Housing and the Tech Boom:
Using LEHD and Zillow Data to Understand Market Impacts

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About Zillow Economic Research
Our Mission and Principles

Zillow Research Mission Statement:

“Zillow Research aims to be the most open, authoritative source for timely and accurate housing data and unbiased insight. Our goal is to empower consumers, industry professionals, policymakers and researchers to better understand the housing market.”

Our Research Principles:

1. Zillow Research provides unbiased data and analysis about the housing market in a transparent way. Whenever possible, the team makes code and underlying data available so work can be replicated independently. Methodology is always clearly explained.
2. Zillow Research is independent of Zillow’s business goals, and is not a revenue center.
3. Zillow Research is open about how data sources and data quality impact research, and is transparent about potential issues with data used.
4. Zillow Research benchmarks findings against outside datasets whenever possible to ensure accuracy and appropriate context.
5. Zillow Research respects the integrity of data and uses it honestly, and never manipulates data to create a desired result. We are data- and fact-driven.
Post-IPO, Home Values Grew Faster in Areas Home to Lots of Facebook Employees

BY JEFF TUCKER
Between March 2012 and March 2013, home values around likely Facebook employees climbed 21 percent, compared to 17 percent in all other Bay Area census tracts.
#TurnOnTheLights

Data

Home Values

Zillow Home Value Index (ZHVI): A smoothed, seasonally adjusted measure of the median estimated home value across a given region and housing type. It is a dollar-denominated alternative to repeat-sales indices. Zillow also publishes home value and other housing data for local markets, as well as a more detailed methodology and a comparison of ZHVI to the S&P CoreLogic Case-Shiller Home Price Indices.

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZHVI Summary (Current Month)</td>
<td>Metro &amp; U.S.</td>
</tr>
</tbody>
</table>

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Home Listings and Sales

Zillow provides data on sold homes, including median sale price for various housing types, sale counts (for which there's detailed methodology), and foreclosures provided as a share of all sales in which the home was previously foreclosed upon. There is also current and historical for-sale listings data, ranging from median list prices and inventory counts to share of listings with a price cut, median price cut size, age of inventory, and the days a listing spent on Zillow before the sale was final. Inventory and other housing data also are available for local markets.

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Sale Price - Seasonally Adjust</td>
<td>Metro &amp; U.S.</td>
</tr>
</tbody>
</table>

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Rental Values

Zillow Rent Index (ZRI): A smoothed measure of the median estimated market rate rent across a given region and housing type. ZRI is a dollar-denominated alternative to repeat-rent indices. Zillow publishes ZRI and other housing data for local markets as well as its ZRI methodology.

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZRI Summary: Multifamily, SFR, Condo</td>
<td>Metro &amp; U.S.</td>
</tr>
</tbody>
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Applications of LEHD data in Zillow’s real estate research
1. Housing and the Tech Boom
LODES: Labor Demand Shocks

South Lake Union and nearby areas have both the greatest density and the largest growth in residents who work in South Lake Union.

Distribution of SLU workers across census tract of residence, 2015

Average annual change in number of SLU workers by residence census tract, 2011-2015

LODES: Wealth Shocks

Home value growth in census tracts with Facebook employees outpaced other Bay Area census tracts
Home value growth index, (March 2012 = 100)

Source: Zillow Home Value Index
Key Takeaways

1. Significant, but small, effects on local housing markets
2. Macro housing market trends much more important
2. Price Elasticities
J2J: Price Elasticities of Demand

The Amazon Effect

Amazon plans to employ up to 50,000 people in a second headquarters location expected to be chosen later this year from one of the following metro areas.* That kind of growth will have an undeniable impact on the local housing market. Assuming Amazon adds those 50,000 employees steadily over time, here’s the estimated “Amazon Effect” on rents in each market -- the additional rental appreciation that could be expected, on top of what is already anticipated, as a result of Amazon moving in.

*Based on a recent Amazon news release.
J2J: Regional Migration and Housing Affordability

Sources: Zillow Mortgage Affordability data and Census Bureau, Longitudinal Employer Household Dynamics, Metro Job-to-Job flows, 2018 Q3.
3. Housing and Transit
## LODES: Cost vs Commute

### Median Price of a Home within Commuting Distance of the Downtown Core

<table>
<thead>
<tr>
<th></th>
<th>Denver, CO</th>
<th></th>
<th>San Francisco, CA</th>
<th></th>
<th>Seattle, WA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$/sqft</td>
<td>Necessary Income</td>
<td>$/sqft</td>
<td>Necessary Income</td>
<td>$/sqft</td>
<td>Necessary Income</td>
</tr>
<tr>
<td>15m to 30m</td>
<td>$420,300</td>
<td>$72,200</td>
<td>$1,569,400</td>
<td>$269,600</td>
<td>$890,200</td>
<td>$152,900</td>
</tr>
<tr>
<td>30m to 45m</td>
<td>$397,000</td>
<td>$68,200</td>
<td>$1,217,100</td>
<td>$209,100</td>
<td>$693,300</td>
<td>$119,100</td>
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<tr>
<td>45m to 60m</td>
<td>$433,700</td>
<td>$74,500</td>
<td>$1,074,200</td>
<td>$184,500</td>
<td>$663,200</td>
<td>$113,900</td>
</tr>
<tr>
<td>60m to 75m</td>
<td>$485,200</td>
<td>$83,400</td>
<td>$903,300</td>
<td>$155,200</td>
<td>$512,700</td>
<td>$88,100</td>
</tr>
</tbody>
</table>

*Median household income (2017):*

- **Denver, CO**: $76,643
- **San Francisco, CA**: $101,714
- **Seattle, WA**: $82,133

*Source:* Zillow home values and HERE Technologies commute times to “Downtown” core identified using LODES/WAC files.
LODES: Cost vs Commute

Source: Zillow home values and HERE Technologies commute times to “Downtown” core identified using LODES/WAC files.
LEHD: Where is “Downtown” Atlanta?

LEHD: Where is “Downtown” Atlanta?

LODES: Regional Transit Development

Thank you.
zillow.com/research