PHILADELPHIA HOUSE
PRICE INDICES

October 24, 2018

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Disclaimers and Acknowledgments: The Lindy Institute for Urban Innovation at Drexel University provides this report free of charge to the public. The report is produced by Kevin C. Gillen Ph.D.. The author thanks Azavea.com, the Philadelphia Office of Property Assessment, the Federal Housing Finance Agency, Case-Shiller MacroMarkets LLC, RealtyTrac, Zillow.com, Trulia.com and the NAHB for making their data publicly available. © 2016, Drexel University, All Rights Reserved.
These HPIs are current through 2016Q4 only.

"MSA"=Metropolitan Statistical Area, which is the entire 10-county region.

* Empirically estimated by Kevin C. Gillen, Ph.D.

**Courtesy of the Federal Housing Finance Agency (FHFA).
### Total House Price Appreciation Rates by Geographic Market

<table>
<thead>
<tr>
<th>Period</th>
<th>Philadelphia County*</th>
<th>Philadelphia MSA**</th>
<th>U.S.A.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>38-Year</td>
<td>172.2%</td>
<td>186.1%</td>
<td>147.1%</td>
</tr>
<tr>
<td>10-Year</td>
<td>23.6%</td>
<td>18.2%</td>
<td>23.2%</td>
</tr>
<tr>
<td>1-Year</td>
<td>0.0%</td>
<td>5.5%</td>
<td>6.3%</td>
</tr>
<tr>
<td>1-Quarter</td>
<td>2.1%</td>
<td>0.0%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

*Empirically estimated by Kevin C. Gillen Ph.D.

**Source: U.S. Federal Housing Finance Agency (FHFA). These numbers are through 2018Q2 only. “MSA”=“Metropolitan Statistical Area”, which is the entire 10-county region.
House Price Appreciation 1987-2018: Philadelphia v. 10-City Composite

<table>
<thead>
<tr>
<th>% Change</th>
<th>10-City</th>
<th>Philadelphia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998 to Peak</td>
<td>+172%</td>
<td>+137%</td>
</tr>
<tr>
<td>From Peak</td>
<td>-1%</td>
<td>+20%</td>
</tr>
</tbody>
</table>

*Source: S&P/Case-Shiller. The 10-City Composite index includes Boston, Chicago, Denver, Las Vegas, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, DC. It does not include Philadelphia.
YoY House Price Change (%) 1987-2018: Philadelphia v. 10-City Composite

This chart shows the percent change in the respective house price indices from one year ago, which proxies for the annual average house price appreciation rate in each market.

*Source: S&P/Case-Shiller. The 10-City Composite index includes Boston, Chicago, Denver, Las Vegas, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, DC. It does not include Philadelphia.
1980Q1=100

CtrCity/Fairmount
Kensington/Frankford
Lower NE Phila.
North Phila.
NW Phila.
South Phila.
Univ. City
Upper NE Phila.
West/SW Phila.
# Philadelphia House Price Appreciation Rates by Submarket

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>38-year</td>
<td>186.0%</td>
<td>183.7%</td>
<td>160.5%</td>
<td>182.7%</td>
<td>183.3%</td>
<td>223.0%</td>
<td>223.1%</td>
<td>180.6%</td>
<td>186.5%</td>
</tr>
<tr>
<td>10-year</td>
<td>20.7%</td>
<td>30.8%</td>
<td>21.2%</td>
<td>21.1%</td>
<td>3.9%</td>
<td>43.0%</td>
<td>45.8%</td>
<td>12.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td>1-Year</td>
<td>1.4%</td>
<td>7.0%</td>
<td>13.6%</td>
<td>6.6%</td>
<td>1.5%</td>
<td>1.0%</td>
<td>8.1%</td>
<td>7.8%</td>
<td>3.6%</td>
</tr>
<tr>
<td>1-Quarter</td>
<td>-1.3%</td>
<td>3.4%</td>
<td>2.5%</td>
<td>3.7%</td>
<td>0.7%</td>
<td>0.6%</td>
<td>6.2%</td>
<td>2.6%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

This table gives the total % change in average house values by submarket, through 2018 Q3, from different starting points in time.
Philadelphia Submarket Boundaries

Submarkets/Neighborhoods:
- Center City/Fairmount
- Kensington-Frankford
- Lower NE Phila.
- NW Phila.
- North Phila.
- South Phila.
- Univ. City
- Upper NE Phila.
- West/SW Phila.
Median Philadelphia House Price v. Indexed Philadelphia House Price
1980-2018

- Median Price
- Indexed Price*

* Empirically estimated by Kevin C. Gillen, PhD
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Q3
*Only arms-length transactions between private sector entities were included in these numbers.
Number of Philadelphia Home Sales\* per Quarter with Price>=$1 Million: 1997-2018

*Only arms-length transactions between private sector entities were included in these numbers.*
Center City House Sales in 2018 Q3

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.
South Philadelphia House Sales in 2018 Q3

$Price/SqFt

- $>200
- $140-200
- $105-140
- $55-105
- <$55

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

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West/SW Philadelphia House Sales in 2018 Q3

$Price/SqFt
- $200
- $140-200
- $105-140
- $55-105
- <$55

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

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North Philadelphia House Sales in 2018 Q3

$Price/SqFt

- $200
- $140-200
- $105-140
- $55-105
- <$55

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

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Kevin.C.Gillen@Drexel.edu
Northwest Philadelphia House Sales in 2018 Q3

$Price/SqFt

- >$200
- $140-200
- $105-140
- $55-105
- <$55

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

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Northeast Philadelphia House Sales in 2018 Q3

$Price/SqFt

- >$200
- $140-200
- $105-140
- $55-105
- <$55

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

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Kevin.C.Gillen@Drexel.edu
2018 Q3 House Price Rate of Change by Submarket

- Upper NE Phila: +2.6%
- Lower NE Phila: +2.5%
- North Phila: +3.7%
- Kensington/Frankford: +3.4%
- Center City/Fairmount: -1.3%
- South Phila: +0.6%
- NW Phila: +0.7%
- Univ. City: +6.2%
- West/SW Phila: +2.4%

Note: Each submarket is extruded by its average change in house values during 2018 Q3 in order to reflect its growth (or depreciation) rate relative to other neighborhoods.
### +$1 Million Dollar House Sales in 2018 Q3

<table>
<thead>
<tr>
<th>PRICE</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000,000</td>
<td>7703 LINCOLN DR</td>
</tr>
<tr>
<td>$1,000,000</td>
<td>2007 NORTH ST</td>
</tr>
<tr>
<td>$1,025,000</td>
<td>613 PEMBERTON ST</td>
</tr>
<tr>
<td>$1,025,000</td>
<td>7612 CHEROKEE ST</td>
</tr>
<tr>
<td>$1,050,000</td>
<td>2428 PINE ST</td>
</tr>
<tr>
<td>$1,050,000</td>
<td>1601 KATER ST</td>
</tr>
<tr>
<td>$1,070,000</td>
<td>801 S 20TH ST</td>
</tr>
<tr>
<td>$1,150,000</td>
<td>2122 GREEN ST</td>
</tr>
<tr>
<td>$1,161,500</td>
<td>352 S 04TH ST</td>
</tr>
<tr>
<td>$1,189,578</td>
<td>708 S AMERICAN ST</td>
</tr>
<tr>
<td>$1,200,000</td>
<td>8300 NAVAJO ST</td>
</tr>
<tr>
<td>$1,218,000</td>
<td>31 SUMMIT ST</td>
</tr>
<tr>
<td>$1,235,000</td>
<td>2112 LOMBARD ST</td>
</tr>
<tr>
<td>$1,237,618</td>
<td>1923 DELANCEY PL</td>
</tr>
<tr>
<td>$1,250,000</td>
<td>622 CATHARINE ST</td>
</tr>
<tr>
<td>$1,310,000</td>
<td>2061 LOMBARD ST</td>
</tr>
<tr>
<td>$1,320,400</td>
<td>1831 SPRUCE ST</td>
</tr>
<tr>
<td>$1,370,000</td>
<td>1232 SUMMER ST</td>
</tr>
<tr>
<td>$1,375,000</td>
<td>8319 SEMINOLE AVE</td>
</tr>
<tr>
<td>$1,500,000</td>
<td>316 S 10TH ST</td>
</tr>
<tr>
<td>$1,500,000</td>
<td>18 LAUGHLIN LN</td>
</tr>
<tr>
<td>$1,514,000</td>
<td>2420 SPRUCE ST</td>
</tr>
<tr>
<td>$1,520,000</td>
<td>1433 BAINBRIDGE ST</td>
</tr>
<tr>
<td>$1,525,000</td>
<td>262 S 03RD ST</td>
</tr>
<tr>
<td>$1,530,000</td>
<td>318 SAINT JAMES PL</td>
</tr>
<tr>
<td>$1,550,000</td>
<td>2101 LOCUST ST</td>
</tr>
<tr>
<td>$1,663,000</td>
<td>20 W CHESTNUT HI AVE</td>
</tr>
<tr>
<td>$1,727,300</td>
<td>2221 PINE ST</td>
</tr>
<tr>
<td>$1,865,500</td>
<td>711 SPRUCE ST</td>
</tr>
<tr>
<td>$1,875,000</td>
<td>2130 RACE ST</td>
</tr>
<tr>
<td>$2,400,000</td>
<td>2324 GREEN ST</td>
</tr>
<tr>
<td>$2,503,000</td>
<td>2502 DELANCEY PL</td>
</tr>
<tr>
<td>$2,750,000</td>
<td>713 SPRUCE ST</td>
</tr>
<tr>
<td>$2,905,000</td>
<td>2016 SPRUCE ST</td>
</tr>
</tbody>
</table>
The diffusion index measures how varied the direction of house price changes are across Philadelphia neighborhoods. It is computed as the percent difference between the number of neighborhoods in which prices rose in a given quarter, and the number of neighborhoods in which prices fell. A value of -100% indicates that prices fell in all neighborhoods in a given quarter, while a value of +100% indicates that prices rose in all neighborhoods. A value of 0% indicates that house price changes were evenly split between increases and decreases, across neighborhoods. Diffusion indexes are commonly used in financial economics as a leading indicator of turning points in a market's direction.
This chart compares the Philadelphia House Price Index (in red) to the percent of Philadelphia neighborhoods that experienced house price declines (in blue), in each quarter from 1980-2018.
The Dispersion Index measures how varied house price changes are across the city's neighborhoods. It is computed as the standard deviation of quarterly house prices changes across submarkets. High values of the index imply large variation in house price changes between different neighborhoods, while low values imply that house price changes are relatively the same across the city. High values of the index are often an indicator that the market is reaching a turning point; i.e. a peak or trough.
Philadelphia Housing Affordability* Index: 1980-2018

*Affordability is measured as the ratio of the median Philadelphia house price to the median Philadelphia household income. High values of the index mean that housing has become less affordable to the average Philadelphian. Contact Kevin.C.Gillen@Drexel.edu for details.
Average House Price-to-Rent Ratios*: 1980-2018
Philadelphia v. U.S.

*Computed by taking the ratio of average house price to the average annual rent of a comparable housing unit. The P/R ratio is to real estate what the P/E ratio is to other assets. Contact Kevin.C.Gillen@Drexel.edu for further details.
Inflation-Adjusted* Philadelphia House Price Index 1980-2018

1980Q1=100

*The empirically estimated house price index is deflated by the rate of inflation over time, using the national Consumer Price Index as the proxy for the national rate of inflation. This procedure converts the house price index from "nominal" to "real" terms, and thus shows house price changes net of general inflation.
"%Absorbed" is defined as the percent of homes listed for sale in a given month that also sold in that same month.

Source: Trend MLS
Months Supply of Inventory measures how many months it would take to completely burn off the existing inventory of homes currently listed for sale, given their current pace of sales. 5-7 months is considered a normal, balanced market. More than 7 months indicates a Buyer's market, and less than 5 months indicates a Seller's market.
Average Days-on-Market* for Philadelphia Homes

*Days-on-Market (DOM) is the average number of days it takes for a listed house to sell.

Source: Trend MLS
The Index represents the current sentiment of U.S. homebuilders. The index is computed via a regular monthly survey of homebuilders. An index value above 50 indicates that more builders are optimistic than pessimistic, while an index value below 50 indicates that more builders are pessimistic than optimistic.
The PHLX Housing Sector Index is a modified cap-weighted index composed of 20 companies whose primary lines of business are directly associated with the U.S. housing construction market. The index composition encompasses residential builders, suppliers of aggregate, lumber and other construction materials, manufactured housing and mortgage insurers.

*Structures with 1-4 dwelling units
**Structures with >=5 dwelling units

***Note: 2018 Numbers are YTD numbers through August 2018.
Sources: U.S. Census, Center City District
Zillow.com is currently forecasting Philadelphia house prices to rise an average of 12.8% over the course of the next twelve months. This is a slight downgrade from its previous forecast of 13.4% made three months ago. Zillow also currently rates the temperature of Philadelphia’s housing market as “Hot”, but its level of hotness is slightly less than its level of three months’ ago.

Source: http://www.zillow.com/philadelphia-pa/home-values/