National Mortgage Risk Index (NMRI) and Other Risk Measures

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NMRI Key Takeaways

• Mortgage risk jumped in July with all indices setting new series’ highs for July.
  – The composite Purchase NMRI was up 0.5 ppt from July 2017.
    • FHA index set new series’ highs at 28.0%.
  – Refi NMRI also set a new series’ high primarily due to a higher Cash-Out Refi NMRI.

• Agency purchase volume was up from a year ago.
  – Purchase volume by count was up 1.3% from July 2017, and up 21% from July 2013.
  – Total purchase and refinance volume by count was down 10% from July 2017.

• Maintaining purchase volume continues to be too reliant on further agency credit easing, seen as needed to offset headwinds from gradually rising interest rates resulting from slightly less accommodative monetary policy and rapid home price increases.

• Higher NMRI indicates agencies continue to increase leverage to maintain levels of mortgage activity and in furtherance of their “affordable housing” mission.
  – FHA continues to loosen at a breath-taking pace.
  – Fannie’s purchase risk index in July 2018 was 1 ppt higher than Freddie’s.
  – The national seller’s market continued for its 73rd consecutive months. Further credit easing will be capitalized into higher prices, especially at the lower end of the market.

• Drivers of greater risk were:
  – An immense shift towards higher DTIs after GSEs increased DTI limit to 50 without compensating factors.
  – A massive increase in cash-out risk, which has more than doubled from July 2013.

• July NMRI covers 34.2 million agency loans back to Sept. 2012, consisting of 17.1 million purchase loans and 17.1 million refinance loans.
  – Data cover about 99% of gov't-guaranteed mortgages for purchase and refi loans.
NMRI: A Quick Primer

• Overall goal:
  – Monitor market stability through accurate, real-time tracking of leverage that, if left unchecked, would result in destructive housing booms/busts.

• Principles behind the NMRI
  – NMRI is a stress test, similar to a car crash safety rating or hurricane rating for buildings.
  – The NMRI’s stress event is the financial crisis from 2007.

• Basics of index construction
  – The NMRI is a standardized quantitative index for mortgage risk (leverage)
  – Places loans in risk buckets and assesses default risk based on performance of 2007 vintage loans with similar characteristics

• Advantages of the NMRI
  – Near-complete census of gov’t-guaranteed loans,
  – Accurate, timely, and in-depth coverage of purchase mortgage trends
  – NMRI provides significant signals of market trends without the noise of other indices

• What does an increasing or decreasing NMRI mean?
  – Increasing NMRI = increasing leverage = looser lending
  – Decreasing NMRI = decreasing leverage = tighter lending
## Stressed Default Rates, Home Purchase Loans

<table>
<thead>
<tr>
<th>Risk Bucket</th>
<th>Credit Score</th>
<th>CLTV</th>
<th>Total DTI</th>
<th>Default Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>≥ 770</td>
<td>61-70%</td>
<td>≤ 33%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Low</td>
<td>720-769</td>
<td>76-80%</td>
<td>34-38%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Medium</td>
<td>690-719</td>
<td>81-85%</td>
<td>39-43%</td>
<td>9.3%</td>
</tr>
<tr>
<td>High</td>
<td>660-689</td>
<td>91-95%</td>
<td>44-50%</td>
<td>22.7%</td>
</tr>
<tr>
<td>Very High</td>
<td>620-639</td>
<td>&gt; 95%</td>
<td>&gt; 50%</td>
<td>45.8%</td>
</tr>
</tbody>
</table>

Note: Default rates represent cumulative defaults through year-end 2012 for Freddie Mac’s 2007 vintage of acquired loans. The loans included in the calculation are all primary owner-occupied, 30-year fixed-rate, fully amortizing, fully documented, home purchase loans.

- Takeaway: Huge spread of default rates across risk buckets
- All 320 risk buckets for home purchase loans are shown at [Periodic Table – Purchase](#)
- Analogous tables for cash-out and no-cash-out refi loans are at [Periodic Tables – Refinance](#)
- Additional loan risk factors applied to VA loans and to ARMs, investor loans, second homes, 15 year terms, and 20 year terms
Composite NMRI for purchase loans jumped 0.5 ppt from elevated levels a year ago. The first-time buyer index jumped 0.6 ppt, primarily due to FHA being up 2.0 ppts. The Repeat buyer index was up slightly. Rising prices are having a disparate impact on buyers, benefitting repeat buyers through asset appreciation, and hurting FTBs who have to take on more leverage.

Note: Includes all types of NMRI purchase loans (primary owner-occupied, second home, and investor loans).

**NMRI for Home Purchase Loans**

*Composite index has consistently been trending up since mid-2013, with FHA leading the way. The FHA index set a new series' high in July. Unless household income accelerates, future support for the housing market will likely involve further increases in leverage from an already high level.*

*Stressed default rate*

- **FHA**: +6.5 ppts, from 21.4 to 28.0%*
- **Composite**: +2.1 ppts, from 11.1% to 13.2%*
- **VA**: +1.5 ppts, from 10.8% to 12.2%*
- **Fannie**: +2.6 ppts, from 5.3% to 7.9%*
- **RHS**: -0.7 ppt, from 19.6 to 19.0%*
- **Freddie**: +1.7 ppts, from 4.9% to 6.6%*

FHA share of purchase loans:
- May-18: 22.4%; June-18: 22.1%; July: 22.2%

* Change from July 2013 to July 2018.

Source: AEI, Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing). RHS is Rural Housing Service.
All agency volume was down 10% from a year ago. Refi volume has slowed since the end of 2016. As interest rates have moved sharply higher since November 2016, refi volume, and especially no-cash out refi volume, has contracted. We project total agency volume for 2018 to come in around 5.2m (down 5% from 2017 volume of 5.4m), which is based on flat purchase volume, slightly decreasing no-cash-out, and slightly increasing cash out activity. For 2019, we estimate 5.2m originations based on similar assumptions. Quarter-to-quarter, the 2019 count variation will be driven by seasonal purchase volume changes.

Leverage Fueled Housing Demand Continues to Grow

Purchase volume was up 1 percent from a year earlier and up 21 percent from 5 years ago; first-time buyer volume was up 2 percent and up 33 percent for the same periods. Maintaining demand continues to be reliant on further agency credit easing, which is needed to offset headwinds from a slightly less accommodative monetary policy and accelerating home price increases.

Note: July 2018 count is a preliminary estimate. First-time buyer volume not available before February 2013.
While growth in purchase lending volume has paused, it has not paused equally across the risk spectrum. In July, subprime volume grew robustly, while prime and near prime contracted. Historically, most of the growth in volume has come from the near-prime and especially the subprime segment.

Note: Prime loans are defined as having a stressed default rate less than 6%; near-prime loans are between 6 to 12%; subprime loans are greater than 12%.
Major market shifts are often related to pricing changes. The largest effect was from FHA’s mortgage insurance premium (MIP) cut in January 2015, which boosted FHA’s market share from 23% to 30%. Recently, FHA’s share has declined, returning FHA back to its pre-MIP cut level. As Freddie’s MBS execution price has improved, it has recently picked up share.
Since 2014, Freddie’s share of GSE lending has fluctuated between 37 and 46 percent with the series exhibiting greater swings lately. Freddie’s implementation of the Common Securitization Platform for its loans has helped its MBS improve liquidity and obtain pricing parity with Fannie’s MBS. Interestingly, Fannie’s MRI is rapidly pulling away from Freddie’s and is now 1 ppt higher. It remains to be seen whether the FHFA “suggests” Freddie ease underwriting to match what Fannie is doing.

Source: AEI, Center on Housing Markets and Finance, [www.AEI.org/housing/](http://www.AEI.org/housing/).
Supply-Demand Imbalance in the Market Is Driving Prices Up

The NAR’s not-seasonally adjusted months inventory in September stood at 4.5 months, up 0.5 months from a year ago. However, that metric was unchanged for the 3 months prior, making it too soon to project a return of a buyer’s market. Instead, we expect the seller’s market to continue. This means further credit easing will be capitalized into higher home prices. According to the FHFA, not-seasonally adjusted home prices rose 6.1% in August year-over-year, down from 6.9% a year ago. The chart below shows a 6 months trailing average of monthly house price changes to smooth out seasonal spikes in prices and show the strong inverse relationship between supply and prices.

* National Association of Realtors (NAR) “Number of homes available for sale (NSA)” divided by NAR’s “Existing Homes Sales (NSA).” The NAR defines a seller’s market to exist when the inventory of existing homes for sale would be exhausted in six months or less at the current sales pace. Conversely, a buyer’s market exists when the inventory of existing homes for sale exceeds six months at the current sales pace. (http://www.realtor.org/news-releases/2013/04/march-existing-home-sales-slip-due-to-limited-inventory-prices-maintain-uptrend).

** FHFA Monthly Purchase-Only Not Seasonally Adjusted house price index. The series is a 6 month trailing average.

Which Risk Factors Have Driven Up the Purchase NMRI?

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<tbody>
<tr>
<td>Credit score &lt; 660</td>
<td>11%</td>
<td>15%</td>
<td>16%</td>
<td>16%</td>
<td>16%</td>
<td>17%</td>
</tr>
<tr>
<td>DTI &gt; 43%</td>
<td>23%</td>
<td>23%</td>
<td>26%</td>
<td>26%</td>
<td>29%</td>
<td>36%</td>
</tr>
<tr>
<td>CLTV ≥ 95%</td>
<td>53%</td>
<td>55%</td>
<td>59%</td>
<td>58%</td>
<td>57%</td>
<td>57%</td>
</tr>
<tr>
<td>30-year term</td>
<td>93%</td>
<td>94%</td>
<td>94%</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>Risk Layering*</td>
<td>22%</td>
<td>24%</td>
<td>27%</td>
<td>27%</td>
<td>28%</td>
<td>32%</td>
</tr>
</tbody>
</table>

*Risk layering is defined as having at least 3 of the 4 features presented in the table above present in a loan.
Note: Calculated for primary home purchase loans with a government guarantee and reported risk factor.

• Since 2013, all the key risk factors have contributed, which has magnified the effect on the NMRI through risk layering. An increasing share of loans have:
  – Subprime credit scores
  – High DTIs
  – High CLTVs
  – 30-year terms
• Over the past two years, especially DTIs have especially moved higher.
As we have been predicting, the share of loans with DTI > 43% is now growing rapidly to compensate for faster home price increases compared to incomes, a trend most pronounced for Fannie (+13.1 ppts over past 12 months) and FHA (+5.6 ppts). Despite Fannie’s announcement in March to update its Desktop Underwriting, after it had first raised the DTI limit to 50 in August 2017, there is little evidence that it has actually reigned in this segment. The only exceptions to the trend are RHS and Portfolio lenders.

Note: Data pertain to purchase loans for primary owner-occupied properties. Data for the portfolio line come from LLMA and McDash after removing duplicative loans. The data are weighted by loan amount buckets and origination year using HMDA weights (lag due to time needed to allow for sales to GSEs). Weights for 2018 are assumed to be identical to 2017.

* A seller’s market, defined by the National Association of Realtors (NAR) as a home inventory supply of 6 months or less, has been present since Sept. 2012.

Source: AEI, Center on Housing Markets and Finance, www.AEI.org/housing, CoreLogic, and Black Knight.
**DTI Distributions, Agency Primary Purchase Loans**

*Data pertain to all agency purchase loans for primary owner-occupied properties.*

**DTIs have been shifting higher as the rise in house prices has been outpacing income gains. The share of DTIs below 34% has declined sharply, offset by a much greater share of DTIs above 40%. While bullish for home prices in the near term, this presents long-term sustainability problems for both homeowners and the FHA.

**California shows how the shift could intensify as affordability worsens.**
The Combined Purchase and Refi NMRI set a series’ high in July. There has been a sharp trend reversal on refis, which tend to follow feast-and-famine cycles depending on the mortgage rate. The Refi series is pulling away steeply from the Purchase one after having converged at elevated levels.

Similar to purchase loans, a huge gap has opened up in the riskiness of refinance loans originated by banks and nonbanks. Nonbanks have increased risk by lowering standards for every major risk factor, making them the preferred risk channel. Banks have reduced risk by shifting away from subprime borrowers and low down payment loans. Given this large difference in risk score, there is little indication that banks will win back the market share they lost to nonbanks any time soon.

Note: Composite includes credit unions and state housing agencies, which are not shown separately.
Source: AEI, Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing).
The Refi NMRI set a series’ high in July, powered by the rapidly increasing Cash-Out index. The Cash-Out NMRI has more than doubled since the start of the series, and now exceeds both No-Cash-Out by 3.5 ppts and Purchase NMRI by 2.5 ppts. Cash-Out NMRI is largely driven by growth in volume and risk on FHA and VA guaranteed loans.

Market share for cash-out refis has shifted from the GSEs to the FHA and VA. FHA and VA accounted for less than 10% of market share in 2012. In 2018, they account for 31%, with FHA’s share surging recently. This increase has powered the increase in the riskiness in the cash-out index.

VA and FHA were both losing market share as early as 2018. However, the trend between the two agencies diverges around May 2018, right around the time the VA was subjected to a new statute designed to reign in predatory no cash-out refi lending. The VA share is now near its series' low dating back to October 2013.

Source: AEI, Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing).
Briefing Dates for 2018 and 2019

- Monthly rotation of three briefing topics: mortgage risk (NMRI), first-time buyers, and housing market trends (NHMI). One topic per month.
- Next briefing on Tuesday, November 27.
- The briefings for 2018 - 2019 are listed below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Tuesday</td>
<td>November 27</td>
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<tr>
<td>Monday</td>
<td>January 7, 2019</td>
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<td>Monday</td>
<td>January 28</td>
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<td>Monday</td>
<td>February 25</td>
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<td>Monday</td>
<td>April 1</td>
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<td>Monday</td>
<td>April 29</td>
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<tr>
<td>Tuesday</td>
<td>May 29</td>
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<tr>
<td>Monday</td>
<td>July 1</td>
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<td>Monday</td>
<td>July 29</td>
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<tr>
<td>August</td>
<td><em>no briefing</em></td>
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<td>Monday</td>
<td>September 30</td>
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<td>Monday</td>
<td>October 28</td>
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<td>Monday</td>
<td>November 25</td>
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<td>Monday</td>
<td>January 6, 2020</td>
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</tbody>
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- All briefings take place at 11 AM ET.
## List of Acronyms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>MRI</td>
<td>The <strong>Mortgage Risk Index</strong> (MRI) measures how the loans originated in a given month would perform if subjected to the same stress as loans originated in 2007, which experienced the highest default rates as a result of the Great Recession.</td>
</tr>
<tr>
<td>NMRI</td>
<td>The <strong>National Mortgage Risk Index</strong> (NMRI) currently covers home purchase and refinance loans (except for VA refinances) that have been (1) acquired and securitized by Fannie Mae or Freddie Mac or (2) insured or guaranteed by the Federal Housing Administration (FHA), the Department of Veterans Affairs (VA), or the Rural Housing Service (RHS).</td>
</tr>
<tr>
<td>SMRI</td>
<td>The <strong>State-level Mortgage Risk Index</strong> (SMRI) measures mortgage risk on a state level. It employs exactly the same stress-test methodology as the national index.</td>
</tr>
<tr>
<td>FBMSI</td>
<td>The <strong>First-time Buyer Mortgage Share Index</strong> (FBMSI) equals the number of loans made to first-time buyers divided by the number of all home purchase loans excluding those made to investors and second home buyers for any given month (see first-time buyer (FTB) definition below). The agency FBMSI covers government-guaranteed loans, while the combined FBMSI covers both government-guaranteed and private-sector loans. The agency loans are from the same database used for the NMRI, while the private-sector component of the combined FBMSI come from AEI’s National Housing Market Index (NHMI) and assumptions believed to be reasonable.</td>
</tr>
<tr>
<td>FBMRI</td>
<td>The <strong>First-time Buyer Mortgage Risk Index</strong> (FBMRI) is calculated using the same methodology as for the NMRI. The only difference is that the set of included loans is restricted to first-time buyers.</td>
</tr>
<tr>
<td>FTB</td>
<td>AEI uses the federal government’s definition of a <strong>first-time homebuyer</strong> (FTB). A FTB is an individual borrower who (1) is purchasing the mortgaged property, (2) will reside in the mortgaged property as a primary residence, and (3) had no ownership interest (sole or joint) in a residential property during the three-year period preceding the date of the purchase of the mortgaged property. Investment properties, second homes, and refinance transactions are not eligible to be considered first-time homebuyer transactions. Other organizations such as the National Association of Realtors (NAR) use a different definition of FTB based on self-identification.</td>
</tr>
<tr>
<td>RB</td>
<td>Repeat Buyers (RB) are all home buyers that are not first-time buyers.</td>
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<tr>
<td>Term</td>
<td>Description</td>
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<tr>
<td>GSE</td>
<td>A Government-Sponsored Enterprise (GSE) is an entity created by Congress that operates under a government-defined mission and charter. There are two housing-related GSEs: Freddie Mac and Fannie Mae. They purchase mortgages on the secondary market and subsequently pool them into mortgage-backed securities (MBS), which are purchased by government and private investors.</td>
</tr>
<tr>
<td>Fannie Mae</td>
<td>The Federal National Mortgage Association (FNMA), known as Fannie Mae, was founded in 1938 as part of the New Deal legislation.</td>
</tr>
<tr>
<td>Freddie Mac</td>
<td>The Federal Home Loan Mortgage Corporation (FHLMC), known as Freddie Mac, was created in 1970 to complement Fannie Mae.</td>
</tr>
<tr>
<td>Ginnie Mae</td>
<td>The Government National Mortgage Association (Ginnie Mae) is a federal government corporation that aims to promote homeownership for low- and moderate-income families. It ensures the timely payment of principal and interest on mortgage-backed securities formed from mortgages that are guaranteed or insured by FHA, VA, RHS, or smaller programs for Native Americans. Ginnie Mae was created in 1968. Prior to 1968 its role was performed by Fannie Mae.</td>
</tr>
<tr>
<td>FHA</td>
<td>The Federal Housing Administration (FHA), founded in 1934, is a federal agency that today provides mortgage insurance for residential loans made to high-risk borrowers. The borrower pays an upfront mortgage insurance premium as well as monthly insurance premiums for the service. In return, FHA covers 100% of the lender’s loss in case of the borrower’s default.</td>
</tr>
<tr>
<td>RHS</td>
<td>The Rural Housing Service (RHS) is a program within the U.S. Department of Agriculture that guarantees mortgages in rural areas. The borrower pays an upfront annual fee for the service. In return, RHS covers 100% of lender’s loss in case of the borrower’s default.</td>
</tr>
<tr>
<td>VA</td>
<td>The Department of Veterans Affairs (VA) guarantees mortgages to eligible veterans and generally pays 25% of lender’s loss in case of the borrower’s default. The borrower pays an upfront annual fee for the service.</td>
</tr>
<tr>
<td>HUD</td>
<td>FHA has been overseen by the Department of Housing and Urban Development (HUD) since its creation in 1965.</td>
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# List of Acronyms (cont’d)

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>FICO®</td>
<td>The <strong>FICO Credit Score</strong> is a statistical credit evaluation score developed by Fair, Isaac and Co. The FICO score attempts to measure a borrower’s risk of default through his or her personal financial history. FICO scores range from a high default-risk score of 300 to a low default-risk score of 850. The term “credit score” is used to connote a generic score.</td>
</tr>
<tr>
<td>LTV / CLTV</td>
<td>The <strong>Loan-to-Value Ratio</strong> (LTV) is the ratio of the 1st lien loan amount to the property’s value. Since the down payment on a purchase transaction is the property’s value minus the loan amount, the LTV is inversely related to the down payment. The <strong>Combined Loan-to-Value</strong> (CLTV) is the ratio of all loan amounts at 1st lien origination to the property’s value. Both ratios are a measure of a borrower’s skin in the game.</td>
</tr>
<tr>
<td>DTI</td>
<td>The total <strong>Debt-to-Income Ratio</strong> (DTI) gauges the ability of a borrower to repay a mortgage by measuring the amount of income consumed for repayment of all outstanding debts of the borrower.</td>
</tr>
<tr>
<td>ARM</td>
<td>An <strong>Adjustable-Rate Mortgage</strong> (ARM) is a mortgage whose interest rate varies over the lifetime of the loan based on market conditions. ARMs have on average a higher default risk than FRMs.</td>
</tr>
<tr>
<td>FRM</td>
<td>A <strong>Fixed Rate Mortgage</strong> (FRM) maintains the interest rate at origination throughout the lifetime of the loan.</td>
</tr>
<tr>
<td>MSA</td>
<td>A <strong>Metropolitan Statistical Area</strong> (MSA) is a geographical region with a population of at least 50,000 inhabitants at its core and close economic ties throughout the region.</td>
</tr>
<tr>
<td>PCE price index</td>
<td>The <strong>Personal Consumption Expenditure</strong> (PCE) price index measures the prices of goods and services purchased by consumers in the U.S. economy. It is published monthly by the Bureau of Economic Analysis in the Department of Commerce. The PCE price index is the measure of inflation targeted by the Federal Reserve.</td>
</tr>
<tr>
<td>SLOOS</td>
<td>The <strong>Senior Loan Officer Opinion Survey on Bank Lending Practices</strong> (SLOOS) is a survey of lending conditions conducted quarterly by the Federal Reserve among roughly eighty large domestic banks and twenty-five U.S. branches and agencies of foreign banks.</td>
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</table>
## List of Acronyms (cont’d)

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<tbody>
<tr>
<td>QM/QRM</td>
<td>The <strong>Qualified Mortgage</strong> (QM) and the <strong>Qualified Residential Mortgage</strong> (QRM) are mortgage terms created under the Dodd-Frank Act. A mortgage that meets the QM requirements provides legal protection for lenders against a claim that the loan was made without due consideration of the borrower’s ability to repay. The QRM designation relates to the securitization of mortgages. If the loans in a mortgage-backed security are QRMs, the securitizing agent is not required to retain any risk position in the security. Although the initial proposed QRM definition was relatively strict, the final definition was watered down to be equivalent to the looser QM definition. The five guarantee agencies (Fannie Mae, Freddie Mac, FHA, VA, and RHS are exempt from substantial portions of the QM rules and entirely from the QRM rules. (For Fannie and Freddie, this exemption applies only while they are in conservatorship).</td>
</tr>
<tr>
<td>MIP</td>
<td>The <strong>Mortgage Insurance Premium</strong> (MIP) is a payment to compensate for the risk of default on the mortgage. As noted above, FHA mortgages carry both upfront and monthly MIP payments. Fannie Mae and Freddie Mac generally require mortgage insurance for loans they guarantee with LTVs above 80%; borrowers with these GSE-guaranteed loans may make monthly MIP payments depending on the premium plan.</td>
</tr>
<tr>
<td>TRID</td>
<td>The <strong>TILA-RESPA Integrated Disclosure (TRID)</strong> rule – commonly also known as Know Before You Owe – requires lenders to summarize and more prominently display the loan terms on the mortgage form. It also institutes a three-day waiting period before closing to allow borrowers time to review the contract. The form change is currently suppressing sales volume as it is delaying loan closings by creating additional burdens on lenders. TRID was mandated by the Consumer Financial Protection Bureau (CFPB) and applies to mortgage applications filed on or after October 3, 2015.</td>
</tr>
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Appendix

Additional slides and those not included every month:

- National Mortgage Risk Index: Loan Totals
- Background: Financial Crisis and AEI’s Response
- Principles of Housing Finance
- Pinto’s Principles of Housing Finance
- Definition of Low-Risk Loans
- GSEs: Large Lender Market Share and Relative Risk Share, Purchase Loans
- FHA: Large Lender Market Share and Relative Risk Share, Purchase Loans
- DTI Distributions, GSE & FHA Purchase Loans
- Origination Shares and MRIs by Seller Lender Type, GSE Purchase Loans
- Origination Shares and MRIs by Issuer Lender Type, FHA Purchase Loans
- Origination Shares and MRIs by Seller Lender Type, GSE Refinance Loans
- Origination Shares and MRIs by Issuer Lender Type, FHA Refinance Loans
- State NMRI and FHA Share, Purchase Loans
- State NMRI Change, Purchase Loans
- Pricing Changes, Home Purchase Loans
- Volume Growth in Counts and Dollars
- A closer look at RHS’ October 2016 MIP cut
- No-Cash Out Refi Demand and 30-yr Mortgage Rate
- Low-Risk Origination Shares, Purchase Loans
- Calibrating Mortgage Safety
- Credit Conditions: 1990 to 2013-14
- Role of Income Leverage During Housing Boom
- Fed Tightening and Efforts to Maintain Buying Power
- Appraisals Should Be the Guard Rail Against Speculative Booms
- Cross-subsidies Return to GSEs
- Change in Agency Purchase Loan Volume
- GSEs: Ratio of NMRI for Loans with Total CLTV > 95% to Loans with Lower Total CLTVs
Appendix (cont’d)

- FICO® Score Distribution
- Median Downpayments
- Median Credit Score on Primary Purchase Loans
- Aggregate Default Risk Surge for Home Purchase Loans Is Over Four Years Old
- The Effect of April 2016 PMI Price Change
- Credit Score Distribution & MRIs, Primary Purchase Loans
- A Closer Look at the FHA/GSE > 95 CLTV Purchase Loan Market
- Purchase Loans with Down Payment of 5% or Less
- GSEs: Large Lender Market Share and Relative Risk Share, Refinance Loans
- FHA: Large Lender Market Share and Relative Risk Share, Refinance Loans
- Origination Shares and MRIs by Seller Lender Type, FHA Purchase Loans
- Update - Effect of FHA Mortgage Insurance Premium Cut
- Composite Origination Shares and MRIs by Channel, Purchase Loans
- Large Bank Origination Shares and MRIs by Channel, Purchase Loans
- Origination Shares and MRIs by Seller Lender Type, GSE Refinance Loans
- GSEs: Large Lender Market Share and Relative Risk Share, Refinance Loans
- FHA: Large Lender Market Share and Relative Risk Share, Refinance Loans
- Origination Shares and MRIs by Seller Lender Type, FHA Refinance Loans
- Agency Refi and Purchase Loan Counts
- Borrowing at the Conforming Loan Limit, Purchase Loans
- Fed’s Senior Loan Officer Survey is Badly Flawed
- Urban Myth: Tight Credit Keeping “Creditworthy” Borrowers Out of Market
- FHA Perpetuates This Myth
- FHA Is All about Moral Hazard
- FHA’s MIP Cut and House Prices for First-time Buyers
Appendix (cont’d)

– While FHA’s Capital Reached Required 2% Statutory Level for 1st Time since 2008, It Is Insufficient
– Share of States with Increase in SMRI for Purchase Loans from Year-Earlier Period*
– House Price Volatility, 51 Largest Metro Areas
– National Mortgage Market Index by Investor Type for Home Purchase Loans—Top 25 CBSAs
– Riverside/San Bernardino: A Case in Point
– Median Values of Risk Factors by Loan Type
– Risk Shares for Home Purchase Loans
– DTI Distributions, Agency Primary Purchase Loans
– Cash-Out Share and Home Equity
– Cash-Out Share and Home Equity II
– Nonbank Origination Shares and MRIs by Channel, Purchase Loans
– Greater House Price Volatility at the Lower End
– Housing Volatility Index
– The Underreported Story: Housing Demand Continues to Increase (Cont’d)
– Which Risk Factors Have Driven Up the NMRI
– Stressed Default Rates by Loan Type
– Agency Origination Shares and Pricing Changes, Purchase Loans
– Mortgage Risk Indices by Lender Type, Purchase Loans
– Origination Shares by Credit Score Bin, First-time Buyer Purchase Loans
– Which Risk Factors Have Driven Up the NMRI?
– The Effect of April 2016 PMI Price Change
Appendix (cont’d)

- Agency Purchase Loans with Credit Score < 700
- DTI Distributions, Agency Primary Purchase Loans*
- DTI Distributions and MRIs, Primary Purchase Loans
- Total DTI > 43% for More than 1 in 4 Purchase Loans
- DTI Distributions and MRIs, GSE Purchase Loans
- GSEs: Large Lender Market Share and Relative Risk Share, Purchase Loans
- FHA: Large Lender Market Share and Relative Risk Share, Purchase Loans
- Changes in the >95% CLTV Purchase Loan Market
- No-Cash-Out Refi and Cash-Out Refi NMRIs
- Refi NMRI: Effects of Refi Volume and FHA Share
- Combined, Purchase, and Refi NMRIs
- The Effect of FHA Mortgage Insurance Premium Cut
- FHA’s MIP Cut = Bad Policy. Little Additional Accessibility, Higher Priced Homes
- Home Purchase Mortgage Risk Index (MRI) in Major California Metro Areas
- Housing Risk in Major California Metro Areas
- Home Purchase Mortgage Risk Index (MRI) in Major Texas Metro Areas
- Housing Risk in Major Texas Metro Areas
- Distribution of House Price Change from Four Quarters Earlier in 81 US MSAs
- Nominal Percentage Increase in House Prices per annum for 28 Cities, April 1996 to 2014
- Jumbo portfolio-GSE spreads (in bps)
- Homeowners Can’t Count on House Price Gains to Build Wealth
- Evaluating the GSEs 2017 Business
- Evaluating the GSEs 2017 Business (cont.)
- Evaluating the GSEs 2017 Business (cont.)
Appendix (cont’d)

– Update: John Burns Intrinsic Home Values
– FHA’s NMRI for Home Purchase and Refinance Loans
– What explains FHA’s riskiness?
– How wide is the FHA credit box?
– FHA NMRI by Risk Decile, Home Purchase Loans
– FHA Median Downpayment and Sales Price
– What Does this Mean for the Broader Market?
– Borrowing at the Conforming Loan Limit, GSE Purchase Loans
– Mortgage Risk Indices by Lender Type, Purchase Loans
National Mortgage Risk Index: Loan Totals

- The July 2018 NMRI covers almost 34.2 million agency loans dating back to Sept. 2012. These data are used to construct the NMRI, First-Time Homebuyer Indices, and the National Housing Market Indexes (NHMI).

- This total consists of nearly 17.1 million agency purchase loans and over 17.1 million agency refinance loans.

- NMRI and other risk indices published for:
  - Purchase loans, with separate indices for first-time and repeat buyers
  - Refinance loans, with separate indices for no-cash-out and cash-out refis
  - Composite of purchase and refinance loans
  - Purchase loan NMRI is the primary measure for monitoring mortgage risk and the impact of housing policy, particularly with respect to first-time buyers
  - Refinance loan NMRI contributes to overall assessment of changes in leverage
Background: Financial Crisis and AEI’s Response

• Financial crisis largely stemmed from a failure to understand buildup of housing risk:
  – Mortgage risk
  – House-price (collateral) risk
  – Capital adequacy

• AEI’s Center on Housing Markets and Finance (AEI.org/housing) addresses this problem by undertaking evidence-based research that expands the body of knowledge concerning housing markets and finance:
  – Provides objective and transparent mortgage risk measures
    • Risk indices published monthly
  – Provides objective and transparent housing market indicators
    • Market indicators published quarterly
  – Provides objective and transparent house price appreciation measures
Principles of Housing Finance over 125 years (1850-1975)

• At all times, but especially in the last few years, people have dreamt of universalizing wealth by universalizing credit.... Now, in no country is it possible to transfer from one hand to another more products than there are (1850).  
• Since value depends on location, & location on convenience, & convenience on nearness, the intermediate steps may be eliminated & say that value depends on nearness. (1903)
• If a new utility does not arise, [sales] prices may advance & recede, while intrinsic values do not change. If a new utility arises, both [sales] prices & intrinsic values will alter their levels. (1903)
• Speculative elements cannot be considered as enhancing the security of residential loans [rather they] enhance the risk of loss to mortgagees [if] permit[ed] to creep into valuations....(1938)
• Because situations of scarcity [seller's market] or over-supply [buyer's market] do not last indefinitely they cannot be considered as phenomena the affect valuations for long-term use.... & not truly indicative of value for mortgage insurance purposes. (1947)
• The sequence of [market cycle] events is fairly predictable, though the period of the phases of the cycle & the amplitude of the variations are not subject to dependable forecasting. (1949)
• Inflationary construction costs, home purchase prices, & land prices not only loan disproportionate financial burdens upon the owners at time of acquisition but also form the bloated base upon which the major costs of occupancy [including property taxes] are determined for the entire term of ownership. (1949)
• The essential nature of housing demand is changeability; the nature of housing supply is rigidity. (1949)
• In a seller's market, when choice is restricted & the seller virtually dictates sales terms, more liberal credit is likely to be [capitalized] in price with probably a reduction in housing standards. (1951)
• Transitioning from buyer's to seller's market, maximum terms become so commonly used they tend to be considered the minimum. (1951)
• The parallel between the increases in the “costs” of new housing units & increases in the amount & percentage of needed funds that could be obtained by lengthening their terms & [reducing] downpayments raises the radical question of whether the disbursements made to assist purchasers & (renters) have not benefited others more than those whom they were intended to relieve. The largest groups to whom it is sometimes suggested some of the benefits may have flowed are the builders, building labor, the suppliers of building materials, & real estate brokers & speculators. (1975)

1. Corollary to Fisher’s capitalization rule: capitalization is added to land price

2. Uncertainty Principle: Can’t simultaneously set an asset’s credit risk & risk weight
   - A low risk designation and corresponding low capital weight (greater leverage) unleashes demand pressures causing it to no longer be low risk (think GSEs, private MBS, Greek sovereign debt)

3. Dual Underestimation Principle: Never underestimate the government’s willingness & ability to (i) add leverage to stimulate the market & (ii) ignore its impact on raising home prices and default risk under stress
   - Housing debt & default risk have increased with over 60 years of housing policies focused on increasing leverage

4. Law of the Marginal Buyer: Home prices will keep rising so long as the marginal buyer, who sets the price for all, has access to higher leverage (see #3)

5. Corollary: Historically the government has endeavored to add leverage in both buyer’s & seller’s markets; but the latter has potential for dangerous buildup of risk (see #1)
   - Result is an economics free zone promoting demand, while supply is restricted by regulation
     • FHA neither prices nor underwrites for risk
     • Government policies increase leverage regardless of rates going up or down
     • Low capital entities (FHA and GSEs) compete with each other over loosening credit
     • Affordable housing goals and duty to serve policies promote risky lending
Definition of Low-Risk Loans

• We define low-risk loans as those with a stressed default rate of less than 6%. Why?

• Low-risk definition calibrated from two sources
  – Original QRM proposal to implement Dodd-Frank
  – FHA underwriting standards over 1935-55
  – Both yield an average stressed default rate of ≈ 3%

• This is consistent with a maximum stressed default rate of ≈ 6% on individual loans, assuming a uniform distribution starting near 0%

• Hence the use of 6% as the highest stressed default rate for a low-risk loan
The current house price boom is about 6 years old and rate of house price increases is accelerating

- “Home Values Climbing at Fastest Rate in 12 Years....The median U.S. home value rose 8.7 percent to $215,600 in April, the fastest year-over-year climb since June 2006” Zillow, 5.24.17
- “Start of year sees strongest home price growth since 2005. ... About 60% of all U.S. metros saw an acceleration in the rate of price increases through February this year.” (Housing Wire, 5.7, 2018)
- “Housing confidence hits record high as home prices skyrocket. Consumer confidence in housing jumped to its highest level on record in April, according to Fannie Mae. Those who think home prices will move even higher rose the most, and those who think now is a good time to sell came in second.” (CNBC, 5.7.18)
- “Mortgage lenders are making it easier for you to buy a house. But are they repeating last decade's mistakes? Dana Wade, the acting Federal Housing Administration commissioner, minced few words in testimony last month before a U.S. House of Representatives committee. The FHA, the federal housing agency that insures mortgages made to first-time and lower-income buyers, has seen “certain trends and indicators of potential defaults.” Philadelphia Inquirer 5.4.18

A house price boom is when prices rise faster than fundamentals

The boom is driven by too much money chasing too few properties
- When the market is supply constricted (a seller's market), credit easing is likely to be capitalized in price.
- FHA, Fannie, Freddie, and the VA are all pro-cyclically fueling the boom

The length and acceleration of the boom adds urgency to shrink the GSEs and FHA by administrative action
Recent Steps by the GSEs, the FHA, and Regulators Add Fresh Fuel to the Long Running and Accelerating House Price Boom

- “Freddie Mac takes aim at FHA with widespread expansion of 3% down mortgages…. But now, Freddie Mac is about to supercharge its 3% down program and launch a widespread expansion of the offering.” (Housing Wire, 4.26.18)
- “Credit scores may jump starting this month…. Because of improved standards [from regulators] for utilizing new and existing public records, the three major credit reporting companies are now excluding all tax liens from credit reports. That means some scores will head higher, for some by as much as 30 points.” (CNBC, 4.12.18)
- “Manufactured housing giant endorses HUD's call for regulatory relief…. But the FHA has suffered major losses from insuring manufactured loans in the past and is unlikely to increase its role in this sector.” (National Mortgage News, 4.3.18)
- “Will The Gig Economy Change Mortgage Lending?…[r]ather than two years of iron-clad documentation, [GSEs] now say as little as 12 months of self-employment are enough, as long as the applicant’s previous employment is in the same field and his or her income remains steady.” (Mortgage Orb, 7.26.17)
- “If the lender obtains documentation to evidence the actual monthly payment is $0, the lender may qualify the borrower with the $0 payment as long as the $0 payment is associated with an income-driven repayment plan.” (Fannie Mae Selling Guide, 7.25.17)
- “Fannie Mae will ease financial standards for mortgage applicants next month… Fannie will be raising its DTI ceiling from the current 45 percent to 50 percent as of July 29.” (Washington Post, 6.6.17)
The CFPB’s Qualified Mortgage Policy and GSE Patch Allowed for Credit Easing While Supply Is Constrained, Becoming a Direct and Continuing Cause of the Current House Price Boom

• In 1.13, “Ability-to-Repay and Qualified Mortgage Standards” rule issued, effective 1.10.14
• The Bureau noted it will “protect consumers from irresponsible mortgage lending.”
  • The rule effectively set a maximum debt-to-income (DTI) limit of 43% for the private sector.
  • GSEs and their automated underwriting systems were exempted from this provision for seven years.
  • Similarly, FHA, the VA and the Department of Agriculture’s Rural Housing Services (RHS), were exempted for up to seven years or until these agencies issued their own rules codifying their own lending practices (which all subsequently did).
• The QM rule was pursuant to the Dodd-Frank Act’s calling for minimum mortgage standards
  • It was to make sure “prime” loans will be made responsibly
    • Yet it sets no minimum down payment, no minimum standard for credit worthiness, and no maximum debt-to-income ratio (for government agencies)
    • Under this definition of “prime”, a borrower can have no down payment, a credit score of 580, and a debt ratio over 50% as long as they are approved by a government-sanctioned underwriting system.
• That this would promote an unsustainable home price boom could be foreseen:
  • In 2013: “Booms are fueled by excessive leverage” and “this rule does little to limit borrower leverage and lays the foundation for the next bust.”*
  • In 1951: “[In transitioning] from a buyer's to a seller's market, maximum terms become so commonly used they tend to be considered the minimum.”**
• The Patch does not operate counter-cyclically so as to “take the punch bowl away” thereby slowing a leverage-fueled price boom.

---

**Fisher, Financing Home Ownership, NBER, 1951
### GSEs: Large Lender Market Share and Relative Risk Share, Purchase Loans

#### Large banks

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<td>5.4%</td>
<td>6.0%</td>
<td>6.2%</td>
<td>6.5%</td>
<td>6.8%</td>
<td>7.3%</td>
<td>7.4%</td>
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#### Not updated

- Wells Fargo
- US Bank
- SunTrust
- Flagstar
- JP Morgan
- Chase
- BB&T
- USAA
- Citi

#### Large nonbanks

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<td>7.4%</td>
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<td>United Shore</td>
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<td>6.2%</td>
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<tr>
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<td>7.3%</td>
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<tr>
<td>PennyMac</td>
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<td>6.0%</td>
<td>6.2%</td>
<td>6.5%</td>
<td>6.8%</td>
<td>7.3%</td>
<td>7.4%</td>
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<tr>
<td>Amerihome</td>
<td>5.4%</td>
<td>6.0%</td>
<td>6.2%</td>
<td>6.5%</td>
<td>6.8%</td>
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<td>7.4%</td>
</tr>
<tr>
<td>Fairway</td>
<td>5.4%</td>
<td>6.0%</td>
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<td>6.5%</td>
<td>6.8%</td>
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<td>7.4%</td>
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<td>Franklin American</td>
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<td>6.2%</td>
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<td>6.8%</td>
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<td>Guild</td>
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<td>7.4%</td>
</tr>
<tr>
<td>Freedom Mortgage</td>
<td>5.4%</td>
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<td>6.5%</td>
<td>6.8%</td>
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<td>Nationstar</td>
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<td>Lakeview</td>
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<td>6.5%</td>
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<td>7.3%</td>
<td>7.4%</td>
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<tr>
<td>Plaza</td>
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<td>6.8%</td>
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<td>Ditech</td>
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<td>6.8%</td>
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<td>Money Source</td>
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<td>6.0%</td>
<td>6.2%</td>
<td>6.5%</td>
<td>6.8%</td>
<td>7.3%</td>
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**Legend:**
- **30%**
- **20%**
- **10%**
- **5%**
- **1%**

- **25+%**
- **15 to 25%**
- **5 to 15%**
- **5 to -5%**
- **-5 to -15%**
- **-15 to -25%**
- **-25+%**

**Larger circle** represents larger market share. Lenders shown represent the 8 largest banks and 15 largest nonbanks by origination share in 2017.
FHA: Large Issuer Lender Type Market Share and Relative Risk Share, Purchase Loans

<table>
<thead>
<tr>
<th>Lender Type</th>
<th>Large banks</th>
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<th>Large nonbanks</th>
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<td><strong>NMRI</strong></td>
<td>22.0%</td>
<td>24.1%</td>
<td>22.0%</td>
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<tr>
<td>2013</td>
<td>24.6%</td>
<td>26.0%</td>
<td>24.6%</td>
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<tr>
<td>2014</td>
<td>27.4%</td>
<td>27.4%</td>
<td>26.0%</td>
</tr>
<tr>
<td>2015</td>
<td>28.0%</td>
<td>28.0%</td>
<td>27.4%</td>
</tr>
<tr>
<td>Wells Fargo</td>
<td>Green</td>
<td>Green</td>
<td>PennyMac</td>
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<tr>
<td>US Bank</td>
<td>Green</td>
<td>Green</td>
<td>Lakeview</td>
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<tr>
<td>Flagstar</td>
<td>Orange</td>
<td>Orange</td>
<td>Amerihome</td>
</tr>
<tr>
<td>SunTrust</td>
<td>Orange</td>
<td>Orange</td>
<td>Caliber</td>
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<tr>
<td>JPMorgan Chase</td>
<td>Orange</td>
<td>Orange</td>
<td>Freedom Mortgage</td>
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<tr>
<td>BB&amp;T</td>
<td>Orange</td>
<td>Orange</td>
<td>Quicken</td>
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<tr>
<td>Citi</td>
<td>Orange</td>
<td>Orange</td>
<td>Nationstar</td>
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<tr>
<td>Bank of America</td>
<td>Orange</td>
<td>Orange</td>
<td>Plaza</td>
</tr>
</tbody>
</table>

**Legend:**
- Larger circle represents larger market share.
- Lenders shown represent the 8 largest banks and 15 largest nonbanks by origination share in 2017.

Higher FHA risk share (relative to market share) vs. Lower FHA risk share (relative to market share).

- 25+% increase in FHA share
- 15 to 25% increase in FHA share
- 5 to 15% increase in FHA share
- 5 to -5% change in FHA share
- -5 to -15% change in FHA share
- -15 to -25% change in FHA share
- -25+% decrease in FHA share

40
Measure Market Behavior in Four Leverage Based Price Tiers

One of AEI’s innovations to track home price appreciation is to use four price bins, because the market behaves differently in each price bin.

- “Low” bin has all sales priced less than the bottom 40% of sales prices for FHA insured homes.
- The “Low-Medium” bin has all sales priced in the next 40% of sales prices for FHA insured homes.

Most first time buyers (FTB) in the bottom two bins, and their mortgage loans are much riskier. By contrast, the top two bins have relatively fewer FTBs, and buyers have much less risky loans.

<table>
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</thead>
<tbody>
<tr>
<td>Low</td>
<td>41%</td>
<td>26%</td>
<td>32%</td>
<td>14.5%</td>
<td>74%</td>
<td>$157,000</td>
<td>49%</td>
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<tr>
<td>Low-Med</td>
<td>35%</td>
<td>30%</td>
<td>29%</td>
<td>13.5%</td>
<td>63%</td>
<td>$229,900</td>
<td>43%</td>
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<tr>
<td>Med-High</td>
<td>28%</td>
<td>36%</td>
<td>12%</td>
<td>8.4%</td>
<td>39%</td>
<td>$365,000</td>
<td>23%</td>
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<tr>
<td>High</td>
<td>27%</td>
<td>8%</td>
<td>0.30%</td>
<td>3.2%</td>
<td>23%</td>
<td>$870,000</td>
<td>2%</td>
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<tr>
<td>Combined Low &amp;</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Low-Med</td>
<td>38%</td>
<td>56%</td>
<td>30%</td>
<td>14%</td>
<td>68%</td>
<td>$197,000</td>
<td>46%</td>
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<tr>
<td>Combined Med-High &amp; High</td>
<td>28%</td>
<td>44%</td>
<td>10%</td>
<td>7%</td>
<td>NA</td>
<td>$405,000</td>
<td>17%</td>
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Note: Dares are for largest 73 CBSAs and consist of 8.5 million sale transaction study covering 5-years of home price appreciation (HPA) for 41,000 census tracts. Weighting based on HMDA. Shares based on count. Low & med-low price tiers defined respectively as <=40th & >40th to <=80th percentile of FHA sales prices & med-high & high price tiers defined respectively as >80th percentile of FHA sales prices & <= 125% of GSE limit & > 125% of GSE limit, all at county-level. Mortgage Risk (Leverage) Loan Grades: High risk = >12%, Medium risk = >6% - 12%, Low risk = <=6%

House Price Trends Impacted by Leverage

On a constant-quality basis and market price basis, prices of low and low-medium priced homes have increased much faster than medium-high and high priced homes. With easy access to government-supplied leverage, buyers in low and low-medium tiers have had to make little compromise on quality.

Source: Dare are for largest 73 CBSAs and consist of 8.5 million sale transaction study covering 5-years of home price appreciation (HPA) for 41,000 census tracts. Weighting based on HMDA. Shares based on count. Low & med-low price tiers defined respectively as <=40th & >40th to <=80th percentile of FHA sales prices & med-high & high price tiers defined respectively as >80th percentile of FHA sales prices & <= 125% of GSE limit & > 125% of GSE limit, all at county-level. HPIs are smoothed around the times of FHFA loan limit changes. Source: AEI, Center on Housing Markets and Finance, www.AEI.org/housing.
FHA, GSE, & Private HPI for the low priced tier all went up about the same amount over 5 years—45%. Buyers with high mortgage risk set the price in this and low-medium market segment. VA & RHS had lower price gains, likely due to differing appraisal practices & DTI limitations.

Cumulative Constant-quality House Price Index, by Guarantor Type:
Low Price Tier (2012:Q4 = 0%)
High risk home purchase lending is fueling home price appreciation

In the largest 73 metros, currently 41% of agency purchase lending is high risk. FHA accounts for 57% of this high risk lending, which is down from 74% in 2012. Significantly, the GSEs account for nearly all of this high risk share shift. Their high risk share has increased from 10% in 2012 to 30% in 2018.

### High Risk loans by loan type (High risk = >12% Mortgage Risk Index)

<table>
<thead>
<tr>
<th></th>
<th>FHA</th>
<th>GSE</th>
<th>Portfolio</th>
<th>RHS*</th>
<th>VA</th>
<th>Total</th>
<th>Weighted count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>74.4%</td>
<td>10.4%</td>
<td>1.9%</td>
<td>4.9%</td>
<td>8.4%</td>
<td>100.0%</td>
<td>124,052</td>
</tr>
<tr>
<td>2013</td>
<td>66.5%</td>
<td>16.8%</td>
<td>2.0%</td>
<td>5.3%</td>
<td>9.5%</td>
<td>100.0%</td>
<td>515,921</td>
</tr>
<tr>
<td>2014</td>
<td>60.8%</td>
<td>20.6%</td>
<td>2.4%</td>
<td>5.1%</td>
<td>11.2%</td>
<td>100.0%</td>
<td>555,358</td>
</tr>
<tr>
<td>2015</td>
<td>65.9%</td>
<td>18.9%</td>
<td>1.9%</td>
<td>3.3%</td>
<td>10.1%</td>
<td>100.0%</td>
<td>667,255</td>
</tr>
<tr>
<td>2016</td>
<td>63.6%</td>
<td>21.5%</td>
<td>2.1%</td>
<td>2.7%</td>
<td>10.1%</td>
<td>100.0%</td>
<td>760,591</td>
</tr>
<tr>
<td>2017</td>
<td>58.6%</td>
<td>26.6%</td>
<td>2.2%</td>
<td>2.6%</td>
<td>10.0%</td>
<td>100.0%</td>
<td>762,629</td>
</tr>
<tr>
<td>Q1:2018</td>
<td>56.6%</td>
<td>29.9%</td>
<td>3.5%</td>
<td>NA</td>
<td>10.0%</td>
<td>100.0%</td>
<td>132,673</td>
</tr>
</tbody>
</table>

* Unable to identify RHS loans as HMDA data for 2018 not yet available

Source: Dare are for largest 73 CBSAs and consist of 8.5 million sale transaction study covering 5-years of home price appreciation (HPA) for 41,000 census tracts. Weighting based on HMDA. Shares based on count. Low & med-low price tiers defined respectively as <=40th & >40th to <=80th percentile of FHA sales prices & med-high & high price tiers defined respectively as >80th percentile of FHA sales prices & <= 125% of GSE limit & > 125% of GSE limit, all at county-level. HPIs are smoothed around the times of FHFA loan limit changes. Data for RHS are not available in years for which HMDA data has not yet been published.

Source: AEI, Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing).
Scatterplots: Introduction

There is a strong positive correlation between higher mortgage risk (higher expected default rates under stress) and higher home price appreciation, lower home prices, and lower income.

The scatter charts on the two slides that follow show correlations at the census tract level relating to mortgage risk which measures expected default rates under stress (x-axis) and:

• The ratio of tract home price appreciation (HPA) to county HPA,
• Income as a percent of metro area income.

The scatterplots are binned to better show the trend. Instead of a standard scatterplot, which plots all the data points, the binned scatterplot only plots the binned data points.

The scatter dots for each chart are color coded based on the percentage of high risk purchase loans as a share of all purchase loans in the tract.

• Those from the green color palette have a high risk share of less than 30%.
• Those from the blue color palette have a high risk share of greater than or equal to 30%.

Source: Data are for largest 73 CBSAs and consist of 8.5 million sale transaction study covering 5-years of home price appreciation (HPA) for 41,000 census tracts. 
House price appreciation increases with a census tract’s mortgage risk index:

- **For the dark green dots (MRI < 15%), the median ratio of tract to county house price appreciation is 0.86**
- **For the dark purple dots (MRI ≥ 60%), ratio is 1.19—a 38% higher level of price appreciation**

*Together the blue color palette tracts (MRI ≥ 30%) represented about 50% of all sale transactions.*
Strong Positive Correlation Between Mortgage Risk & Tract Income

- Dark green dots on the right, with <15% high risk loans, had low average tract MRIs (about 3-6%)
- and dark purple dots on the right, with >=60% high risk loans, had high tract MRIs (about 17-23%)
- For the dark green dots, the median tract income was 158% of metro area income, while for the dark purple dots, the median tract income was 89% of metro area income
- 75% of the census tracks with median income below 120% of metro area income had average tract MRIs of 9% or greater

Note: Instead of a standard scatterplot, which plots all the data points, the binned scatterplot only plots the binned data points. It first groups the x-axis variable into equal-sized bins and then computes the mean of the x and y-axis variables within each bin thereby simplifying the plot while keeping the relationship between x and y variable intact. High risk loans are defined as loans with a Mortgage Risk Index ≥12%.

Source: AEI, Center on Housing Markets and Finance, www.AEI.org/housing
Measured Steps Now Would Moderate Unsustainable Home Price Increases, Not Lead to Home Price Declines

Unlike FHA, rural housing services (RHS) has not moved out risk curve during boom 2.0, keeping housing more affordable for RHS buyers. RHS’ stressed default rate is unchanged over the last 5+ years, while FHA’s First-Time Buyer (FTB) risk index has increased from 21.5% to 27.5%. (The same increases apply to other FHA risk indices.)

<table>
<thead>
<tr>
<th></th>
<th>Median downpayment</th>
<th>Median saleprice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July 2013</td>
<td>July 2018</td>
</tr>
<tr>
<td>RHS</td>
<td>-$2,100</td>
<td>-$900</td>
</tr>
<tr>
<td>FHA</td>
<td>$4,300</td>
<td>$3,700</td>
</tr>
</tbody>
</table>

Source: AEI Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing).
DTIs have been shifting higher as the rise in house prices has been outpacing income gains. The credit easing race between the GSEs and FHA continues. After Fannie (and Freddie) eliminated compensating factors in July 2017, virtually all GSE borrowers, not just those around the previous DTI limit of 45 percent, have shifted to higher DTIs. We expect FHA volume to continue to shift to higher DTIs.

Despite Fannie’s announcement in March to update its Desktop Underwriting after it had first raised the DTI limit to 50 in August 2017, there is little evidence that it has actually reigned in this segment. Compared to Feb-2018, the pullback was minor and the share of loans with a DTI in excess of 44 is still much greater than just a year ago.
Changes in the >95% CLTV Purchase Loan Market

While FHA continues to dominate this market segment with a 72% share, this is down from a 85% share in Jan. 2017. Fannie continues its dominance over Freddie, coming in at a 20% share, up from 12% in Jan. 2017, compared to Freddie’s 8%, up from 3% in Jan. 2017. This is contributing to Fannie’s Risk Index sprinting ahead of Freddie’s.

RHS Reduced Borrower DTIs from 2013 to 2018, while the FHA Kept Increasing DTIs

*DTIs limits act as counter-cyclical friction to slow the increase of house prices when supply is tight. Remove the friction and house prices increase, fueling a boom.*

Not updated

**Source:** AEI Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing).
The FHA’s and the GSEs’ Rising DTIs Have Been Pro-Cyclically Fueling the House Price Boom

Under QM, their credit boxes allow for DTIs well above 43%. As a result, DTIs have increased dramatically. It is the use of compensating factors that reduces risk layering, which is an important policy during a boom. However, the use of compensating factors has been reduced markedly.

Purchase Loans by DTI Bin: February 2013

- In 2013 FHA appears to have had a semi-hard stop at 50% DTI.
- In 2013 the GSEs had a semi-hard stop at 45% DTI.
- FHA also allowed many DTIs up to 57% with limited use of compensating factors.

Purchase Loans by DTI Bin: February 2018

- FHA was also acting pro-cyclically. DTIs >43% increased from 37% of loans in 2013 to 55% in 2018. Those >50% up to 57% more than doubled to 27%. There is no strong evidence indicating the use of compensating factors.
- Over 2013-2018 the GSEs were pro-cyclically fueling the boom. DTIs >43% increased from 13% in 2013 to 27% in 2018.
- The GSEs' requirement for compensating factors was removed in 2017. As a result, DTIs >45% up to 50% increased from 3.5% of loans to 19%.

Shift in GSE market share from large banks to nonbanks may be resuming. The large-bank share has dropped below 30% appears to be in decline. Banks (both large and other) have a lower GSE risk profile than nonbanks.

Note: Data for most recent months may understate large-bank share by perhaps 2 percentage points, as large banks are slower to move recent originations to the guarantee agencies for securitization and our market shares are based on securitized loans. MRIs for credit unions and state housing agencies are not shown because of low loan volumes.

*Origination shares do not show shares for State Housing Finance Agencies or Credit Unions which account for about 5% of the GSE Purchase market. Source: AEI Center on Housing Markets and Finance, www.AEI.org/housing.
The dramatic market shift from large banks to nonbanks for FHA loans appears to have abated due to greater risk appetite from large banks. Migration to nonbanks has boosted overall risk level, as nonbanks are willing to originate riskier FHA loans than large banks.

Origination Shares*  

Mortgage Risk Indexes

Note: Data for most recent months may understate large-bank share by perhaps 2 percentage points, as large banks are slower to move recent originations to the guarantee agencies for securitization and our market shares are based on securitized loans. MRIs for credit unions and state housing agencies are not shown because of low loan volumes.

*Origination shares do not show shares for State Housing Finance Agencies and Credit Unions which account for about 4% of the FHA Purchase market.

Shift away from large banks in GSE refi market has mirrored that in GSE purchase market. Banks (both large and other) have lower risk profile than nonbanks.

Note: Data for most recent months may understate large-bank share by perhaps 2 percentage points, as large banks are slower to move recent originations to the guarantee agencies for securitization and our market shares are based on securitized loans. MRI for state housing agencies not shown because loan volume is nil.

*Origination shares do not show shares for State Housing Finance Agencies and Credit Unions which account for about 3% of the GSE Refi market.

Origination Shares and MRIs by Issuer Lender Type, FHA Refinance Loans

Massive shift from large banks to nonbanks in FHA refi market. Nonbanks now have 93% of the market, along with a higher risk profile than large banks.

Refi Origination Shares*

Refi Mortgage Risk Indexes

Note: Data for most recent months may understate large-bank share by perhaps 2 percentage points, as large banks are slower to move recent originations to the guarantee agencies for securitization and our market shares are based on securitized loans. MRI for state housing agencies and credit unions not shown because loan volume is nil.

*Origination shares do not show shares for State Housing Finance Agencies and Credit Unions which account for about 1% of the FHA Refi market.
The share of FHA purchase loans in a state is heavily correlated with overall lending risk. FHA, as the riskiest lender by far, is accounting for a significant portion of risk, but is also moving the risk curve out for other agencies.
The states with the largest FHA and greatest risk levels have experienced faster growth in risk. All but three states have seen their risk levels increase over the past 5 years.

Not updated

The GSEs find themselves in a multi-faceted competitive situation

At one end is the FHA which neither prices nor underwrites for risk

At the other end, the GSEs have risk-based loan level fee adjustments and private mortgage insurers are required to hold capital in a manner that more accurately reflects risk

− The recently implemented PMI premium changes lowered cost for borrowers with higher credit scores (>720) and increased cost for borrowers with lower credit scores (<700)

To meet affordable housing goals in this difficult competitive environment, the GSEs are resorting to heavy subsidies

− However, stiff competition from FHA and due to the new PMI premium structure, the GSEs have been forced to fill affordable housing quotas with higher credit score loans (median of 737)
DTIs have been shifting higher as the rise in house prices has been outpacing income gains. The credit easing race between the GSEs and FHA continues. After Fannie (and Freddie) eliminated compensating factors in July 2017, virtually all GSE borrowers, not just those around the previous DTI limit of 45 percent, have shifted to higher DTIs. We expect FHA volume to continue to shift to higher DTIs.
The July Agency FBMRI stood at 16.6%, up 0.6 ppt from a year earlier. The Agency FBMRI is 7.4 ppts. higher than the mortgage risk index for repeat buyers, 0.5 ppt. wider than the gap a year earlier. Given supply constraints and absent a triggering event, we expect house prices and leverage to continue to rise for FTBs.

Note: Calculated for primary owner-occupied home purchase mortgages.
Compared to an identical purchase loan, refis have higher stressed default rates across all CLTV buckets. Cash-out refis are even riskier than no-cash-out refis. At its current level, the average CO is as risky as a >90% purchase loan and the average NCO is as risky as a mix of 81-90% and >90% purchase loans. Reasons: weakness of appraisal process and borrower self-selection.

Note: All stress default rates computed for credit score of 720-769 and DTI of 39-43%.
For agency market as a whole, median downpayment is small (5%, $10,700)

Median is even smaller for first-time buyer loans, especially for Ginnie loans (1.8%, $2,800). Ginnie accounts for almost 60% of agency first-time buyer volume.

Traditional 20% downpayment is the norm only for Fannie/Freddie repeat buyers. Ginnie repeat buyers typically put down barely more than first-time buyers.

Hence, in today’s market, little saving or accumulated equity is needed to buy a home, particularly a first home.
As prices have been rising, dollar volume has been outgrowing count volume. Credit easing, particularly by the FHA, is fueling this trend. This creates a vicious cycles of price appreciation and credit easing. 

Solution: dial back flow of money into housing system.

As expected, RHS’ purchase volume jumped immediately after its MIP cut in October 2016. Since the cut, RHS has grown faster than FHA, its most direct competitor. In January, its growth surpassed all other agencies.

In our last NMRI briefing we wrote that in response to higher rates “refi volume could drop by 40% to 150,000 per month.” In January refi volume was down 40% from its peak in October. Refi demand, especially no-cash outs, and the mortgage rate are strongly correlated.

Fannie’s low-risk (prime) share has dropped below 50% for the first time in the history of the series. The low risk percentage gap between Fannie and Freddie is also the widest in series history. VA’s low-risk share is well below the GSEs’. 

Calibrating Mortgage Safety

- NMRI captures the complex interplay of changes in three types of leverage: property (LTV and term), income (DTI, ARM vs. FRM, and term), and credit score.
- Composite index substantially above 1990 level, but not approaching 2007 level when underwriting was exceptionally lax.
- Fannie/Freddie index somewhat above 1990 level.
- FHA index is extremely high. Sharp contrast with safe underwriting during 1935-55.
- VA index less than half the level of FHA, both recently and in 2007.

<table>
<thead>
<tr>
<th>NMRI – purchase loans</th>
<th>Latest date</th>
<th>Latest Value</th>
<th>1935-1955 vintages (est.)</th>
<th>1990 vintage (est.)</th>
<th>2007 vintage (est.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite index</td>
<td>Jul</td>
<td>12.8%</td>
<td>NA</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>Fannie and Freddie</td>
<td>Jul</td>
<td>7.3%</td>
<td>NA</td>
<td>4%</td>
<td>13%</td>
</tr>
<tr>
<td>FHA</td>
<td>Jul</td>
<td>28.0%</td>
<td>3%</td>
<td>15%</td>
<td>33%</td>
</tr>
<tr>
<td>VA</td>
<td>Jul</td>
<td>11.9%</td>
<td>NA</td>
<td>NA</td>
<td>15%</td>
</tr>
</tbody>
</table>

An index value of less than 6 is indicative of conditions conducive to a stable market.
## Credit Conditions: 1990 to 2013-14

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% Loans with DTI ≥ 42%</td>
<td>5-10%</td>
<td>28% (2003)</td>
<td>43% (2007)</td>
<td>28%</td>
</tr>
<tr>
<td>Median borrower credit score</td>
<td>735</td>
<td>701</td>
<td>705</td>
<td>735-740</td>
</tr>
<tr>
<td>% Loans with credit scores &lt; 640</td>
<td>9.5%</td>
<td>25%</td>
<td>NA</td>
<td>5%</td>
</tr>
<tr>
<td>% Loans with CLTV &gt; 90%</td>
<td>26%</td>
<td>35%</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>% Loans with CLTV ≥ 97%</td>
<td>1%</td>
<td>11%</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>% Loans Low/No Doc</td>
<td>Nil (1992)</td>
<td>6% (2000-02)</td>
<td>25%</td>
<td>Nil</td>
</tr>
<tr>
<td>30-year fixed interest rate</td>
<td>10% (1990)</td>
<td>7% (2001)</td>
<td>6.5% (2006)</td>
<td>4% (2013)</td>
</tr>
<tr>
<td>First-time buyers as % of primary home purchase mortgages</td>
<td>38-42% (1990)</td>
<td>NA</td>
<td>NA</td>
<td>50%</td>
</tr>
<tr>
<td>Perfect credit (no lates) as a % of home purchase borrowers</td>
<td>57-60% (1990)</td>
<td>NA</td>
<td>NA</td>
<td>60%</td>
</tr>
<tr>
<td>NMRI</td>
<td>6%</td>
<td>NA</td>
<td>19%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Compiled by AEI. Sources: CoreLogic for DTI data for 2000-03 and 2005-07 and median credit score for 2005-07. Other data from AEI, Fannie Mae, FHA, Equifax, Freddie Mac, FICO®, and miscellaneous other sources. In general, figures shown are for the entire purchase loan market (conventional and government guaranteed). John Burns (John Burns Real Estate Consulting) collaborated on the presentation format.

- Clear buildup of risk from 1990-92 to 2005-07
- 2013-14 loan cohort less risky than 2005-07 cohort due to smaller percentage of loans with high DTIs, higher median credit score, and very few low/no doc loans
- Still, 2013-14 cohort is substantially riskier than 1990-92 cohort. Main differences are sharp increase in loans with high CLTVs and high debt ratios, notwithstanding much lower interest rates
Role of Income Leverage During Housing Boom

• Less attention paid to income leverage than to property and credit leverage
  – Owes to data scarcity, as the FHA and GSEs published virtually no DTI data until 2013, when FHFA released DTI trends for the period 1996 onward for both the GSEs and FHA

• Over 1996-2005, higher income leverage raised overall home purchase buying power 46%, three-quarters of the 62% rise in real home prices*
  – GSE median housing DTIs (purchase transactions): 23% in 1996, 27% in 2005 — 17% boost in buying power (based on 8% interest rate for both years)
  – Median loan rates fell from 8% in 1996 to 6% in 2005 — 20% added boost in buying power
  – Low doc/no doc loan share was near 0% in 1996 with minimal income overstatement. By 2005, share was 15% with 25% income overstatement (source: CoreLogic). This increased housing DTI in 2005 another percentage point to 28% (4% added boost in buyer power).

• Push/pull of increasing leverage at work today
  – Home Prices Start to Heat Up: Double-digit growth arrives in more cities, but affordability worries emerge amid thin supply (WSJ, May 12, 2015)

• NMRI tracks changes in income leverage
  – Since Nov. 2012, median total DTI for all agency primary purchase loans increased from 36% to 38%, leaving buyers more highly leveraged even as income volatility increases: Cash Crunch Is, for Many, a Monthly Problem (WSJ, May 20, 2015)

* Does not take into account increases in income, home size or quality. Ex. the median new home size increased 14% from 1996 to 2005.
Fed Tightening and Efforts to Maintain Buying Power

• Historical precedent: end of the Fed’s interest rate peg in effect from World War II
  – Long-term mortgage rate rose from 4.1% in 1953 to 6% in 1962
  – 5 amendments to National Housing Act (1954-61) increased FHA’s LTV and loan term limits
  – These changes, along with rising housing DTIs, kept buying power constant from 1953 to 1962

• Today: with the Fed now starting to tighten, long-term interest rates will rise
  – All else equal, a rise in the 30-year mortgage rate from 4% to 6% would reduce buying power by the same amount as a 19% jump in home prices

• Two steps would keep buying power largely constant with no change in income-to-house price ratio
  – Reduce FHA’s annual premium an additional 35 basis points to 0.50% (requires action by FHA and would further stress FHA’s capital level)
  – Boost median total DTI from 41% today to 45% for FHA and from 34% today for GSEs to 38%. These changes would be QM compliant due to the agency QM exemption.

• Very risky steps. Would result in median total DTI for FHA well above the peak level in 2005-06 and for GSEs equal to the 2005-06 peak level.

• Wealth Building Home Loan provides a sustainable alternative

*FHFA’s 2014 fee report indicates that the GSEs were undercharging on high risk loans and overcharging on low risk ones and that overall guarantee fees were lower than needed to meet capital return levels. This is equivalent to a hidden guarantee fee cut and could be repeated in the future.
An appraisal should provide an opinion as to the relationship between market selling price and intrinsic or fundamental value

- Property valuations and appraisals should review and provide:
  - A robust and transparent opinion of a property’s most likely market price based on a systematic analysis of generally available information rather than 3 subjectively chosen comparison properties
    - Including a range around the most likely market price at a specified confidence level
  - Trends in and nearness to key elements of utility such as employment, shopping, transportation, other infrastructure and amenities, along with zoning, density restrictions, and tax burden that impact intrinsic value and market price
  - Market conditions and an assessment of whether a substantial differential between a property’s intrinsic value and market price is substantiated by a change in utility:
    - At least 10-year nominal and real home price trends and a determination as to current position in market cycle relative to equilibrium
    - At least a 5-year history of buyer’s market (inventory > 6 mo.) and/or seller’s market ( ≤ 6 mo.)
  - Impact on buying power over last 5 years due to changes in loan leverage or prevailing interest rates
  - Current land value and land share, and trends in both
  - Whether real price changes are due to leverage growth, improving utility or a combination
  - A property’s overall condition and a recommendation as to any readily observable repairs necessary to make it meet generally accepted minimum property requirements
Cross-subsidies Return to the GSEs

- FHFA’s Report on Single-Family Guarantee Fees in 2014 disclosed numerous instances of mispricing and cross-subsidies, a significant deviation from 2013 report\(^1,2\)
  - High risk 30-year loans subsidized by low risk 15-years
  - Borrowers with low credit scores scores subsidized by those with high credit scores
  - High LTV loans subsidized by low LTV loans
  - Overall guarantee fee levels were found insufficient to meet the estimated future cost of providing the guarantee

- Mispricing promotes adverse selection and increases overall risk of mortgage finance system
  - Allows the GSEs to implement guarantee fee cuts in an opaque manner
  - Ability to subsidize risky loans will cause progressive loosening of underwriting standards
  - As was the case the last time around, this movement out the risk curve may take 5-10 years

- NMRI is designed to track these risks in real time


Since April 2016 the GSEs have again overtaken FHA as the fastest growing agencies indicating that FHA MIP cut effect from January 2015, which led to massive poaching and some new homebuyers, has worn off.

FHFA Director Mel Watt stated that with use of compensating factors “loans with a 3 percent down payment backed by GSEs are no riskier than those with a down payment of 10 percent …” (Jan. 27, 2015). Based on NMRIs, this is not true.

Full use of compensating factors would imply ratios of 100%

Fannie accounts for the vast majority of GSE loans with CLTVs > 95%
FICO’s minimum scores are near the bottom of the FICO credit score distribution. An FHA borrower with a 500 credit score has an NMRI of 50%, twice as risky as today’s median FHA loan and eight times riskier than today’s median GSE loan.

Source: AEI Center on Housing Markets and Finance, www.AEI.org/housing, from FICO 8 score distribution for October 2014. Distribution for FICO scores of 300-800 and 850 directly from FICO; distribution between 800 and 850 interpolated by Edward Pinto.
Median Credit Score on Primary Purchase Loans*

*Data pertain to purchase loans for primary owner-occupied properties. Percentiles based on population of all scorable individuals. Source: AEI Center on Housing Markets and Finance, www.AEI.org/housing

Median scores about unchanged from January 2017. FHA’s all-buyer median at 34th percentile of scored distribution, with room to drop given FHA’s minimum scores. In current seller’s market, this will boost home prices faster than income.
Aggregate default risk (which measures the combined effect of loan-level risk and volume) continues to rise. FHA continues to account for more than half of the aggregate agency risk.
The Effect of April 2016 PMI Price Change

Pricing for risk matters. GSE pricing for higher credit scores are now competitive with FHA, which is reflected in changes to market shares. It has also led to GSE gaining a greater share of lower risk FHA borrowers.

Stark contrast between credit score distributions for FHA and GSE borrowers. FHA accounts for over 80% of scores below 660, while GSEs account for nearly 90% above 740.

MRIs rise as credit scores decline – evidence of risk layering rather than compensation for risk. In a seller’s market, risk layering artificially pushes up prices, resulting in a wealth transfer from buyers to sellers of entry-level homes.
Purchase Loans with Down Payment of 5% or Less*

57% of all primary purchase loans and 35% of such Fannie/Freddie loans have a minimal down payment. With QM silent on down payments, lots of room for these shares to rise. In current seller’s market, this will drive up home prices more than income.

*Data pertain to purchase loans for primary owner-occupied properties. Source: AEI Center on Housing Markets and Finance, www.AEI.org/housing
Update - Effect of FHA Mortgage Insurance Premium Cut

- FHA's Jan. 2015 MIP failed to live up to its billing because it was undertaken during a seller’s market. Implementation of FHA’s suspended MIP cut would likely have a similar outcome because of the even stronger seller’s market today. Our research addresses two questions:

- **Question 1**: How did FHA borrowers use the 6% in additional buying power?
  - Analyzed this question with data from ATTOM Data Solutions and other sources
  - Separated the market into areas with high and low FHA presence, which allowed for a more robust comparison of impact on FHA and Conventional buyers
  - The price of FHA financed homes rose by 2.5% vis-à-vis conventionally financed homes (after accounting for changes to the borrower pool). This implies FHA borrowers only saved slightly more than half of the MIP cut.
  - The entire effect was capitalized into higher constant-quality prices—effectively a tax on FHA and many conventional buyers:
    - The average price paid by FHA borrowers amounted to $5,100 - $5,800 more for the exact same house.
    - As a result, FHA borrowers used nothing of the MIP cut to improve the quality of their purchase
    - Conventional borrowers competing with FHA borrowers in the same markets largely matched the increase in house prices by reducing the quality of their purchase.

- **Question 2**: How accurate was FHA’s prediction that the cut would spur 250,000 first-time buyer (FTB) home purchases over the coming 3 years (≈ 83,000/year)?
  - FHA's volume increased about 217,000 in 1st year after MIP cut. Using the NMRI data, we estimate that roughly:
    - 20,000 (9%) were homebuyers brought in by the MIP cut, of those only about 17,000 were FTBs or 20% of projection
    - 117,000 of these loans (over half) were poached from the other Agencies
    - 80,000 (37%) represented market trend growth unrelated to the MIP cut
  - Upshot: FHA fell far short of goal despite big rise in [largely poached] total FTB volume
Retail share has increased to 47%, with offsetting decline in correspondent share. Broker share has remained around 10%. Correspondent and broker composite MRIs tracking higher at levels significantly above retail MRI.
Nearly all large-bank volume comes through retail and correspondent channels; broker volume has dropped to de minimis level. MRI shows that large banks are acting to limit defaults among retail customers and reducing risk tolerance on correspondent loans.*

*Sharp drop in MRI for broker channel is due to greatly reduced volume of GNMA loans.
Fed’s Senior Loan Officer Survey is Badly Flawed

- Showed no systematic loosening in mortgage lending standards in the run-up to the 2007-08 financial crisis

- Survey design problems
  - Only covers commercial bank lenders
  - Based on opinions of a small number of loan officers
  - Weights all responses equally

- Results over past year: some easing for GSE loans, little change for Ginnie loans. Survey misses the caution prevailing at banks revealed by NMRI (see table).

- Mortgage lending standards have eased but this is due to mix shifts not captured by the survey (from banks to nonbanks and from GSEs to FHA).

- Bottom line: don’t use the Fed survey

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>All banks</td>
<td>Some easing</td>
<td>Some easing</td>
</tr>
<tr>
<td>GSEs</td>
<td>Some easing</td>
<td>Some easing</td>
</tr>
<tr>
<td>FHA, VA, and RHS</td>
<td>Some easing</td>
<td>Little change</td>
</tr>
</tbody>
</table>

Note: “Easing” denotes a rise in the NMRI of 0.25 percentage point or more, “Tightening” denotes a decline in the NMRI of 0.25 percentage point or more, and “Little change” denotes a change in the NMRI of less than 0.25 percentage point in either direction.

Urban Myth: Tight Credit Keeping “Creditworthy” Borrowers Out of Market

- **Assertion:** “Today’s lenders are simply not originating loans for borrowers with less than perfect credit.” (Urban Institute, April 2015)
  - **Fact:** 40% of home purchase borrowers in 2013-14 had less than perfect credit (perfect being no lates)
  - **Fact:** Median credit score for FHA purchase loans was 674 in April 2015, well below the median for all individuals in U.S. with a score
- **Assertion:** “Severe” 2013 standards caused 1.25 million purchase loans to be missing relative to “cautious” 2001 standards
  - **Fact:** 70% of these “missing” borrowers had a credit score < 660; would have an MRI above 25% due to extensive risk layering on FHA loans
  - **Fact:** Urban study is fatally flawed. Credit score distribution was the same in 2005 as in 2001, so the number of “missing” loans would be the same using either year as the baseline. Because credit standards in 2005 were extremely lax, this makes the notion of “missing loans” meaningless
  - **Fact:** Credit standards in 2001 were much looser than in the early 1990s. Thus, the early ’90s would be a more appropriate baseline for cautious standards.

---

2 In addition to subprime credit score, initial equity of 3% or less, 30 year loan term, average total debt ratio of 41% without use of residual income.
3 A 1999 Urban Institute study ([http://www.urban.org/publications/1000205.html](http://www.urban.org/publications/1000205.html)) documented the easing of standards by the GSEs through 1998 but also noted that “The GSEs’ guidelines, designed to identify creditworthy applicants, are more likely to disqualify borrowers with low incomes, limited wealth, and poor credit histories; applicants with these characteristics are disproportionately minorities.” HUD relied on this study when it greatly expanded the affordable housing goals in 2000.
FHA Perpetuates This Myth

• FHA promotes lending to very high-risk borrowers: credit score floors of 500 with 10% down and 580 with 3.5% down

• 2007 vintage of FHA loans indicative of performance under stress

| FHA’s 2007 Loan Cohort: 90-day Delinquency Rate by Credit Score |
|-------------------------|----------------|----------------|----------------|----------------|
| ≤ 620                   | 620-650        | 650-700        | 700-750        | >750           |
| 47%                     | 35%            | 25%            | 14%            | 9%             |

Source: Urban Institute, VA Loans Outperform FHA Loans. Why? And What Can We Learn?, table 3, panel B

• FHA charges the same mortgage insurance premium regardless of borrower credit risk. Lack of risk-based pricing:¹
  – Misleads high-risk borrowers into thinking they are creditworthy
  – Exposes FHA to adverse selection
  – Is inherently unfair
  – Increases overall risk of mortgage finance system.

• AEI’s Wealth Building Home Loan offers a better solution for higher-risk borrowers

¹For a detailed analysis of the value of credit scoring and risk-based pricing for promoting a fair and efficient mortgage market, see Board of Governors of the Federal Reserve System, Report to the Congress on Credit Scoring and Its Effects on the Availability and Affordability of Credit, August 2007, www.federalreserve.gov/boarddocs/rptcongress/creditscore/creditscore.pdf
Moral hazard: “A situation where one party gets involved in a risky event knowing that it is protected against the risk and the other party will incur the cost.”

• FHA insurance presents a classic case with multiple layers of moral hazard:
  – FHA insures 100% of the loss for high-risk loans, has minimal capital, and is taxpayer backed
    o It neither prices for risk nor underwrites for risk layering, which is inherently unfair to borrowers and exposes FHA to adverse selection.
    o Exact opposite of the original FHA structure in the 1934 National Housing Act
  – Ginnie Mae and nonbank lenders, both with minimal capital, are able to ignore borrower solvency risk since they are protected by FHA
  – High-risk borrowers, misled into thinking they are creditworthy, borrow more than they should. Greater borrowing spurred by recent cut in mortgage insurance premium is a textbook example.
  – Increases overall risk of mortgage finance system
    o Effectively unconstrained by QM, increasing competition between Fannie and FHA, and eventually Freddie, will cause progressive loosening of underwriting standards
    o As was the case during the last boom/bust cycle, this movement out the risk curve may take 5-10 years
• NMRI is designed to track these risks in real time

1http://economictimes.indiatimes.com/definition/moral-hazard
2For a detailed analysis of the role risk-based pricing plays in promoting a fair and efficient mortgage market, see Board of Governors of the Federal Reserve System, Report to the Congress on Credit Scoring and Its Effects on the Availability and Affordability of Credit, August 2007, www.federalreserve.gov/boarddocs/rptcongress/creditscore/creditscore.pdf
3QM as implemented does not constrain leverage (LTV/CLTV, credit score, or total DTI). It does constrain loan term, but at a highly levered 30 years. The rest of QM is largely window dressing (except for the current 5 year fully indexed requirement on ARMs). For example, FHA has had full doc and fully amortizing loans since its inception. This did not prevent 1 of 8 (3.4 million) of its borrowers going to claim from cohort years 1975-2013.
While FHA’s Capital Reached Required 2% Statutory Level for 1st Time since 2008, It Is Insufficient

**Mutual Mortgage Insurance Fund at 2.07% in FY 2015 compared to 0.41% in FY 2014. A further reduction in insurance fee is unjustified and counter productive.**

- Impact of premium cut was minimal as most of the gain since FY 2014 projection was due to FY 2015 volume gain which was offset dollar for dollar by reductions in mortgage insurance premiums.
  - Volume gain was largely due to poaching, mostly from Fannie and RHS, and an improving economy.
  - Most of the increase in buying power was capitalized into the purchase of higher priced homes.
  - Higher home price projection vs. FY 2014 projection also added to economic value.
    - Home prices are assumed to continue to increase faster than incomes for foreseeable future.
  - 36% of FY 2015 volume in CA, FL and AZ (traditionally volatile states) along with TX (has high house-price risk), up from 28% in FY 2010.
  - Premium cut substantially reduced FY2021 projected economic value.

- 2% capital level is insufficient.
  - FY 2014 report indicated a 4% capital level more appropriate given that U.S. is already in the 7th year of an economic expansion.
  - FHA not projected to hit a 4% single-family forward loan capital level until the end of FY 2020, at which point the current expansion, were it to continue, would be the longest on record.

- FHA’s MRI continues to hover near 25% and is 37% for loans with credit scores < 660.
  - Extraordinarily high default rate on loans with scores below 660 is an abusive lending practice.
  - These borrowers are disproportionately low-income and minority.
Credit easing trend has stopped in majority of states – SMRI down in about two-thirds of states for agency composite. Contrast between composite and individual agencies has re-appeared as market shares have shifted back to the GSEs after effects of FHA premium cut have worn off.
**CBSA NHMI: Investor Type for Home Purchase Loans**

*FHA has greater presence in lower cost CBSAs, while the Conventional side of the market has greater presence in higher cost CBSAs. FHA, due to its highest risk rating, is driving up risk in these lower cost CBSAs.*

Source: AEI, Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing), and First American Data Tree (DataTree.com).
A metro with very volatile house prices, especially for bottom price tier. Since the Jan. 2012 trough, bottom-tier prices up almost 70%, boosted by liberal credit terms and low rates in a seller’s market.

House prices most volatile in California and Florida metros, moderately volatile in 16 other metros, with 25 metros having low volatility.

Note: Each series shows the percent change from 20 quarters (5 years) earlier. Volatile metros are defined as those for which the difference between the highest and lowest annual percent changes is more than 30 percentage points. All other metros are in the “more stable” group. Source: AEI Center on Housing Markets and Finance, www.AEI.org/housing, using data from Zillow.
Median Values of Risk Factors by Loan Type

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Purchase</th>
<th>No-Cash-Out Refi</th>
<th>Cash-Out Refi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Score</td>
<td>733</td>
<td>731</td>
<td>712</td>
</tr>
<tr>
<td>Total DTI</td>
<td>40</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>CLTV</td>
<td>95</td>
<td>73</td>
<td>75</td>
</tr>
</tbody>
</table>

Note: Calculations based on loans with non-missing data for credit score, DTI, and CLTV. Source: AEI Center on Housing Markets and Finance, www.aei.org/housing.

- Greater riskiness of refi loans for a given credit score, total DTI, and CLTV is offset by tighter lending standards. Refis have:
  - Higher credit scores
  - Lower total DTIs
  - Much lower CLTVs
Risk Shares for Home Purchase Loans

*Loan risk greater than level conducive to long-run market stability, as low-risk loans accounted for only 38% of volume in July, far from comprising the preponderance of loans, which is necessary for long-term market stability.*

For first-time buyers, the April 2018 low-risk prime share was 23%.

Low risk defined as stressed default rate of less than 6%, medium risk near prime is 6% to 12%, and high risk subprime is 12% or higher.

Note. Risk shares pertain to the composite of all purchase loans.
FHA has DTIs as high as 57% and GSEs have some as high as 50%. DTI limits should operate to “take the punch bowl away” before a leverage fueled boom goes too far. But the current DTIs maximums are so high as to present no such constraint.

For FHA, MRIs rise with DTIs – evidence of risk layering. The same is true for the GSEs up to a DTI of 45%; they compensate for risk on only the very highest DTI loans.

*Data pertain to purchase loans for primary owner-occupied properties.
Cash-outs accounted for 63 percent of total refis in April, more than triple the share at start of the series, owing in part to greater home equity. Temporary spike down early last year was due to a surge in no-cash-outs from FHA premium cut and a drop in mortgage rates. Recent spike is due to a large decline in no-cash-outs from higher mortgage rates while the demand for cash-outs has remained relatively stable.

As cash-out share has grown, its agency composition has also changed. Compared to the series’ start, VA and FHA have tripled their share by loosening lending standards faster than the GSEs. Today, they account more over half of the expected defaults, up from just 20%.

### Market Share

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Composite</td>
<td>6.3%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Fannie Mae</td>
<td>5.2%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Freddie Mac</td>
<td>5.5%</td>
<td>9.8%</td>
</tr>
<tr>
<td>FHA</td>
<td>19.3%</td>
<td>26.0%</td>
</tr>
<tr>
<td>VA</td>
<td>16.1%</td>
<td>21.4%</td>
</tr>
</tbody>
</table>

### Expected Defaults under Stress

Nonbank’s correspondent share has been increasing at the expense of retail and broker. While the MRIs of all three channels are increasing, the correspondent channel has the highest MRI and has increased the most.

In the past, increasing leverage has fueled unsustainable house price trends. Since the advent of expanded “affordable housing” efforts, these trends have become stronger at the lower end of the market, as indicated by the higher peaks and lower troughs. Since 2012, a similar boom pattern has emerged.

As a result of affordable housing policies, low tier homes become more scarce in a seller’s market and more plentiful in a buyer’s market. Leads to divergent price trends with low tier exhibiting much greater price volatility than medium and high tiers in both up and down markets.

1993: GSE affordable housing goals take effect as mandated by the 1992 Housing Enterprises Safety and Soundness Act.

1993-2006: period of credit easing and generally falling mortgage rates.

2012 to date: easing loan standards, very loose Fed policy, and historically low mortgage rates (73rd month of seller’s market).

Tiers price breakouts are calculated by breaking up all sales for each period, so that there are the same number of sales, after accounting for exclusions, in each of the three tiers. These 16 metro areas are used to derive the Tiered HPI: Boston, NYC, DC, Chicago, Denver, Las Vegas, Los Angeles, San Diego, San Francisco, Miami, Atlanta, Minneapolis, Phoenix, Portland, Seattle, and Tampa. Only 8 metro areas included at beginning of series. This number grows until 1993, when 16 metro areas are consistently reported.

* A seller’s market: an economic situation in which goods are scarce and sellers can keep prices high. (Google.com)

**A buyer’s market: an economic situation in which goods are plentiful and buyers can keep prices down. (Google.com)
Today’s 21 quarters look to constitute the early part of an extended housing boom. Sustained periods with few price declines allow market excesses to build and may lead to a Minsky Moment.** Unsustainable increases in entry-level home prices result in speculation in land, the more volatile part of the structure/land package.

**Minsky moment** is a sudden major collapse of asset values which is part of the credit cycle or business cycle. Such moments occur because long periods of prosperity and increasing value of investments lead to increasing speculation using borrowed money. Wikipedia

Source: FHFA Quarterly House Price Index and AEI Center on Housing Markets and Finance

*Only 30 metros included at beginning of series. This number grows until 1977Q4, when 81 metros are consistently reported.

**A Minsky moment is a sudden major collapse of asset values which is part of the credit cycle or business cycle. Such moments occur because long periods of prosperity and increasing value of investments lead to increasing speculation using borrowed money. Wikipedia
Portfolio jumbo rate has been below the GSE rate since 2014, reversing prior pattern. The reasons are an increase in the GSE guarantee fees but also lenders may be bidding aggressively for jumbo loans to obtain low-risk assets with cross-selling opportunities.

<table>
<thead>
<tr>
<th>Period</th>
<th>Spreads in bps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2006</td>
<td>25</td>
</tr>
<tr>
<td>2007-2009†</td>
<td>57</td>
</tr>
<tr>
<td>2010-2013†</td>
<td>21</td>
</tr>
<tr>
<td>2014-2017††</td>
<td>-26</td>
</tr>
</tbody>
</table>

Note 1: Jumbo Portfolio minus GSE and Jumbo PMBS minus GSE spreads (in bps) between 90% and 110% of conforming limit.
Note 2: Chart omits PMBS-GSE spreads for years with less than 200 jumbo PMBS loans. Inset box uses loans for all years, except as indicated by line breaks.
Note 3: Data for 2017 are for January - September only.
Note 4: For loans between 90 percent and 110 percent of the applicable conforming loan limit.

Source: AEI International Center on Housing Risk, [www.aei.org/housing](http://www.aei.org/housing), and CoreLogic.
Homeowners Can’t Count on House Price Gains to Build Wealth

A better approach would be to focus on actual wealth building through widespread adaptation of the Wealth-Building Home Loan (WBHL).

Using zip-level data for top 100 CBSAs to provide most complete analysis to date of risk by price tier

<table>
<thead>
<tr>
<th>Zip codes</th>
<th>Share of zips with decline in house price index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top price tier</td>
<td>28%</td>
</tr>
<tr>
<td>Middle price tier</td>
<td>37%</td>
</tr>
<tr>
<td>Bottom price tier</td>
<td>42%</td>
</tr>
</tbody>
</table>

Note: Top 100 CBSAs are defined by 2010 population. Analysis uses all five-digit zip codes in these CBSAs with a FHFA house price index back to 1990 or earlier and a Zillow median house price in 2000. Zips with a median house price in 2000 in the bottom third, middle third, and top third of all the zips in its CBSA are placed in the bottom, middle, and top price tiers, respectively.

• Prices rose almost everywhere from 1995 to 2005, but many zips saw declines in other periods, especially 2005-2010
• Bottom price tier – where most first-time buyers locate – was worst-performing tier
• These results are for price indices, which average across many homes. Risk for individual homes greater than shown here. WBHL mitigates this risk.

Principle: the only plausible reason for government to back the housing market is to help low- or moderate income families buy homes. An evaluation of the GSEs 2017 business shows, that the GSEs fail to meet this simple test.

Almost half of the GSEs’ 2017 volume wasn’t even related to buying a primary residence. These borrowers could be served by the private sector.

Source: AEI Center for Housing Markets and Finance. All share percentages based on dollars (YTD Aug. 2017)
Another 41% went to help well-to-do buyers, of which 25 percentage points went to well-to-do repeat buyers of primary residences and 16 percentage points went to well-to-do first-time buyers.

These buyers could be served by the private sector.

- **First-time buyer (FTB) w.>85% CLTV & loan>$250,000**
  - 8% share
  - $353,000 med. SP
  - 746 med. FICO

- **FTB w.<85% CLTV**
  - 9% share
  - $280,000 med. SP
  - 752 FICO

- **Repeat buyer w. >85% CLTV & loan >$250,000**
  - 8% share
  - $365,000 med. SP
  - 755 FICO

- **Repeat buyer w. <=85% CLTV**
  - 18% share
  - $327,000 med. SP
  - 774 med. FICO

Source: AEI Center for Housing Markets and Finance. All share percentages based on dollars (YTD Aug. 2017)
Only 6.5% (1 in 16) GSE Dollars went to first-time buyers of more modest homes and only 3.7% (1 in 30) GSE Dollars went to repeat buyers of more modest homes.

The private sector and a targeted and reformed FHA could replace the GSEs over time:

- The private sector could handle the 50% who are not buying a primary residence and the 40% well-to-do repeat & 1st time buyers of primary residences
- The remaining 10% could be handled by the FHA and the private sector

Source: AEI Center for Housing Markets and Finance. All share percentages based on dollars (YTD Aug. 2017)
Update: John Burns Intrinsic Home Values

Over the past year the intrinsic over-valuation of the vast majority of metros has increased – the most in the metros that were already highly valued. Almost 75% of metros tracked by John Burns are overvalued today. These overvalued metros are largely concentrated in CA, NV, FL, and AZ (the Sand States—ground zero in last boom/bust) and CO, TX, OR, and WA (states that largely sat out the last boom/bust).

*Based on HMDA data for 2017.

Note: The Intrinsic Home Value Index shows current price versus intrinsic value assuming 6% mortgage rate. It tracks 131 metros in the U.S. Source: AEI Center on Housing Markets and Finance, www.AEI.org/housing, and John Burns Real Estate Consulting.
GSEs: Large Lender Market Share and Relative Risk Share, Refinance Loans

### Large banks

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<tbody>
<tr>
<td>NMRI</td>
<td>8.6%</td>
<td>9.7%</td>
<td>8.3%</td>
<td>7.8%</td>
<td>8.9%</td>
<td>9.1%</td>
</tr>
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</table>

#### Wells Fargo

#### JP Morgan

#### Flagstar

#### US Bank

#### SunTrust

#### BB&T

#### Fifth Third

#### Bank of America

### Large nonbanks

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<td>9.1%</td>
</tr>
</tbody>
</table>

#### Quicken

#### Loan Depot

#### United Shore

#### Nationstar

#### Pennymac

#### Caliber

#### Amerihome

#### Ditech

#### Franklin American

#### Freedom Mortgage

#### Fairway

#### Stearns

#### Guild

#### Plano

#### Lakeview

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**Larger circle represents larger market share. Lenders shown represent the 8 largest banks and 15 largest nonbanks by origination share in 2016:Q3.**

**Higher FHA risk share (relative to market share)***

**Lower FHA risk share (relative to market share)***

---

**25%+**

**15 to 25%**

**5 to 15%**

**5 to -5%**

**-5 to -15%**

**-15 to -25%**

**-25%+**
FHA: Large Issuer Lender Type Market Share and Relative Risk Share, Refinance Loans

<table>
<thead>
<tr>
<th>Large banks</th>
<th>Not updated</th>
<th>Large nonbanks</th>
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<tr>
<td>2013</td>
<td>21.3%</td>
<td>2013</td>
</tr>
<tr>
<td>2014</td>
<td>21.8%</td>
<td>21.3%</td>
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<tr>
<td>2015</td>
<td>22.4%</td>
<td>21.8%</td>
</tr>
<tr>
<td>2016</td>
<td>23.6%</td>
<td>22.4%</td>
</tr>
<tr>
<td>2017/</td>
<td>24.6%</td>
<td>2017/</td>
</tr>
<tr>
<td>H1</td>
<td>25.0%</td>
<td>Q3</td>
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<tr>
<td>NMRI</td>
<td>25.0%</td>
<td>Oct.</td>
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<tr>
<td>Flagstar</td>
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<tr>
<td>Wells Fargo</td>
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<td>US Bank</td>
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<td>JP Morgan</td>
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<td>SunTrust</td>
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<td>Fifth Third</td>
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<td>BB&amp;T</td>
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<td></td>
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<tr>
<td>Amerihome</td>
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</tbody>
</table>

Larger circle represents larger market share. Lenders shown represent the largest 8 banks and 15 nonbanks by origination share in 2016:Q3.


Flagstar: Not updated
Wells Fargo: Not updated
US Bank: Not updated
JP Morgan: Not updated
SunTrust: Not updated
Fifth Third: Not updated
BB&T: Not updated
Amerihome: Not updated
Quicken: Not updated
Freedom Mortgage: Not updated
PennyMac: Not updated
LoanDepot: Not updated
Nationstar: Not updated
Lakeview: Not updated
Amerihome: Not updated
Caliber: Not updated
Ditech: Not updated
Plaza: Not updated
Stearns: Not updated
United Shore: Not updated
Guild: Not updated
Fairway: Not updated
Franklin: Not updated

25+% 15 to 25% 5 to 15% 5 to -5% -5 to -15% -15 to -25% -25+

Higher GSE risk share (relative to market share) Lower GSE risk share (relative to market share)
Even though the rate of increases have slowed over the past three years, volume is still growing from a high base. Compared to 3 years prior, October 2017 volume by count is up 24 percent; first-time buyer volume is up 30 percent.

Agency Origination Shares by Risk, Purchase Loans

Fannie and, to a lesser extent, Freddie have expanded their holdings of higher risk subprime loans, now accounting for a combined 26 percent of such loans, up from 7.5 percent in Sept. 2012. While Freddie has offset this by adding safer, prime and near-prime loans, Fannie has shed some of its business in these categories. Over the past 6 months, Fannie appears to be changing its positioning as talks of GSE reform heat up.

* We define prime loans as low-risk (with a stressed default rate of less than 6%), near prime as medium risk (with a stressed default rate of 6% to less than 12%), and subprime as high risk (with a stressed default rate of 12% or greater).

All of FHA’s indices have consistently been trending up since early-2013 (earliest data available). For comparison purposes, Rural Housing Services’ Purchase MRI has been flat. Unless FHA makes policy changes, its current credit box will continue to lean into the current housing boom, thereby leading the way in the promotion of unsustainable home price increases.
What explains FHA’s riskiness?

- Across all risk factors FHA is more risky than the rest of the Agency Market.
- Over the past 2 years an increasing share of FHA loans has had higher DTIs and lower credit scores.
- With term and CLTV basically maxed out, further FHA loosening will have to come from subprime credit score borrowers (<660) or higher DTIs.

### Primary Home Purchase Loans

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>FHA</th>
<th>Rest of Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jul-16</td>
<td>Jul-18</td>
</tr>
<tr>
<td>Credit score &lt; 660</td>
<td>35%</td>
<td>44%</td>
</tr>
<tr>
<td>DTI &gt; 43%</td>
<td>44%</td>
<td>57%</td>
</tr>
<tr>
<td>DTI &gt; 50%</td>
<td>17%</td>
<td>27%</td>
</tr>
<tr>
<td>CLTV ≥ 95%</td>
<td>92%</td>
<td>91%</td>
</tr>
<tr>
<td>30-year term</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>% high risk loans</td>
<td>88%</td>
<td>93%</td>
</tr>
</tbody>
</table>

Note: Calculated for primary home purchase loans with a government guarantee and reported risk factor. Source: AEI, Center on Housing Markets and Finance, www.aei.org/housing/.
How wide is the FHA credit box?

FHA borrowers are the marginal borrowers. FHA’s credit box is wide and the riskiest portions have been used more and more. It spans as low as a 580 credit score, as high as a 57 DTI, and generally a 98.2 CLTV. In addition, about 1/3 of FHA borrowers make no downpayment. Therefore, the credit box for the marginal buyer is not tight, it is loose.

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Credit Score</th>
<th>DTI (in %)</th>
<th>CLTV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July-13</td>
<td>July-18</td>
<td>July-13</td>
</tr>
<tr>
<td>5</td>
<td>632</td>
<td>603</td>
<td>55</td>
</tr>
<tr>
<td>10</td>
<td>643</td>
<td>618</td>
<td>53</td>
</tr>
<tr>
<td>25</td>
<td>658</td>
<td>639</td>
<td>48</td>
</tr>
<tr>
<td>50 / median</td>
<td>683</td>
<td>665</td>
<td>42</td>
</tr>
<tr>
<td>75</td>
<td>720</td>
<td>700</td>
<td>35</td>
</tr>
<tr>
<td>90</td>
<td>760</td>
<td>738</td>
<td>29</td>
</tr>
<tr>
<td>average</td>
<td>692</td>
<td>672</td>
<td>41</td>
</tr>
</tbody>
</table>

Share that received downpayment assistance 26 32

Source: AEI Center on Housing Markets and Finance, [www.aei.org/housing](http://www.aei.org/housing), and FHA Snapshot data.
All FHA loans are increasing in risk, but alarmingly, it is the riskiest FHA loans that are getting even riskier. As house prices and leverage continue to rise, it will be largely borrowers at the lower end of the market that will continue to add on risk – and drive up house prices for everyone.

With both equity and income leverage increasing, the long running boom in home prices not only shows no signs of abating, but rather is accelerating. One sign of growing equity leverage is the fact that for home buyers guaranteed by FHA, the dollars of initial equity has stayed roughly the same, while home prices over the same period have increased by 24%.

Note: In April 2017, Ginnie Mae started including the FHA upfront mortgage insurance premium in the LTV. Due to this switch and lagged reporting of loans for March 2017, this month’s median downpayment is imputed by averaging the median downpayments for February and April 2017, which are largely unaffected by Ginnie Mae’s reporting change.

Due to FHA’s loose lending standards, historically high loan limits and market share, and an appraisal process focused on market price, not market value, FHA borrowers are setting the price for a large share of the market including conventional loan buyers.

Law of Marginal Buyer: home prices will keep rising so long as the marginal buyer, who sets price for all, has access to higher leverage. Historically, the government, has been the most willing provider of this leverage.
Borrowing at the Conforming Loan Limit, GSE Purchase Loans

Current policy is driving loan balances higher during a very tight market. FHFA first raised the conforming loan limit from $417,000 to $424,100 in Jan. 2017, then to $453,100 in Jan. 2018.* Borrowers in non-high cost areas immediately borrowed at the new maximum. The same holds for high-cost areas (not shown).

*FHA and VA also raised its maximum guaranty amount in line with FHFA and HUD. Data for February 2018 are partial. Source: AEI Center on Housing Markets and Finance, [www.AEI.org/housing](http://www.AEI.org/housing).
A huge gap has opened up in the riskiness of purchase loans originated by banks and nonbanks. Banks have reduced risk by shifting away from subprime borrowers and low downpayment loans. Nonbanks have increased share by taking advantage of broad Agency credit boxes and continued easing, thus making them the preferred risk channel. While this share shift has stabilized, risk levels continue to diverge. The entire year-over-year increase in risk is attributable to nonbanks.

Note: Composite includes credit unions and state housing agencies, which are not shown separately.