which are generated by WS' investment banking activities.

Company Specific Disclosures

1. WS makes a market in the securities of Black Knight Financial Services, Builders FirstSource, Ellie Mae, Flagstar Bancorp, First Republic Bank, Nationstar Mortgage Holdings, PHH Corp., PennyMac Mortgage Investment Trust and U.S. Bancorp.

Price Charts



Wedbush disclosure price charts are updated within the first fifteen days of each new calendar quarter per FINRA regulations. Price charts for companies initiated upon in the current quarter, and rating and target price changes occurring in the current quarter, will not be displayed until the following quarter. Additional information on recommended securities is available on request.

Disclosure information regarding historical ratings and price targets is available at <http://www.wedbush.com/ResearchDisclosure/DisclosureQ217.pdf>

*WS changed its rating system from (Strong Buy/ Buy/ Hold/ Sell) to (Outperform/ Neutral/ Underperform) on July 14, 2009.

Please access the attached hyperlink for WS' Coverage Universe: <http://www.wedbush.com/services/cmg/equities-division/research/equity-research>

Applicable disclosure information is also available upon request by contacting James Kim in the Research Department at (213) 688-4380, by email to james.kim@edbush.com, or the Business Conduct Department (213) 688-8090. You may also submit a written request to the following: Business Conduct Department, 1000 Wilshire Blvd., Los Angeles, CA 90017.

OTHER DISCLOSURES

The information herein is based on sources that we consider reliable, but its accuracy is not guaranteed. The information contained herein is not a representation by this corporation, nor is any recommendation made herein based on any privileged information. This information is not intended to be nor should it be relied upon as a complete record or analysis: neither is it an offer nor a solicitation of an offer to sell or buy any security mentioned herein. This firm, Wedbush Securities, its officers, employees, and members of their families, or any one or more of them, and its discretionary and advisory accounts, may have a position in any security discussed herein or in related securities and may make, from time to time, purchases or sales thereof in the open market or otherwise. The information and expressions of opinion contained herein are subject to change without further notice. The herein mentioned securities may be sold to or bought from customers on a principal basis by this firm. Additional information with respect to the information contained herein may be obtained upon request.

Equity Research

HEALTHCARE			RETAIL AND CONSUMER		
Biotechnology			Food & Beverage		
David Nierengarten, Ph.D.	david.nierengarten@wedbush.com	(415) 274-6862	Colin Radke	colin.radke@wedbush.com	(213) 688-6624
Biotechnology			Footwear & Apparel		
Robert Driscoll	robert.driscoll@wedbush.com	(415) 274-6863	Christopher Svezia	christopher.svezia@wedbush.com	(212) 938-9922
Emerging Pharmaceuticals			Hardlines Retail		
Liana Moussatos, Ph.D.	liana.moussatos@wedbush.com	(415) 263-6626	Seth Basham	seth.basham@wedbush.com	(212) 938-9954
Medical Devices			Homebuilders/Building Products		
Tao Levy	tao.levy@wedbush.com	(212) 938-9948	Jay McCanless	jay.mccanless@wedbush.com	(212) 833-1381
TMT			Leisure		
Payments/IT Services			James Hardiman	james.hardiman@wedbush.com	(212) 833-1362
Moshe Katri	moshe.katri@wedbush.com	(212) 938-9947	Restaurants		
Digital Media			Nick Setyan	nick.setyan@wedbush.com	(213) 688-4519
Michael Pachter	michael.pachter@wedbush.com	(213) 688-4474	FINANCIAL INSTITUTIONS GROUP		
Digital Media			Financial Infrastructure & Real Estate Finance		
Nick McKay	nick.mckay@wedbush.com	(213) 688-4343	Jason Weaver	jason.weaver@wedbush.com	(212) 833-1383
Internet: E-commerce			Mid-Cap Banks		
Aaron Turner	aaron.turner@wedbush.com	(213) 688-4429	David Chiaverini	david.chiaverini@wedbush.com	(212) 938-9934
Enterprise Software			Regional Banks		
Steve Koenig	steve.koenig@wedbush.com	(415) 274-6801	Peter Winter	peter.winter@wedbush.com	(212) 938-9942

RESEARCH MANAGEMENT

Jesse Bigelow
 Director of Research
jesse.bigelow@wedbush.com
 (212) 259-6581

EQUITY CO-HEADS

Kirsten Fraunes
kirsten.fraunes@wedbush.com
 (213) 688-4404

Ian Winer
ian.winer@wedbush.com
 (213) 688-4471

CORPORATE ACCESS

Anita Minassian
 VP, Corporate Access
wedbush.conferences@wedbush.com
 (213) 688-4404

Phylicia Kirven
 AVP, Corporate Access
equitymarketing@wedbush.com
 (213) 688-4455

TRADING

Consumer		Financials
Jack Collins	jack.collins@wedbush.com	(415) 274-6816
Healthcare		
Sahak Manuelian	sahak.manuelian@wedbush.com	(213) 688-4533

WEDBUSH OFFICES		
LOS ANGELES	NEW YORK	SAN FRANCISCO
1000 Wilshire Boulevard Los Angeles, CA 90017 (213) 688-8000	142 W 57th Street New York, NY 10019 (212) 938-9920	2 Embarcadero Center, Suite 600 San Francisco, CA 94111 (415) 273-7300
BOSTON		CHICAGO
265 Franklin Street Boston, MA 02110 (617) 832-3700		141 W. Jackson Boulevard, Suite 1710A Chicago, IL 60604 (312) 786-1930