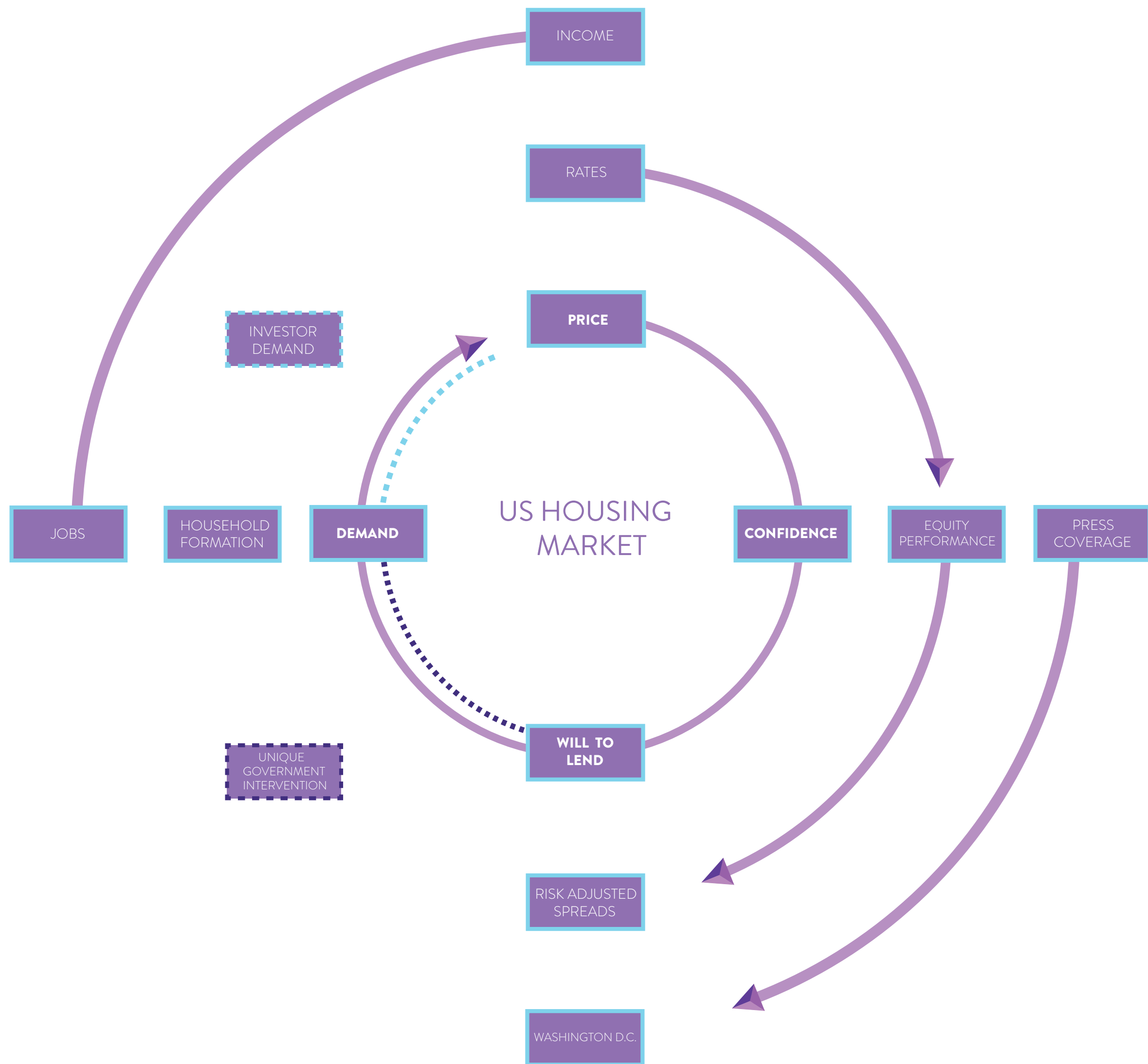
HUMBLING PROOF IN HIGH PROBABILITIES



A FINANCIAL IMBALANCE

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Dear Mr. President,

There is humbling proof in high probabilities. As an economist, statistician and housing expert, I am lamentably confident that home prices will fall by 15% within three years. Overvalued homes make up $23 trillion of consumer asset value and serve as the psychological linchpin for $17 trillion of invested capital. Home price devaluation will expose a major financial imbalance that could lower an entire generation's esteem for the American dream.

3 Stages of the home price decline

Unless the calculus of history is a poor guide, there is a 60% chance that home values decline materially, in fact, the correction is already underway. This probability rises when new negative shocks emerge. The home price decline will be defined by 3 stages:

Stage I: Hot to Cool: Active since summer 2013;* price growth slides across the country as flippers lose money outright in the red-hot investor markets (NYC, San Francisco and Las Vegas); new home absorption rates - sales per community - decline; investors slow their home purchases; total home sales decline year over year; developers lose pricing power; press outlets shift from positive to mixed about the health of the housing market.

Stage II: Demand to Supply: Small shocks convert demand pools into supply ripples. A first wave of investors begin trimming prices to get ahead of future declines; discounts increase to incentivize purchasers as purchasers increase their delays for better deals; developers reduce land budgets as cancellations tick up; major financial press outlets take a more negative tone toward housing lowering confidence overall.

Stage III: Deflation & Response: Falling home prices create a negative deflationary feedback loop that foreshadows a once-in-a-lifetime policy response. Deflationary economics take full hold; leveraged bets on real estate unwind in quarterly ripples due to the public reporting cycle & asset manager redemption schedules; willingness to lend shrinks; the broader consumer finally understands it is a bad time to buy a home; a shrinking housing market negatively impacts jobs causing recession; the estimated effects of never-before-seen public policy reactions determine when and where prices eventually trough.

Rates & Shocks

We are 16 months into **Stage I**. A sooner-than-expected rise in mortgage rates - or other adverse shocks - will domino the decline into **Stage II** unintentionally. Because financial markets rely heavily on Federal Open Market Committee (FOMC) communication and the Fed funds rate is near zero, "forward guidance" shifts have as much impact as yesteryear's rate increases. To that end, two recent policy communications raise immense concern that **Stage II** of the home price decline could be incited soon: the first public speech of Loretta Mester and a recent letter from the ranks of the Federal Reserve Bank of San Francisco.

September 5, 2014: Loretta Mester, President and CEO of the Federal Reserve Bank of Cleveland, in her first public address since becoming an FOMC voting member **welcomed and expects increased volatility** following future Fed guidance and rate changes. Mrs. Mester, the FOMC's newest communication sub-committee appointee, described volatility as a "necessary part of price discovery." Her personal view is that forward guidance should be tied to actual progress, anticipated progress and the speed at which progress is being achieved (volatility). Progress toward full employment and 2% inflation has occurred faster than she and the Fed expected. While stock market volatility has hovered near all-time lows during the Fed's most recent communication expansion, home price volatility is at extremely elevated levels.

September 8, 2014: A letter from Jens Christensen, a senior economist at the Federal Reserve Bank of San Francisco, highlighted a concerning expectation gap between investors and the Federal Reserve regarding future interest rates. In the letter titled *Assessing Expectations of Monetary Policy*, the author showed that public **investors are expecting a more rate-accommodative policy than the Federal Reserve** and these investors are more confident than the Fed in this stance.

* Stage I started when mortgage rates spiked more than 1% from May to September following a Federal Open Market Committee

As public policy makers debate seminal decisions on "forward guidance" and unconventional monetary stimulus we note that each 1% increase in mortgage rates drops home values by 4%. At a 2% Fed Funds rate, where Fed officials and investors expect to be by the end of 2016, today's overvaluation of 12% grows to 20%. Respectfully, the United States cannot afford another housing driven recession.

With home price volatility at an all time high, the escalation from **Stage II** to **Stage III** is difficult to predict today. At **Stage III**, the virtuous cycle of housing, a unique mix of causal financial and social relationships, breaks. At these points in history unique governmental intervention provided the only spark that reignites demand. Price discovery is volatile around each new catalyst of information, and the trough will emerge as consumer and investor confidence rebuilds at lower prices. I believe confidence rebuilds at 15% lower valuations without preemptive positive shocks.

Solutions
After a major decline in housing prices nearly a century ago Franklin Delano Roosevelt asked himself a fearless question: "What can I do for my country?" Anticipating another decline, I asked this same question. First, I wrote this letter to properly highlight the risks and the high probabilities that point to housing weakness ahead. Below, I have outlined three humble suggestions and two actions I will take to support the country's largest assets, the homes where we sleep.

Public policy suggestions:
Formulate and preemptively communicate a **forward-looking monetary policy** that balances the risk of raising interest rates from a very low base six years into an economic cycle. If the impact of "forward guidance" changes cause housing weakness and a reduction in corporate profits how will monetary policy spur a weakening economy? Does language simply reverse? Because we are near the end of monetary easing with rates near 0%, will new monetary stimulus be more likely? Could rates be lifted while the stimulus is being increased? Are shadow rates worth considering? An early address of the new cyclical policy toolkit will ease investor volatility when economic slowdowns eventually occur.

Create a **skilled trade externship program** for the laborers who lose jobs because of lower housing investments. This will lower the multiplier effect of a housing downturn by directly supporting the things that the laborers drive in booms and crash in busts. Simultaneously use this program to train younger Americans in specialized trades while boosting the infrastructure in the country.

Forcefully rebalance the number of homes to the number of households. Reduce new builds: have federal and state regulators reclaim building permit powers from municipalities and localities and limit building to some reasonable percentage of expected household growth. Demolition: shrink the number homes that can force prices down, particularly those that are already vacant, unsafe and expensive to rehabilitate. Increase migration to the country with a preference toward household headship.

Actions I will take:
I will make it **easier for small businesses to form and grow**. Omicelo, a company I am founding, is an innovative network of business specialists who make entrepreneurs' dreams come true. We support and build healthy organizations for small business owners using the most advanced virtual technology. Because these small businesses are the country's largest job creators (two out of every three), I believe Omicelo, at its best, has a chance to thwart some of housing's negative cyclical impact.

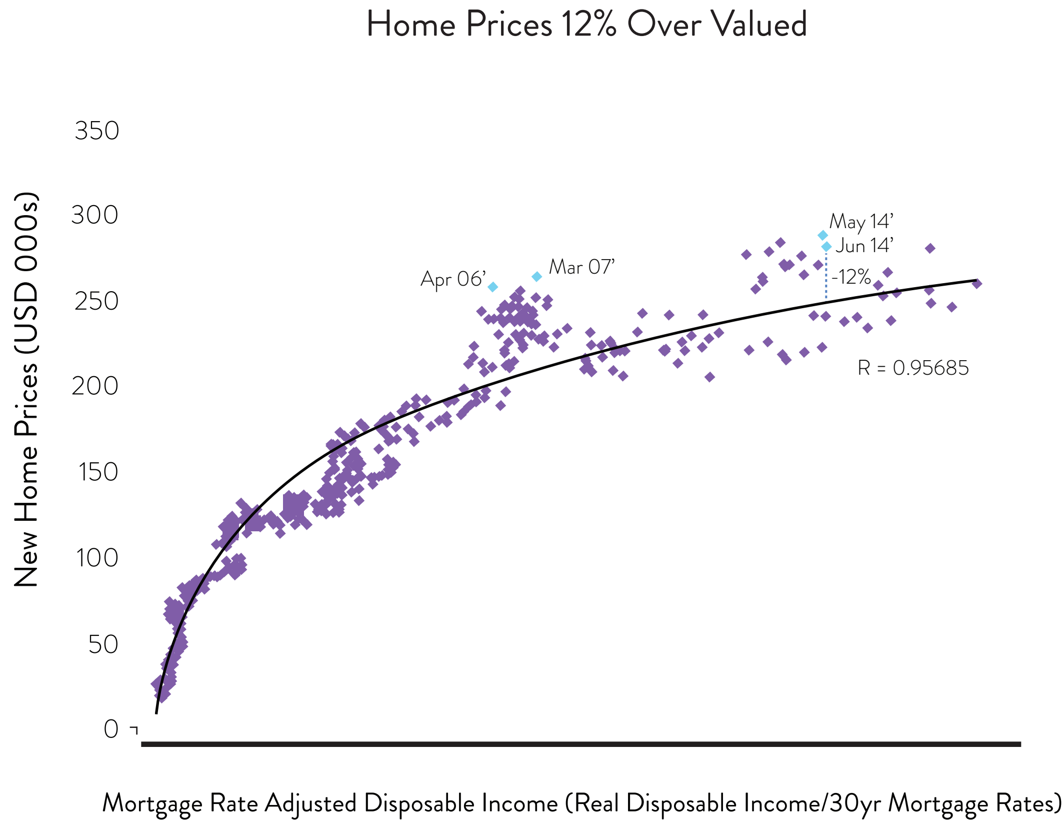
If the housing market slips too quickly into **Stage II**, as described above, I will **create a hedge fund** guided by the attached analysis and its future iterations. Eighty percent of the performance fees will be given to high-performing teachers, firefighters and underemployed construction workers. This group of Americans is disproportionately hit during economic crises and have yet to recover from the Great Recession. I will use the accumulated capital over time to build a stronger foundation for the housing market.

I have dedicated over 40,000 hours to the US housing market in the last ten years. I have been trained at the finest institutions in the country. This is the most important work I have done to date. I give it to you at no cost recognizing that the prices of action and inaction are steep. I believe that together we can find and execute a proactive solution that supports the value of the places we all call home.

Respectfully yours,
Joshua Pollard

Summary

House prices are 12% overvalued today. They have already started to decline. Today's misvaluation matches the excess of 2006-07, just before the Great Recession. Since World War II home prices have been tightly correlated to income and mortgage rates (R2 = 96%). Investors/cash purchasers, which make up 50% of home sales[1], have driven real estate volatility to unrivaled levels in trackable history. As public policy makers debate seminal decisions on "forward guidance" and unconventional monetary stimulus we note that each 1% increase in rates drops home valuations by another 4%. At a 2% Fed Funds rate, where Fed officials and investors expect to be by the end of 2016, the overvaluation equals 20%. Respectfully, the United States can not afford another housing driven recession. The facts and correlations - the tenets of probabilities - suggest it is more likely than not that home prices fall 15% in the next three years.



[1] In December 2011 the National Association of Realtors "re-benchmarked" the existing home sales data series. Flipped homes were removed from 2007-11 data and are not included in 2012-14. Total home sales are 10-20% higher than conventionally measured, driven by investors/cash purchasers. The homes they purchase and sell do not hit the inventory data series.

Source: BEA, Bankrate.com, Census

The home price decline will occur in three distinct stages: **I. Hot to Cool**, **II. Demand to Supply** and **III. Deflation & Response.**

Stage I has been underway for 16 months, ignited by a Summer 2013 interest rate spike[2] while prices were rising by double digit percentages. Another rate shock, driven by unexpectedly hawkish Fed language, would likely stoke the decline from **Stage I** to **Stage II**.

Homes Prices 20% Over Valued at
2% Fed Funds rate

		m	x (ln)	b	y	Price Equilibrium % Chg
Fed Funds =	0.09%	63.73	8.0	-266	247	-12.0%
Fed Funds =	0.25%	63.73	8.0	-266	246	-12.1%
Fed Funds =	0.50%	63.73	8.0	-266	242	-13.5%
Fed Funds =	1.00%	63.73	7.9	-266	236	-15.9%
Fed Funds =	2.00%	63.73	7.7	-266	224	-20.0%

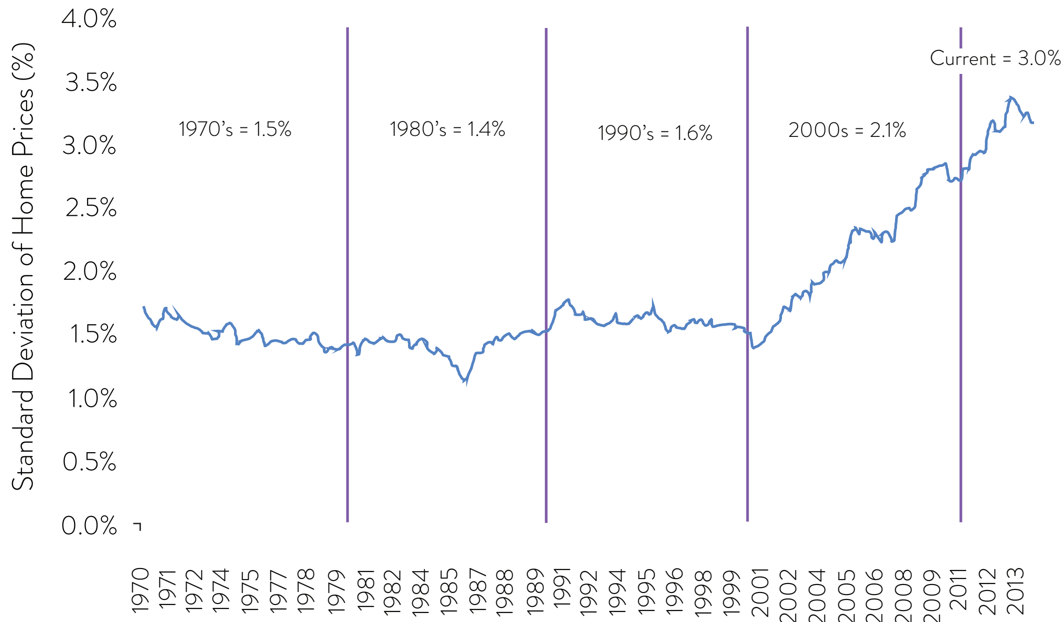
Average mortgage spreads assumed

[2] On May 1, 2013, the Federal Open Market Committee changed its "forward guidance" from "will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate" to "prepared to increase or reduce the pace of its purchases to maintain appropriate policy accomodation as the outlook for the labor market or inflation changes." May 1st was day 1 of a 92 day spike in the 10 year yield from 1.63% to 2.99%.

Source: BEA, Bankrate.com, Census, Original Calculations

In **Stage II** investors stop buying and immediately start selling. This activity increases inventory and home prices fall year-over-year. Recent buyers are remorseful. Negotiating buyers begin waiting to see if better prices are ahead until prices slide and cause **Stage III** to begin.

The **velocity of Stage II** is extremely difficult to predict. Home prices (if you think about them like living things) mock what they see. "If Billy across the street goes up $50,000 then Bobby down the block wants to go up $50,000." In statistics-speak home prices are autocorrelated in the short term partially because the US appraisal system forces Billy and Bobby to stay close. The transition from **Stage II** to **Stage III is set up to happen quicker than ever** because Billy and Bobby (individual home prices) go up and down two times faster than normal.

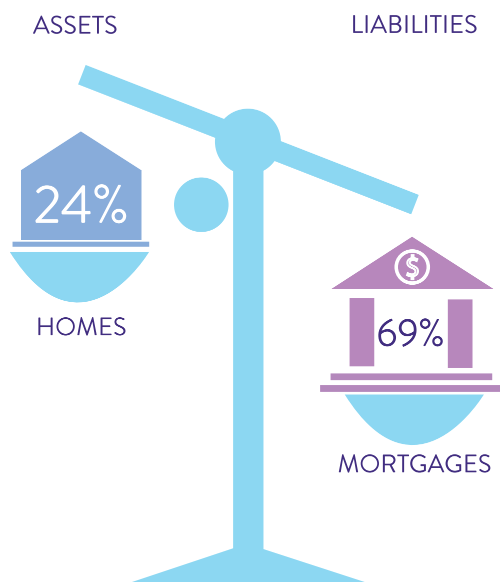


Source: NAR

A material financial imbalance is aggravated when home prices decline. Homes make up 24%, or $23 trillion, of consumers' total assets. An uneven 69% of consumers' liabilities are the mortgages tied to those same homes. This tilted financial position means a 5% reduction in home prices equates to a 8.6% decline in consumer net worth. At 15% home price deflation consumers' real estate net worth drops 26% or $3.4 trillion.

$3.4 trillion of wealth destruction impacts homeowners financially and future buyers psychologically. Unfortunately the Millenials early-adulthood real estate appetite was handicapped by the Great Recession. With a 45% underemployment rate for recent college graduates,[3] elevated student debt and increased home price volatility the willingness/ability to own will likely shrink among the country's next major wave of consumership.

A Financial Imbalance



U.S. Consumers & Non-Profits

USD billions

			% of Total Assets
Assets			
	Real Estate	22,820	24%
	All Other assets	72,728	76%
	Total Assets	95,549	100%
Liabilities			
	Mortgages	9,551	69%
	All Other Liabilities	4,234	31%
	Total Liabilities	13,785	100%
Equity/Net Worth			
	Real Estate	13,270	16%
	All Other Equity/Net Worth	68,494	84%
	Total Equity/Net Worth	81,764	100%

[3] Are Recent College Graduates Finding Good Jobs? Jaison R. Abel, Federal Reserve Bank of New York, Current Issues in Economics and Finance Volume 20, Number 1 http://www.newyorkfed.org/research/current_issues/ci20-1.pdf

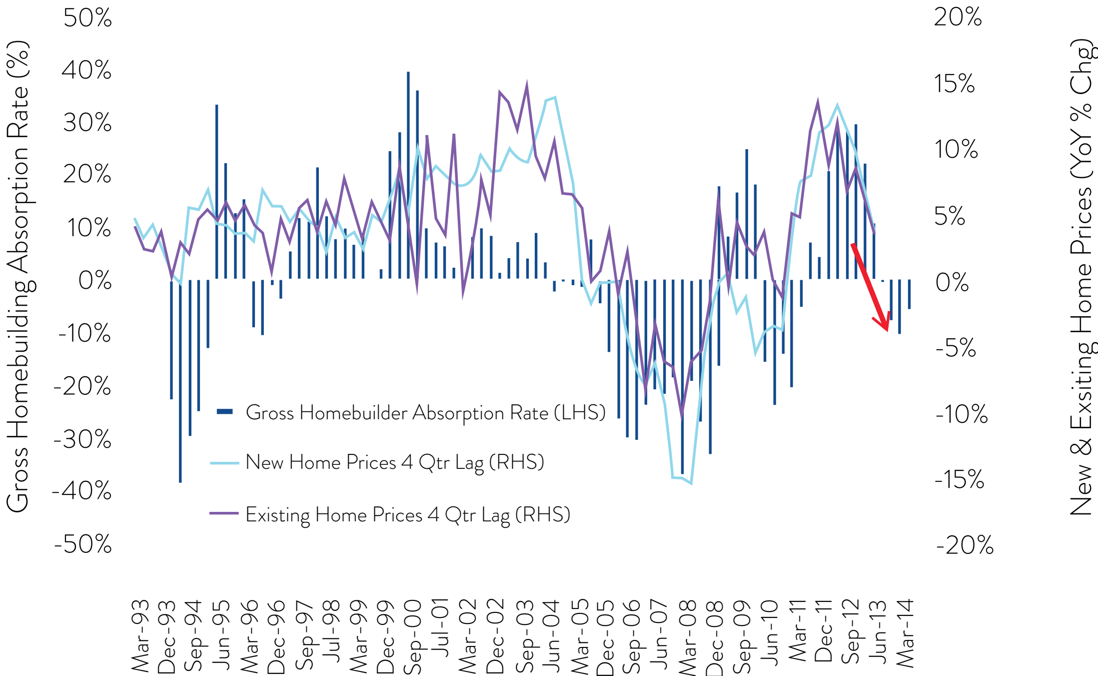
Source: Federal Reserve

3 Stages of the Decline

STAGE I: Hot to Cool

1A. Homebuilder absorption rates precede a home price decline

Homebuilder absorption rates have been a unique leading predictor of new and existing home prices. Changes in gross absorption rates - the number of homes sold per community for the largest homebuilders - have historically led home prices by four quarters. Gross absorption rates have been declining for four quarters in a row.



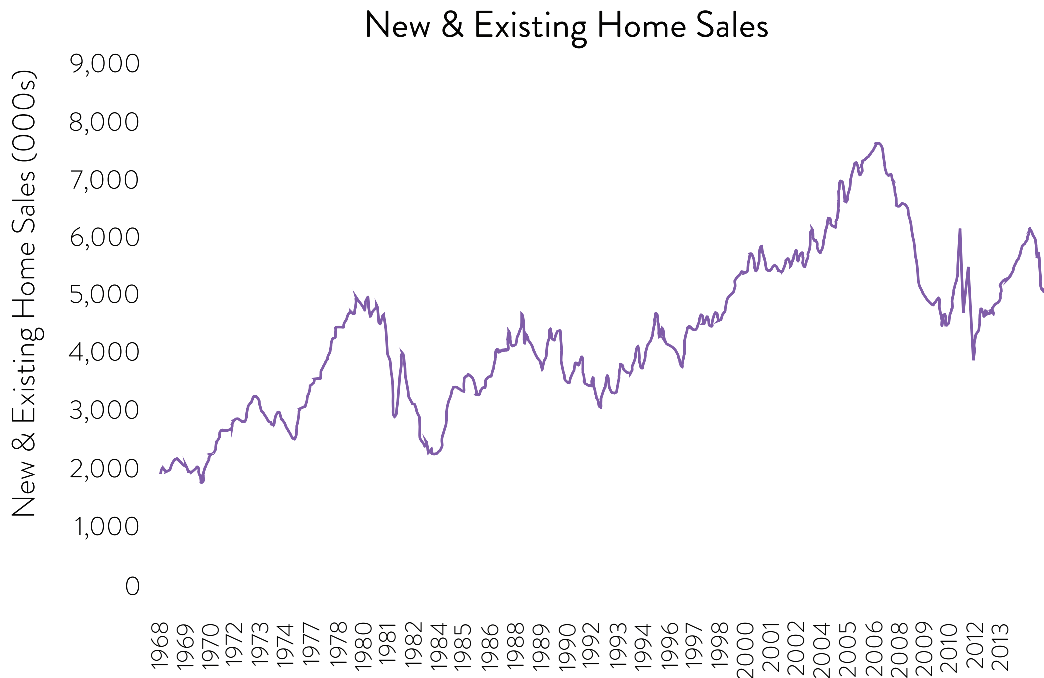
Source: Company filings, NAR, Census

1B. Total home sales decline overall

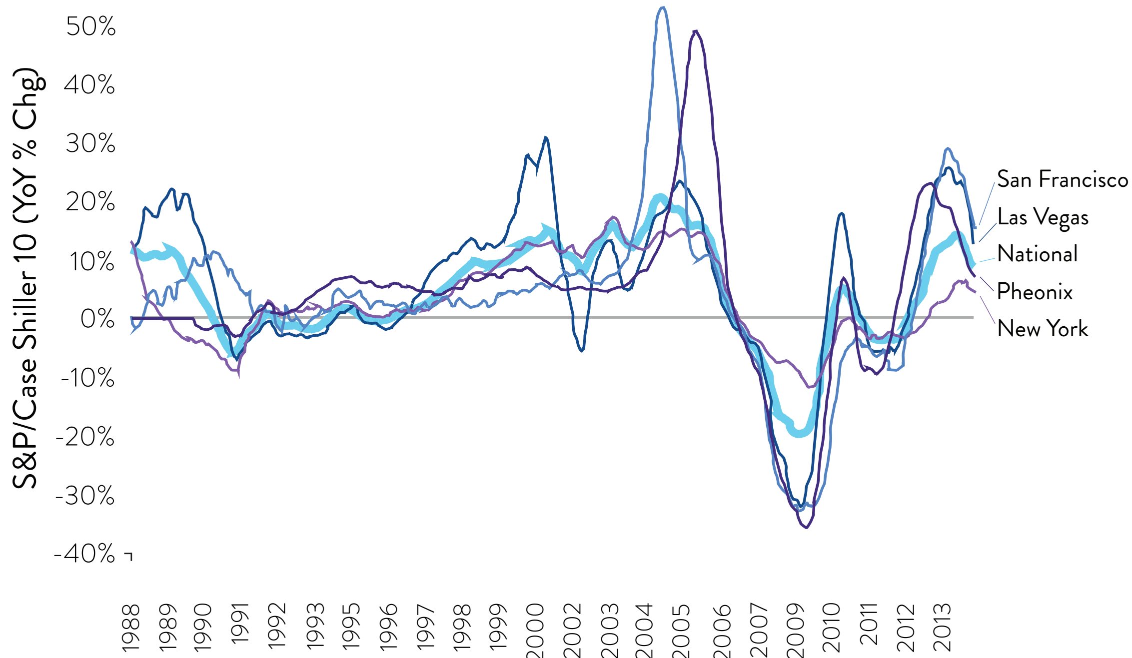
Total home sales are down 4% year over year.

1C. Home price growth slows with outright drops in some places

As of June 2014 prices are already falling outright in 7 of the 10 largest markets. In standardly quoted stats home prices are up 8% over last year, but with the most recent sequential price drops, prices will be down 1% yoy if prices simply stay the same until next year. Downward pressure is more likely to continue than not given the 12% overvaluation and home price autocorrelation.



Source: NAR, Census



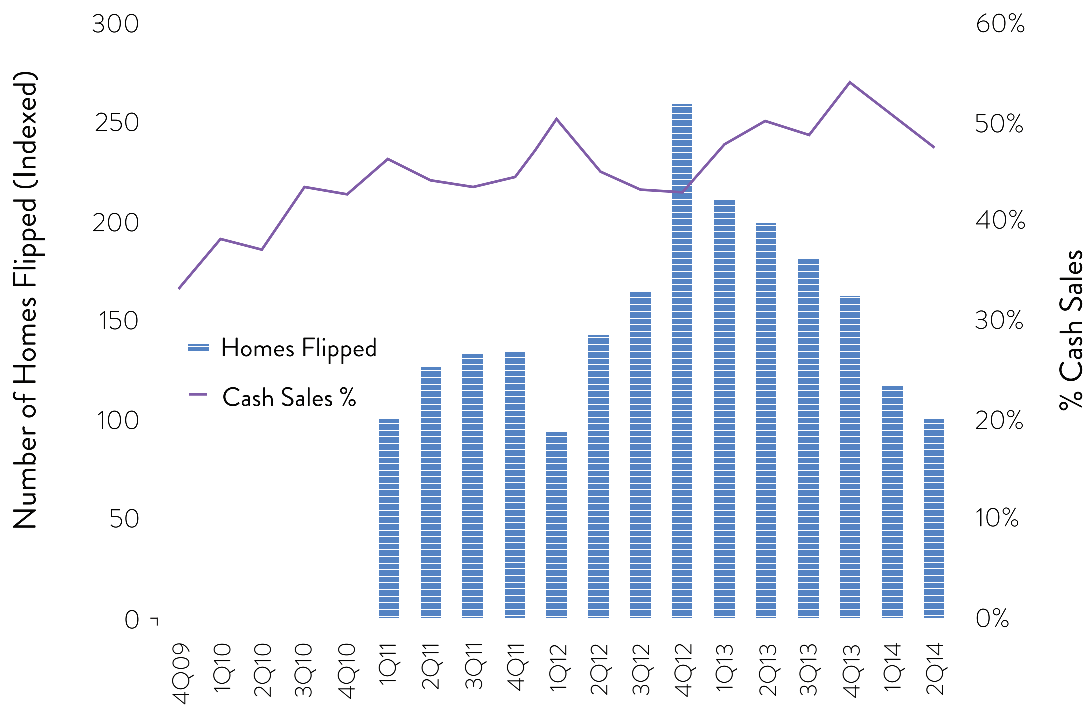
Flat to down June prices from peak highlight slowed investor activity

City	Jan - 14	Feb - 14	Mar - 14	Apr - 14	May - 14	Jun - 14	% chg from peak
Chicago, IL	126.33	127.61	130.53	131.15	130.26	128.41	-2.1%
Washington, D.C.	207.30	208.59	211.71	210.20	209.18	208.27	-1.6%
Boston, MA	170.45	171.13	173.16	176.52	175.58	173.83	-1.5%
San Francisco, CA	186.62	189.88	193.21	192.95	192.16	191.45	-0.9%
San Diego, CA	198.30	200.56	202.83	202.06	201.80	201.63	-0.6%
New York, NY	174.02	174.41	174.76	174.66	174.37	174.28	-0.3%
Los Angeles, CA	216.77	219.61	222.04	221.90	221.64	221.47	-0.3%
Denver, CO	148.78	150.32	151.37	152.13	152.22	152.33	-0.1%
Miami, FL	179.78	180.65	183.68	185.16	185.69	185.90	-0.1%
Las Vegas, NV	129.93	129.85	131.25	131.88	133.30	135.12	1.4%

Source: S&P Case Shiller 10

1D. Investor demand slows

The number of homes flipped in the U.S. has declined 50% in the last four quarters alongside slowing home price growth. In fact for the first time since the Great Recession home flippers lost money, before taking re-hab costs into account, in some of the largest real estate markets in the country, namely Las Vegas, New York and San Francisco. Generally, investor demand is only a complement to larger trends in home-buying; however, with all-cash sales being roughly half of total closed sales their impact has been magnified.



Source: Realtytrac, Original Calculations

Negative homebuilder absorption rates, in conjunction with slowing average selling prices are the clearest signs of a weakening housing environment in **Stage I**. Economists and management teams acknowledge these early weaknesses but remain positive until a "trend" emerges because the data is volatile. When the "trend" properly surfaces we are already in **Stage II**.

Distribution of Homebuilders' Spring Orders

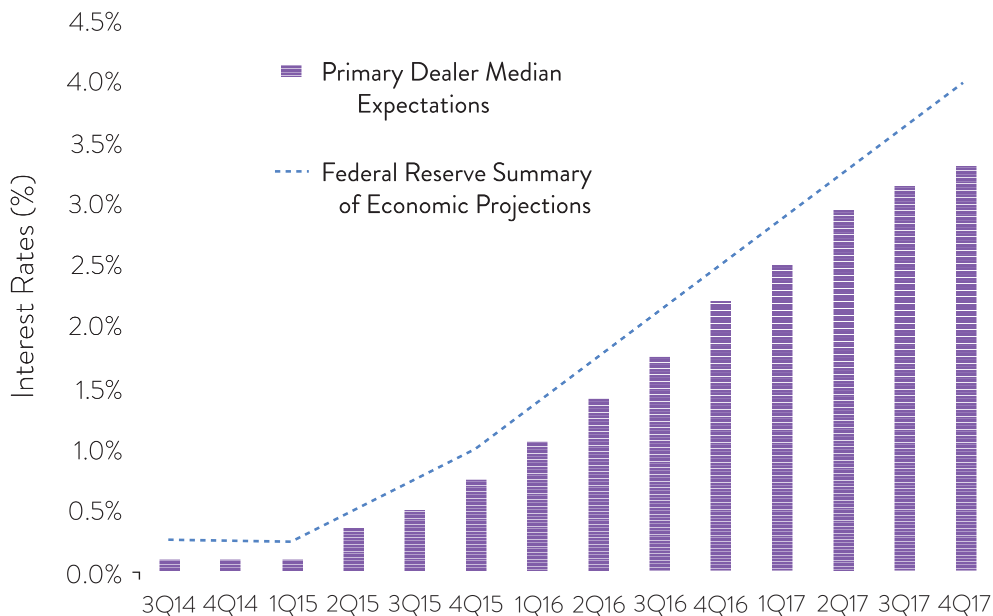
YoY (%) Growth	2012	2013	2014
15% +	1	10	0
10%-15%	2	3	4
5%-10%	5	0	6
2%-5%	4	0	2
0%-2%	1	0	1

Source: Company filings

STAGE II: Demand to Supply

An investor driven housing recovery inherently introduces volume and price volatility. As housing conditions deteriorate an extrapolation of home price movements transition investor mentality from one of voracious demand to cautionary holding and then excessive selling to beat future price declines.

Because home price values drop 4% for every interest rate point increase, there are not many shocks as powerful as unexpected interest rate lifts. In a concerning letter from economists at the Federal Reserve Bank of San Francisco, Jen Christensen shows that investors are more optimistic than the Federal Reserve Board of Governors about the path of interest rates.[4] Over the last 25 years home sales have never increased when mortgage rates rise by more than 50 basis points in a month. In 2 out of every 3 such cases, volumes declined by 3-4% that same month. Interest rate shocks this deep into **Stage I** have the highest probability of forcing **Stage II**.



[4] Assessing Expectations of Monetary Policy , Christensen and Kwan, September 2014

Source: Federal Reserve Bank of San Francisco

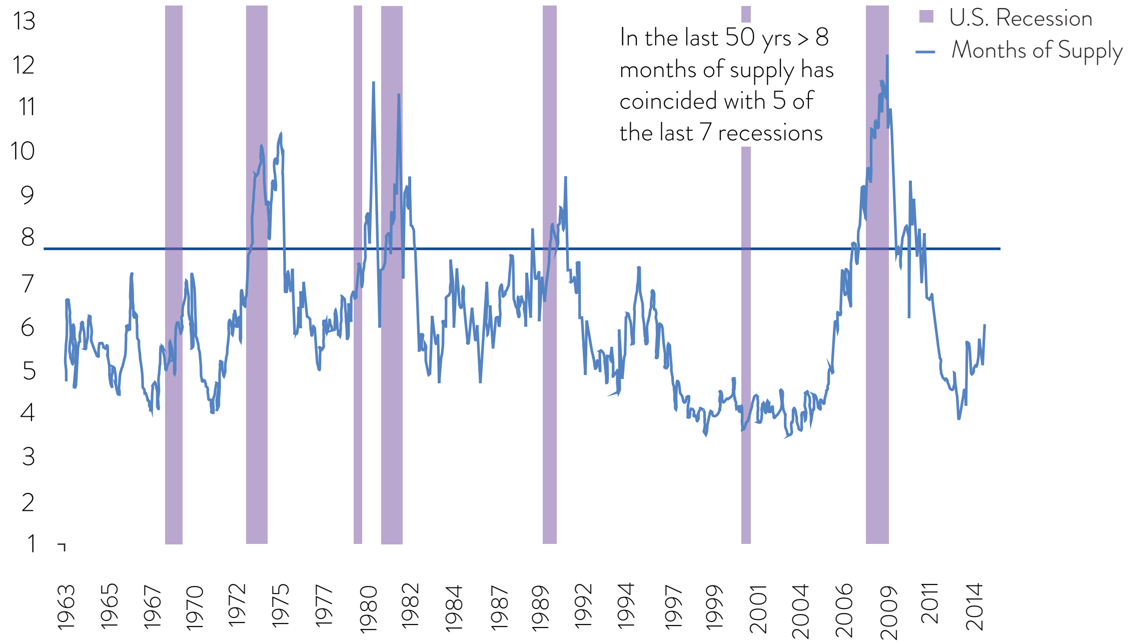
Small shocks have outsized impact with high investor demand and high valuations. Investors are naturally unemotional about assets, focused squarely on cash returns. An investor buyer of 100 homes (demand) can quickly become a seller of 100 homes (supply) without having to solve for speed-limiting consumer issues like finding another place to live, switching school districts or missing neighbors.

If investors reduce their demand by 50% and put half of last year's purchases on the market, which is not unreasonable when home prices fall, total months of supply jump to 7.5 months from a healthy 5-6 months today. Similarly if 15% of aggregate demand converts to supply a comparable increase in the months supply can occur. Five of the last seven US recessions were led by a weakening housing market, with greater than 8 months of supply.

	Chg in 30yr Fixed Rate	NHS + EHS % mom Chg
Aug 1990	51 bps	-4%
Jan 1992	58 bps	-7%
Mar 1994	61 bps	-3%
Feb 1996	52 bps	0%
Jun 1998	132 bps	0%
Jul 2003	86 bps	-4%
Apr 2004	58 bps	0%
May 2004	67 bps	-3%
Median	60 bps	-3%

Source: BEA, Bankrate.com, NAR, Census

Months Supply of Homes In US



Total Months Supply

% of Last Year's Investor Demand that Becomes Supply

% Investor Demand Slowdown	10%	25%	50%	75%	90%
10%	5.9	6.3	6.9	7.5	7.9
25%	6.1	6.5	7.1	7.8	8.2
50%	6.5	6.9	7.5	8.2	8.6
75%	6.8	7.3	8.0	8.7	9.1
90%	7.1	7.5	8.3	9.0	9.5

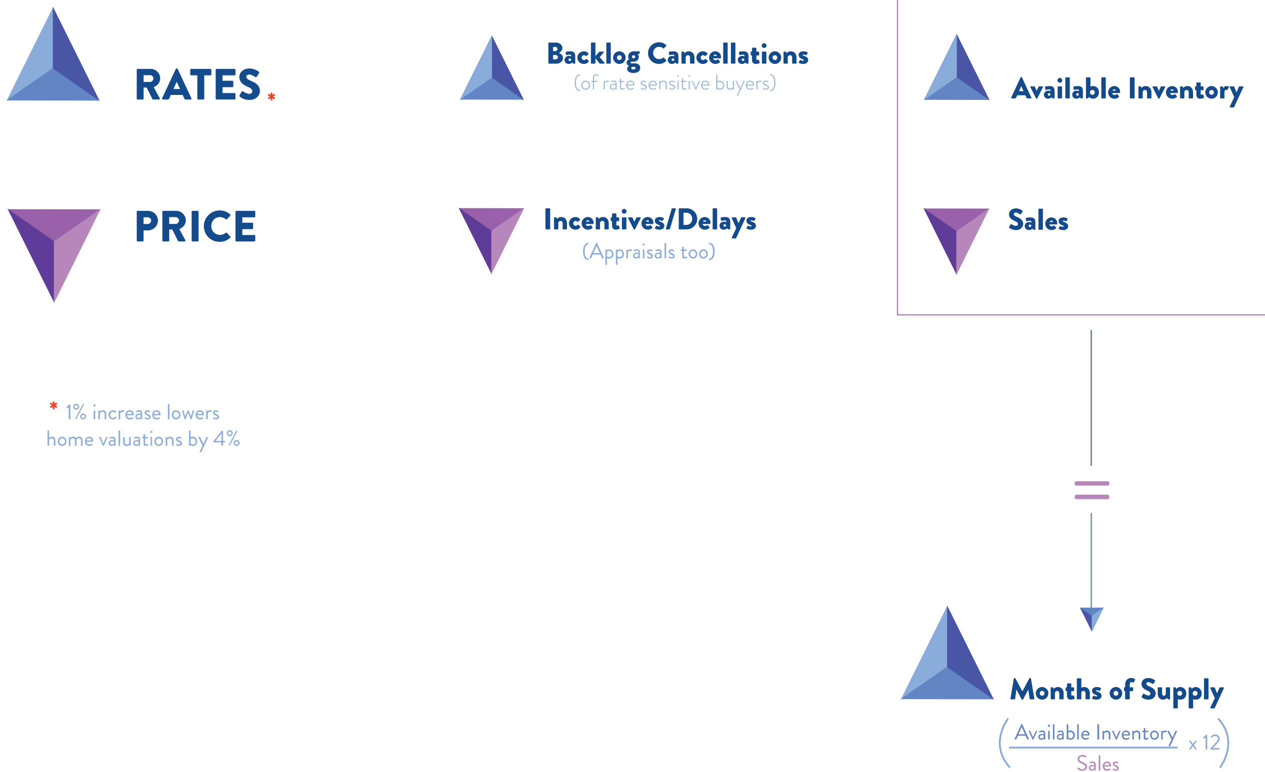
Total Months Supply

% of Last Year's Non-Investor Demand that Becomes Supply

% Non-Investor Demand Slowdown	0%	5%	15%	25%	35%
0%	5.6	6.2	6.8	7.4	7.8
5%	5.7	6.3	7.5	8.8	10.0
15%	6.0	6.6	7.9	9.2	10.5
25%	6.3	7.0	8.3	9.7	11.00
35%	6.6	7.4	8.8	10.2	11.7

Source: NAR, Census, Original Estimates

Rate Impact on Months Supply



The largest homebuilder in the U.S. discussing incentives:

July 2006
"Incentives are driving some buyers to cancel...if you have one builder offering this discount today and another builder offering a slightly higher discount tomorrow, sometimes I think we force some of the buyers to be sitting on the sidelines saying, 'oh, I don't have to buy today, so maybe I'll just cancel and wait.'"

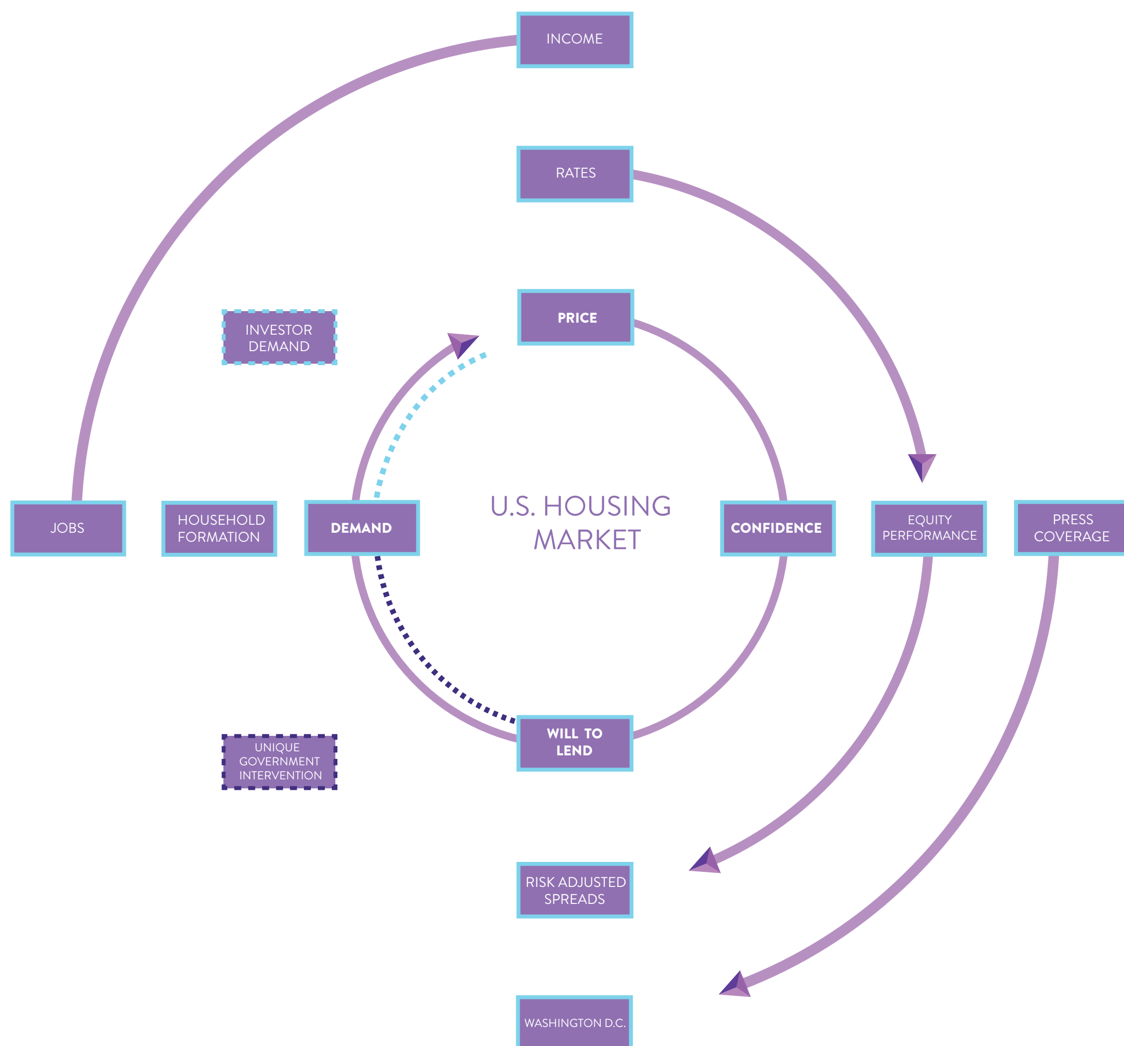
July 2014
"As the spring unfolded, we adjusted and increased the level of incentives in many communities."

Source: Original Infograph, Company transcripts

STAGE III: Deflation & Response

The drivers of housing are structurally recursive. The shift from a good market to a bad market occurs quickly, exaggerated by the circular currents of confidence from consumers, investors and lenders in unison. When unnatural levels of demand or supply impact the market, prices are pushed in lockstep.

Unnatural demand from investors has created a mismatch relative to long term drivers - income and rates. Arguably, the upward price movement driven by investor demand has helped to restore the confidence of consumers and lenders in housing as an asset class, however, this shifts quickly. Home prices are already declining and the probability of a more severe decline becomes too high to ignore if new negative shocks force **Stage II** and **Stage III** of home price declines.



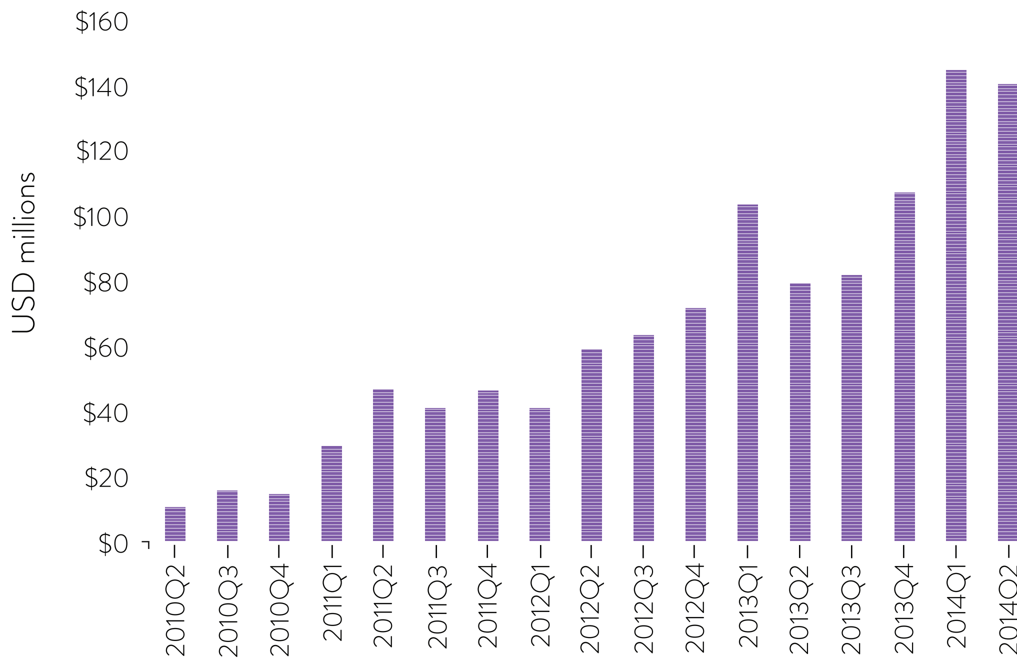
Source: Original Infograph

Appendix

Housing securities are up 8% in aggregate over the last year. Additionally, there has been a substantial increase of venture capital into real estate technology ventures.

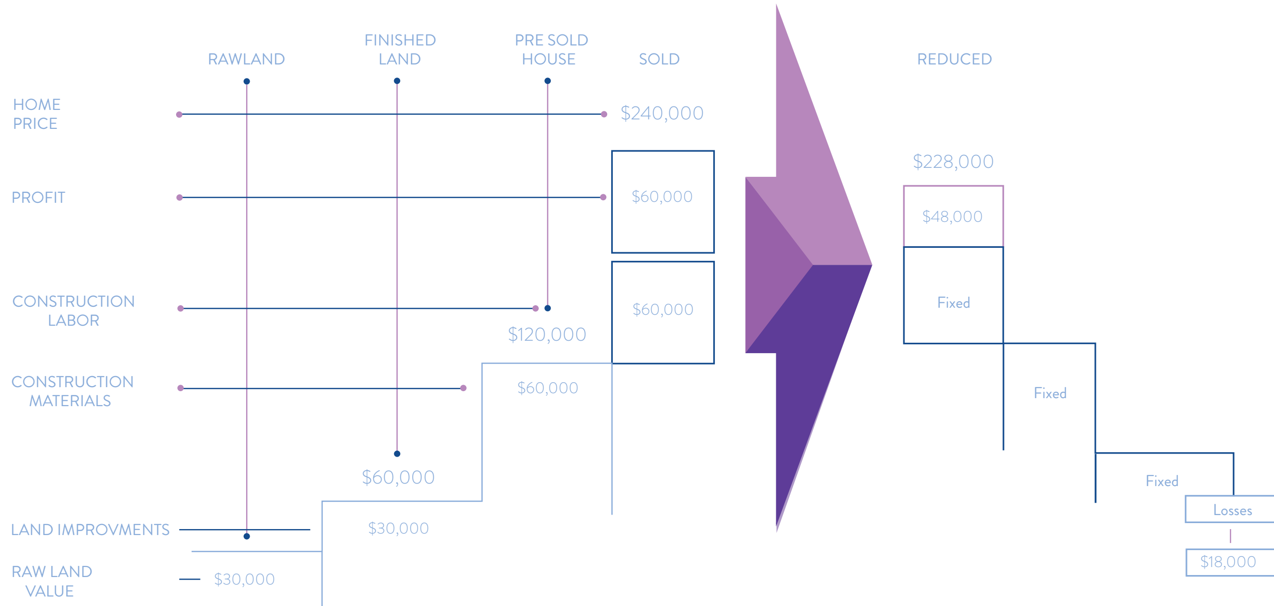
	Value			Price						Operations		Valuation					
Sector/Ticker	Market Cap	Total Debt	Invested Capital	Today	1D	5D	1M	3M	12M	Rev	EPS	P/E (0)	P/E (4)	EV/EB	DivYld	P/TBV	ROE
Home Improvement Retailers	172,744	25,245	197,989		0%	-1%	7%	16%	16%	6%	26%	21.6	18.3	10.1	1.69	15.4	31.6
Housing REITs	102,811	47,333	150,144		-1%	-5%	-3%	-1%	10%	231%	-38%	77.7	58.4	18.9	4.40	5.5	4.4
Mortgage REITs	70,142	301,018	371,160		-1%	-3%	-2%	-4%	7%	16%	-11%	15.2	10.3		11.10	2.2	14.6
Building Products	67,339	15,940	83,278		-1%	-2%	6%	5%	4%	18%	51%	42.7	18.8	9.6	0.68	19.3	0.7
Mortgage Finance	52,550	5,206,389	5,258,938		-1%	-2%	-2%	-6%	22%	42%	57%	16.9	9.0		1.61	11.7	1.6
Homebuilders	53,101	28,079	81,179		0%	-1%	1%	-3%	3%	49%	362%	16.7	14.7	9.0	0.25	10.4	0.2
Housing Total	518,686	5,624,003	6,142,689		-1%	-3%	0%	-2%	8%	69%	78%	31.1	20.1	14.0	5.14	7.6	7.0

VC Real Estate Tech Spending



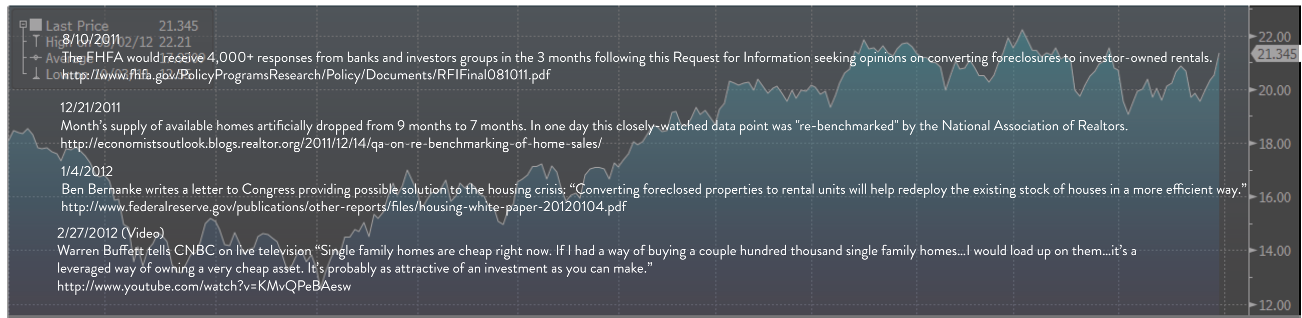
Source: Bloomberg, CB Insights

LAND PRICE SENSITIVITY



5% home price reduction
=
40% raw land value cut

The 4 events that changed the housing market



Source: Original Infograph

Joshua Pollard
CEO x Co-Founder of Omicelo

Joshua's robust & accelerated business performance has earned him honors as one of the top businessmen in the world. He is the CEO x Co-Founder of Omicelo, a consultancy for small and future businesses that shrinks the time between dream and reality of innovative job creators.

At 20 years old Joshua joined Goldman Sachs as the critical member of an one-of-a-kind universal research team where he mastered the economics of ten globally-important sectors: Housing, Transportation, Business Services, Autos, Environmental Services, Engineering & Construction, Coal, Imaging, Electronic Manufacturing and Alternative Energy. At 24 Joshua became the youngest person in Goldman Sachs' history to lead an entire global investment research team. At 26 he was promoted to Vice President for his acumen as Goldman's on-the-ground US housing expert and was subsequently named one of the world's 30 best financiers under 30 by Forbes Magazine. During this time, he led a $1 billion IPO and earned first-prize in Goldman Sachs' Stockpicking College, a week long investing competition for the company's highest performers.

Before founding Omicelo, Joshua executed his psychology-based investment philosophy to drive nearly $100 million of residential and commercial real estate investments for Pine River Capital Management. In 10 months at Pine River, the Institutional Investor 2013 Relative Value Hedge Fund Manager of the Year, Joshua generated dozens of millions of capital profits at a Sharpe ratio of 3. He has also hosted over 2,000 meetings with over 350 global C-level executives.

Joshua earned his Bachelor of Arts from the University of Rochester with dual majors in Economics & Statistics and a special Finance citation from the University's Simon Graduate School of Business. Joshua was selected to be a member of the Alumni Board of Trustees at graduation.

Joshua is happily married with two sons.