PHILADELPHIA HOUSE PRICE INDICES

May 2, 2017

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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.

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Philadelphia County v. Philadelphia MSA and U.S. Average

* Empirically estimated by Kevin C. Gillen, Ph.D.
**Courtesy of the Federal Housing Finance Agency (FHFA).

These HPIs are current through 2016Q4 only.

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

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# 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>166.8%</td>
<td>177.7%</td>
<td>138.3%</td>
</tr>
<tr>
<td>10-Year</td>
<td>14.5%</td>
<td>9.0%</td>
<td>6.4%</td>
</tr>
<tr>
<td>1-Year</td>
<td>11.8%</td>
<td>7.4%</td>
<td>6.0%</td>
</tr>
<tr>
<td>1-Quarter</td>
<td>5.0%</td>
<td>0.4%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

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

**Source: U.S. Federal Housing Finance Agency (FHFA). These numbers are through 2016Q4 only. “MSA”=“Metropolitan Statistical Area”, which is the entire 10-county region.
House Price Appreciation 1987-2017: Philadelphia v. 10-City Composite

*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.
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 Phila.

* All indices empirically estimated by Kevin C. Gillen, Ph.D.

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# Philadelphia House Price Appreciation Rates by Neighborhood

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>38-year</td>
<td>181.6%</td>
<td>167.5%</td>
<td>148.8%</td>
<td>169.4%</td>
<td>176.4%</td>
<td>216.6%</td>
<td>186.1%</td>
<td>164.6%</td>
<td>177.2%</td>
</tr>
<tr>
<td>10-year</td>
<td>14.4%</td>
<td>12.0%</td>
<td>3.3%</td>
<td>2.7%</td>
<td>-1.0%</td>
<td>38.2%</td>
<td>12.6%</td>
<td>-5.1%</td>
<td>7.2%</td>
</tr>
<tr>
<td>1-Year</td>
<td>13.1%</td>
<td>13.8%</td>
<td>14.6%</td>
<td>12.6%</td>
<td>3.0%</td>
<td>14.0%</td>
<td>7.8%</td>
<td>0.6%</td>
<td>13.6%</td>
</tr>
<tr>
<td>1-Quarter</td>
<td>6.7%</td>
<td>10.5%</td>
<td>6.7%</td>
<td>0.5%</td>
<td>1.2%</td>
<td>9.0%</td>
<td>-9.0%</td>
<td>-1.9%</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

This table gives the total % change in average house values by neighborhood, through 2017 Q1, from different starting points in time.
Median Philadelphia House Price v. Indexed Philadelphia House Price
1980-2017

* Empirically estimated by Kevin C. Gillen, PhD
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Average House Price Minus Median House Price: 1980-2017
*Only arms-length transactions between private sector entities were included in these numbers.
*Only arms-length transactions between private sector entities were included in these numbers.*
Philadelphia House Sales in 2017 Q1

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu

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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Center City House Sales in 2017 Q1

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.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
South Philadelphia House Sales in 2017 Q1

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.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
West Philadelphia House Sales in 2017 Q1

$Price/SqFt
- >$180
- $125-180
- $85-125
- $50-85
- <$50

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.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
North Philadelphia House Sales in 2017 Q1

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.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
Northwest Philadelphia House Sales in 2017 Q1

$Price/SqFt

- >$180
- $125-180
- $85-125
- $50-85
- <$50

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.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@drexel.edu
Narberth
Northeast Philadelphia House Sales in 2017 Q1

$Price/SqFt

- >$180
- $125-180
- $85-125
- $50-85
- <$50

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.
2017 Q1 House Price Rate of Change by Neighborhood

- North Phila: +0.5%
- NW Phila: +1.2%
- West Phila: +7.9%
- Univ. City: -9.0%
- Lower NE Phila: +6.7%
- Kensington/Frankford: +10.5%
- South Phila: +9.0%
- Upper NE Phila: -1.9%
- Center City/Fairmount: +6.7%

Note: Each neighborhood is extruded by its average change in house values during 2017 Q1 in order to reflect its growth (or depreciation) rate relative to other neighborhoods.
+$1 Million Dollar House Sales in 2017 Q1

<table>
<thead>
<tr>
<th>PRICE</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000,000</td>
<td>2423 WAVERLY ST</td>
</tr>
<tr>
<td>$1,000,000</td>
<td>2129 RACE ST</td>
</tr>
<tr>
<td>$1,070,000</td>
<td>2416 NAUDAIN ST</td>
</tr>
<tr>
<td>$1,075,000</td>
<td>1436 BAINBRIDGE ST</td>
</tr>
<tr>
<td>$1,090,000</td>
<td>235 CATHARINE ST</td>
</tr>
<tr>
<td>$1,100,000</td>
<td>7312 EMLEN ST</td>
</tr>
<tr>
<td>$1,185,000</td>
<td>811 N FRANKLIN ST</td>
</tr>
<tr>
<td>$1,190,000</td>
<td>1521 BAINBRIDGE ST</td>
</tr>
<tr>
<td>$1,240,000</td>
<td>305 DELANCEY ST</td>
</tr>
<tr>
<td>$1,240,000</td>
<td>324 S 15TH ST</td>
</tr>
<tr>
<td>$1,250,000</td>
<td>737 S 04TH ST</td>
</tr>
<tr>
<td>$1,265,000</td>
<td>8702 SEMINOLE AVE</td>
</tr>
<tr>
<td>$1,275,000</td>
<td>2219 SAINT JAMES PL</td>
</tr>
<tr>
<td>$1,300,000</td>
<td>822 N AMERICAN ST</td>
</tr>
<tr>
<td>$1,300,000</td>
<td>1336 KATER ST</td>
</tr>
<tr>
<td>$1,300,000</td>
<td>8100 LINCOLN DR</td>
</tr>
<tr>
<td>$1,315,000</td>
<td>2063 LOMBARD ST</td>
</tr>
<tr>
<td>$1,320,000</td>
<td>527 PINE ST</td>
</tr>
<tr>
<td>$1,336,000</td>
<td>231 DELANCEY ST</td>
</tr>
<tr>
<td>$1,349,000</td>
<td>1337 BAINBRIDGE ST</td>
</tr>
<tr>
<td>$1,425,000</td>
<td>338 SPRUCE ST</td>
</tr>
<tr>
<td>$1,500,000</td>
<td>924 CLINTON ST</td>
</tr>
<tr>
<td>$1,600,000</td>
<td>2517 PANAMA ST</td>
</tr>
<tr>
<td>$1,650,000</td>
<td>230 S 04TH ST</td>
</tr>
<tr>
<td>$1,685,000</td>
<td>415 S 03RD ST</td>
</tr>
<tr>
<td>$1,750,000</td>
<td>2332 GREEN ST</td>
</tr>
<tr>
<td>$1,840,000</td>
<td>3 VALLEY VIEW RD</td>
</tr>
<tr>
<td>$1,925,000</td>
<td>2345 PENNSYLVANIA AVE</td>
</tr>
<tr>
<td>$2,000,000</td>
<td>1811 PINE ST</td>
</tr>
<tr>
<td>$2,875,000</td>
<td>607 SAINT ANDREW RD</td>
</tr>
</tbody>
</table>

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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 1980-2017.
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.

*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*: 1980-2017
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.
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. Note: the index underwent a significant rebalancing in January of 2006.
Building Permits Issued for Construction of Residential Units in Philadelphia: Single-Family v. Multifamily

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

***Note: 2017 Numbers are YTD numbers through February 2017.

Sources: U.S. Census
Center City District

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Zillow.com is currently forecasting Philadelphia house prices to rise an average of 3.5% over the next year, which is a downgrade from its previous forecast of 4.0% made three months ago. However, it has also recently upgraded its rating of Philadelphia’s market temperature from “Warm” to “Hot”.

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