

A photograph of a modern, two-story house at dusk. The house has a dark, flat roof and large windows that are illuminated from within. A large tree is on the left, and a bamboo fence is in the foreground. A blue and green graphic overlay covers the middle of the image.

THE ZILLOW EXPERIENCE: BUILDING A COMPANY ON ADMINISTRATIVE DATA

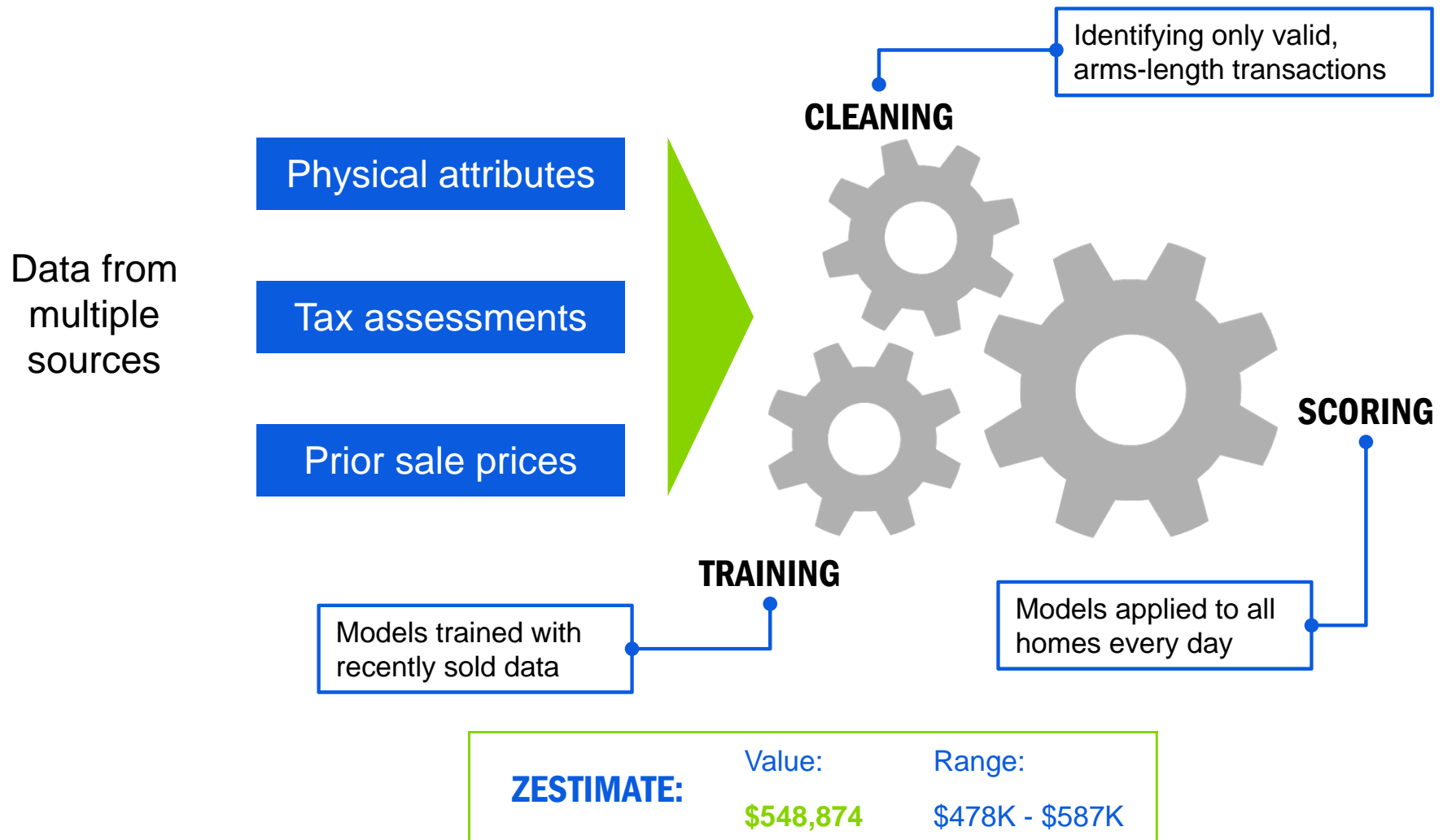
Krishna Rao, Director of Economic Product & Research
@_KrishnaRao

ZILLOW DATA

Zillow is built on a backbone of administrative data

- Start with administrative county records
 - Sales
 - Tax assessments
 - Etc.
- Combine with other sources of data
 - Multiple Listing Services and real estate brokerages
 - Census and other government data
 - User submitted data
- Results in the 'Living Database of all Homes'
 - The core of the company

Produce insight from data



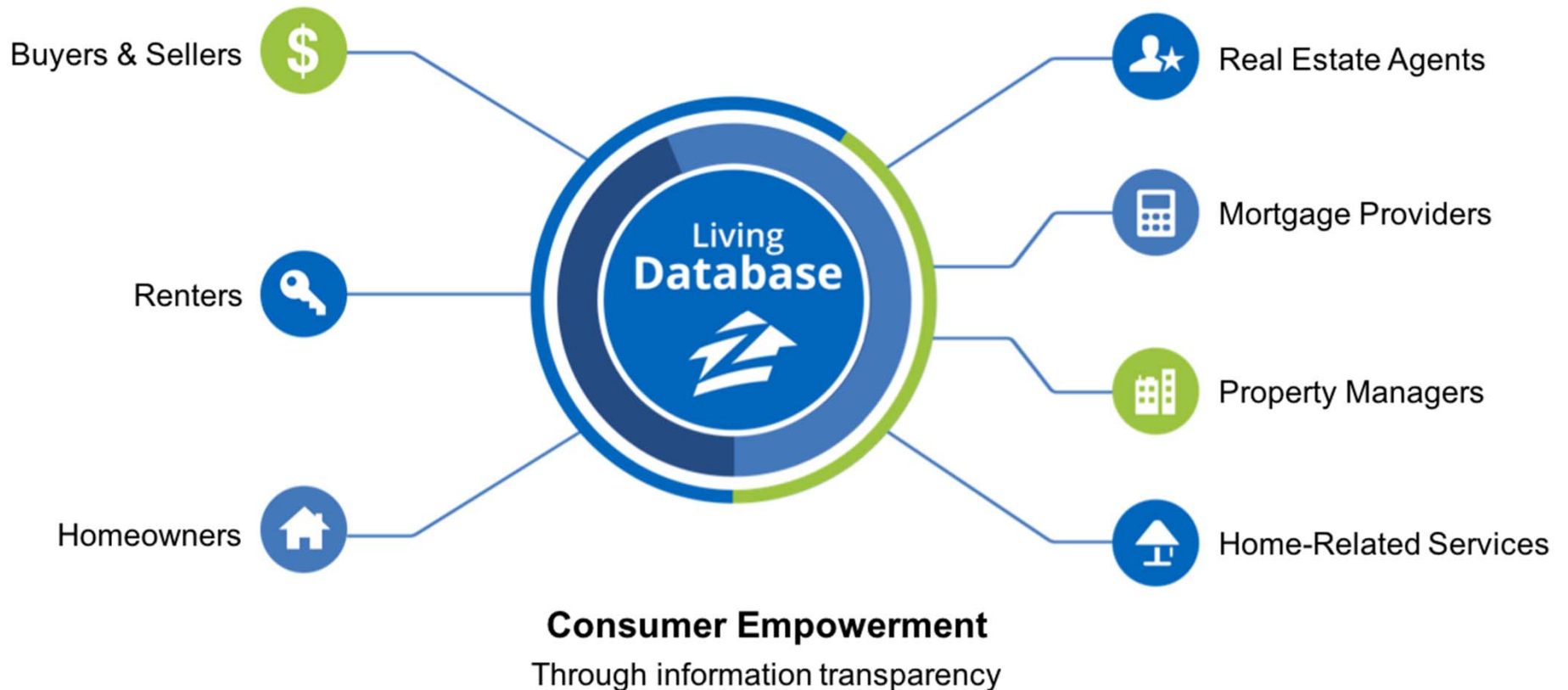
A philosophy on data

- Built on open data
 - Census data we use regularly:
 - American Communities Survey/Current Population Survey/etc.
 - Housing Vacancy Survey/American Housing Survey/Survey of Construction/etc.
- Zillow is committed to freeing data whenever and wherever possible
 - Data wants to be free
- Paying open data forward:
 - Aggregated housing market statistics openly available
 - Housing micro (parcel) data for academic research and institutional partnerships

Keep the lights on by connecting consumers to professionals

Living Database of 110M Homes

57M Home Profiles Updated by Community



Aggregated real estate data is freely available at www.zillow.com/data

Zillow Data

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About Zillow Data

- All data accessed and downloaded from this page is free for public use by consumers, media, analysts, academics etc., consistent with our published [Terms of Use](#). Proper and clear attribution of all data to Zillow is required.
- For other data requests or inquiries for Zillow Real Estate Research, contact us [here](#).
- All files are time series unless noted otherwise.
- To download all Zillow metrics for specific levels of geography, click [here](#).
- To download a crosswalk between Zillow regions and federally defined regions for counties and metro areas, click [here](#).
- Unless otherwise noted, all series cover single-family residences, condominiums and co-op homes only.

Median Home Value – Zillow Home Value Index (ZHVI)

[ZHVI Methodology](#)

[Zillow Home Value Forecast Methodology](#)

[Zillow Market Overviews](#)

TYPE	STATE	METRO/US	COUNTY	CITY	ZIP CODE	NEIGHBORHOOD
ZHVI Summary (Current Month)	Data	Data	Data	Data	Data	Data
ZHVI All Homes (SFR, Condo/Co-op) Time Series (\$)	Data	Data	Data	Data	Data	Data
ZHVI Condo/Co-op Time Series (\$)	Data	Data	Data	Data	Data	Data
ZHVI Single-Family Homes Time Series (\$)	Data	Data	Data	Data	Data	Data
ZHVI 1-Bedroom Time Series (\$)	Data	Data	Data	Data	Data	Data

Metrics

- Zillow Home Value Index
- Zillow Rent Index
- Zillow Home Value Forecast
- Negative equity
- List prices
- Sale prices
- Rental prices
- Home sales
- \$ value/square foot
- \$ price/square foot
- % listings with price cuts
- % amount of listing price cuts
- % homes sold for loss/gain
- % homes foreclosed
- % sales that are foreclosure re-sales
- % homes increasing/decreasing in value
- % homes sold in the past year
- Price-to-rent ratios
- Price-to-income ratios
- Median rental listing prices by bedrooms
- For-sale inventory

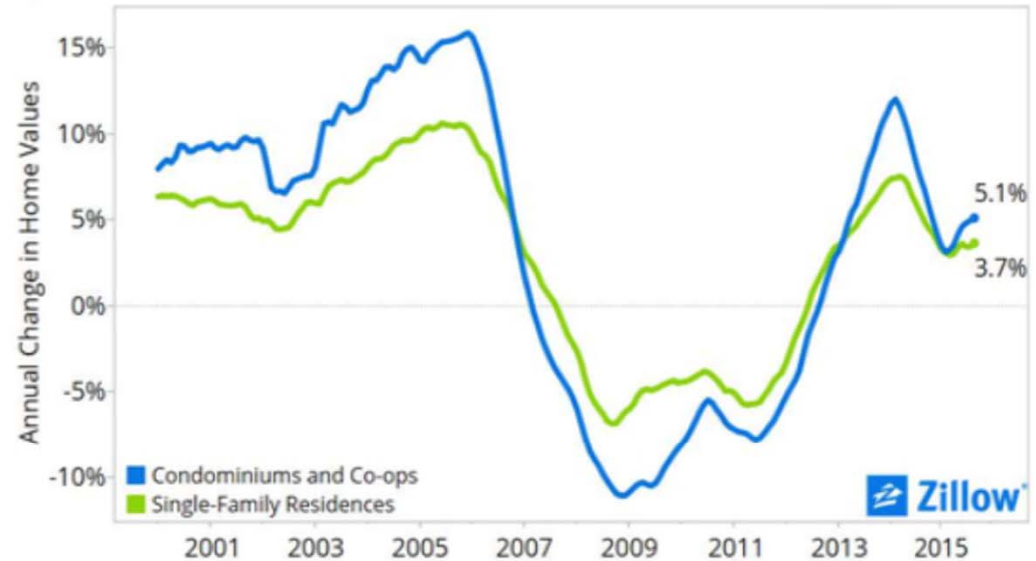
Zillow Home Value and Rent Indexes

Since bottoming, however, condo values have been on a tear.

Nationwide, condo values^[1] grew 5.1 percent year-over-year as of the end of the third quarter, compared to 3.7 percent year-over-year growth for single-family homes, according to Zillow's Q3 2015 Real Estate Market Report (figure 1). The typical U.S. condo is worth \$191,300 as of September, compared to \$181,500 for a single-family home. Overall, the median U.S. home value (condos, co-ops and single-family) rose 3.7 percent year-over-year, to a Zillow Home Value Index of \$182,500.

Annual growth in median condo values has equaled or exceeded growth in single-family home values for 32 straight months. The last time single-family home values grew more quickly year-over-year than condo values was in January 2013.

Figure 1: Annual Change in U.S. Condo and Single-Family Home Values
September 2015



The Zillow Home Value index is available at a monthly frequency for the nation, states, metro areas, counties, cities, ZIP codes and neighborhoods.

Academic Researchers

House of DEBT

Economic Commentary from Atif Mian and Amir Sufi

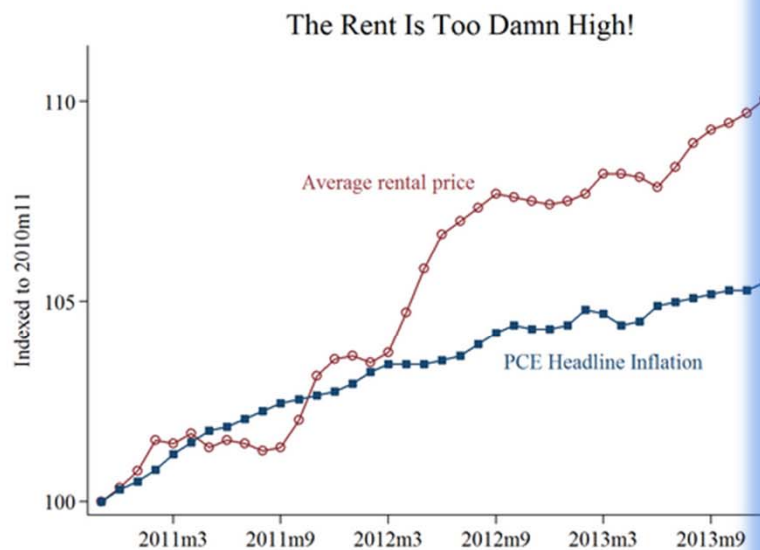
Where Is the Rent Too Damn High?

APRIL 29, 2014

BY ATIF MIAN AND AMIR SUFI

Several recent articles have noted a sharp rise in the price of renting an apartment or house across the United States. Many have also argued that the rise in rents disproportionately affects lower and middle-income households. We decided to take a look by examining the great data available on rents from Zillow.

The chart below shows general inflation (measured with PCE headline inflation) versus the increase in rents. The series are indexed to be 100 as of November 2010 (the first month the Zillow data are available). The chart is undeniable: rents are rising much more rapidly than other consumer prices.



houseofdebt.org, @AtifMian & @ProfSufi, Data source: Zillow for Rent, FRED Series PCEPI

Federal Reserve BULLETIN

November 2014
Vol. 100, No. 6

Board of Governors of the Federal Reserve System

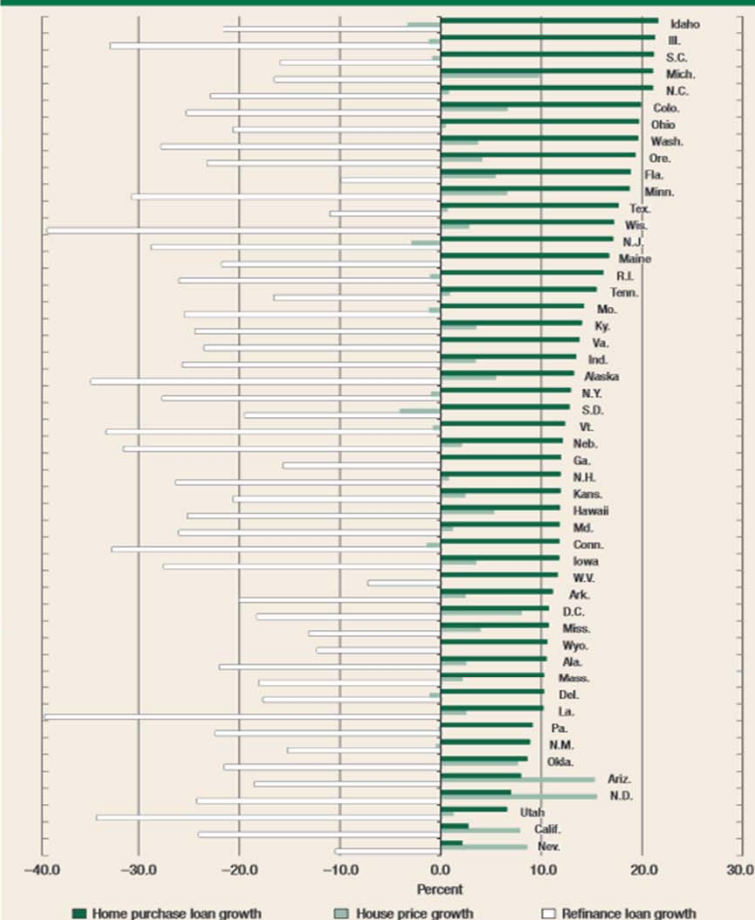
www.federalreserve.gov



The 2013 Home Mortgage Disclosure Act Data

Neil Bhutta and Daniel R. Ringo, of the Division of Research and Statistics, prepared this article. Madura Watanagase provided research assistance.

Figure 2. Growth in home-purchase and refinance lending, by state, 2012–13



Note: First-lien mortgage originations for one- to four-family properties. House price growth is measured as the rate of change in the Zillow Home Value Index for single-family residences from December 2011 to December 2012; house price growth data not available for Maine and Wyoming. Source: FRBEC HMDA data; Zillow.

Academic Researchers



A Living Database

The Zillow Transaction and Assessment Dataset (ZTRAX) is a trove of previously inaccessible or prohibitively expensive housing data Zillow is opening up to qualifying academic and institutional researchers **for free**

Zillow Government and Academic Collaborations



Duke
UNIVERSITY



UCLAAnderson
SCHOOL of MANAGEMENT



LESSONS

What we have learned along the way?

- How relevant is our experience?
 - Different in important ways but similar in many ways (more on next slide)
- Lack of consistency in local local data creates a challenge
 - Often forces usage of the lowest common denominator
- Need to understand if the problem is data vs analytics/modeling
 - Statistics vs Machine Learning
- The fixed vs variable costs of platforms/architecture
 - Flexibility of platform is paramount

Different but similar

Data Series	Current Source	Zillow Equivalent
Census/BLS/BEA		
Owners Equivalent Rent	Bureau of Labor Statistics - Consumer Price Index	Zillow Rent Index
Value of Housing Services	Bureau of Economic Analysis - Personal Consumption Expenditures	Zillow Rent Index
Estimated Value of Homes	American Communities Survey – Owner Estimate	Zestimate - Model Estimate
Year Built of Home	American Communities Survey	Zillow Living Database of All Homes
Real Estate Taxes	American Communities Survey	Zillow Living Database of All Homes
Other House Characteristics	American Communities Survey	Zillow Living Database of All Homes

Discussion questions

- What lessons can we learn from others' experiences?
- What does the ideal world look like?
 - Competing interests: respondent burden, accuracy, cost, etc.
 - Is there a model that does this well?
 - Long vs short term vision
- How to leverage this effort to build awareness of the data (how is it used and how can it be used)?
 - Potential for mutual benefit to administrative and other partners

