



FEBRUARY 2017

## Reflation & the Housing Market

Recent [reports](#) indicate that consumer price inflation is rising, reigniting the reflation debate—whether or not we are shifting from a world of low consumer price inflation to one of moderate inflation. Rising inflation would have a significant impact on housing markets by driving up mortgage interest rates.

In this article, we review the reflation arguments and consider three scenarios corresponding to higher inflation, lower inflation, and stable inflation. We describe each scenario, include a qualitative assessment of its likelihood and provide estimates of how housing and mortgage markets would respond.

Low consumer price inflation in the United States has been helping to keep long-term interest rates near the lowest levels in at least a generation (See Sidebar for a detailed discussion on the primary measures of inflation and their differences). Over the past few years, forecasts of rising inflation and rising interest rates have been off the mark. Instead of rising, inflation and interest rates have persisted at low levels. The persistence of low inflation and low interest rates has led [some economists](#) to question whether low inflation and low interest rates have become a permanent feature of our modern economy.

Inflation remains low despite a labor market at full employment and accommodative monetary policy. The national unemployment rate at 4.8 percent is near many economists' estimates of the natural rate of unemployment; the level of unemployment consistent with stable inflation. At the same time, the Federal Reserve Open Market Committee (FOMC) has largely maintained the extraordinary monetary accommodation that they instituted during the Great Recession.

### Forecast Snapshot (February 2017)

Summary (annualized)	2016	2017	2018
30-year PMMS (%)	3.7	4.4	4.8
Total home sales (M)	6.01	5.90	6.02
House price growth (%)	6.4	4.9	3.8
Total originations (\$B)	2,125	1,545	1,500



Monetary policy accommodation includes low levels of the federal funds rate and a larger balance sheet of the Federal Reserve. Despite increases in December of 2015 and 2016, the federal funds rate remains low by historical standards and by [many measures](#) is consistent with monetary accommodation that would normally lead to higher inflation. As a result of quantitative easing efforts, the Federal Reserve also maintains a historically large balance sheet, currently approximately \$4.5 trillion including both treasury bills and mortgage-backed securities. Though the Federal Reserve is no longer adding to their balance sheet, reinvestment of principal results in substantial [monthly purchases](#) helping to keep long-term real interest rates low.

Full employment, monetary accommodation and quantitative easing all would traditionally lead to higher inflation, but up until the last quarter of 2016 inflation remained low. However, in recent months, inflation has started to show signs of finally increasing. What has changed?

The shift in the inflation outlook is partially due to the election of Donald Trump to the U.S. presidency. The details of possible fiscal policy changes remain unknown, but most analysts expect some combination of lower taxes and expanded spending on defense and infrastructure financed primarily with larger deficits. Additionally, trade policy could also contribute to higher inflation. To protect American manufacturing, President Trump has talked about raising import tariffs and renegotiating or exiting some trade deals. These moves could mean higher import prices and further inflationary pressures in the economy. However, some of the import price rise could be mitigated by a stronger U.S. dollar, which could appreciate further on protectionism, immigration reform, deficit spending and a near-full employment economy.

Rising inflation and inflation expectations could prompt the Federal Reserve to increase short-term rates. Increases in short term interest rates—or even the anticipation of possible increases—could boost long-term interest rates. Thus the outlook for interest rates and housing depends critically on whether or not inflation increases, or if the notion of rising inflation is [overwrought](#).

There are three paths inflation could tread on in 2017:

1. **Inflation heads higher:** Inflation is on the upswing and expansionary policy will contribute to materially higher inflation.
2. **Inflation retrenches:** The initial reaction to the U.S. election and the reflation trade was an over-reaction. Inflation drifts back down toward low levels of recent years.
3. **Major changes already baked in:** The initial reaction to the U.S. election priced accurately future economic events and inflation and interest rates hold about at the level where they are today.



## Inflation heads higher

While initial market reactions to the U.S. presidential election priced in future inflation, it might not have gone far enough. Expansionary fiscal policy could exceed what analysts have projected both in magnitude and speed. A large tax cut and major infrastructure bill passed in the early part of 2017 could surprise the markets and stoke further increases in inflation. Moreover, these policies could ignite increased confidence and economic growth resulting in more inflation. The Trump Administration could go forward with increased tariffs and exit or renegotiate major trade deals resulting in significant increases in import prices.

Inflation expectations could come unmoored. Immediately after the election, interest rates surged and have remained well above their level of a year ago. Inflation expectations have also been on the rise. For example, the [Survey of Consumer Expectations](#) from the Federal Reserve Bank of New York has reached its [highest level since mid-2015](#). Increased inflation expectations could fuel actual inflation and result in a self-reinforcing vicious circle.

Inflation increases more than a full percentage point from today. Higher inflation passes one-for-one into higher long-term interest rates like mortgage rates, and the 30-year fixed rate mortgage rise above 5.5 percentage points by the end of the year to the highest level since 2008. Higher income growth partially offsets higher mortgage rates, but not completely. Rapidly rising interest rates have a dramatic negative impact on housing and mortgage markets. Home sales and mortgage originations decline significantly. Mortgage originations fall by more than \$800 billion from their 2016 levels to less than \$1.2 trillion in 2017.

The likelihood of the higher inflation scenario is relatively low. Expansionary fiscal policy is unlikely to move quickly through Congress and even if a major bill is passed, most of the impact is likely to take effect in 2018 or later. Although inflation expectations have ticked up, they still remain contained and the Federal Reserve is likely to act quickly if they show signs of picking up rapidly.

## Inflation retrenches

Perhaps the reflation trade is overplayed. The U.S. president does have substantial powers but will need Congress to pass major fiscal policy. Divisions within the Republican caucus could lead to delays in major fiscal policy changes. Rather than shifting into higher growth and higher inflation, the U.S. economy could persist in middling growth and low inflation.

If no major legislation with expansionary fiscal policy appears imminent, the reflation trade could unwind. Interest rates could drift back down to the levels we saw last fall ahead of the U.S. election. The 30-year fixed mortgage falls back below four percent.



Housing and mortgage markets perform well under this scenario. Falling rates spur home sales and provide relief for prospective homeowners facing rising house prices. Refinance activity surprises on the upside, as it did in 2015 and 2016. Instead of declining 50 percent refinance originations fall only modestly and total mortgage originations top \$2 trillion in 2017.

As per our estimates, the likelihood of inflation retrenching is low. There has been a shift towards higher inflation expectations, albeit contained, which has started to show up in higher inflation numbers, especially as can be seen in the January consumer price index, which moved up to 2.5 percent on a year-over-year basis. Overall, we do expect inflation to be in the above two percent range for 2017.

### **Baseline: Major changes already baked in**

We could get some fiscal stimulus and see modest increases in inflation this year and next. But because financial markets have already anticipated many of these changes we don't get much increase in interest rates over the next two years.

Under this scenario, the FOMC raises rates two to three times this year and inflation increases by a small amount. Most of the short-term rate increases have been anticipated in long-term yields so long-term rates move less than short-term rates; the yield curve flattens.

Housing takes a small step back. Home sales fall by about three percent relative to 2016 levels. House prices continue to rise, but the pace of growth moderates. Construction, which remains well below long-run demand is minimally impacted.

Mortgage market activity, will be significantly reduced by higher rates. The slowdown in home sales is more than offset by higher prices, so purchase mortgage activity increases slightly. The higher rates will adversely impact refinance originations as discussed in [last month's outlook](#). Refinance originations decline by 53 percent from 2016 to 2017. Total mortgage originations fall to \$1.5 trillion in 2017, down from over \$2.1 trillion in 2016.

In our estimation this scenario is most likely and thus is consistent with this month's outlook. Inflationary pressures are building in the economy, but we expect increases to be gradual. We do think that the Administration will introduce and Congress will pass some expansionary fiscal policy, but most of the impact will be felt after this year.

However, housing market fundamentals are strong and we expect only a modest setback in 2017. Despite rising mortgage rates, we expect rising wages to bolster demand. After the shock of higher rates is absorbed in 2017, housing markets rebound in 2018. Mortgage activity will shift to a purchase dominated mix in 2017, with the lowest share of refinance activity since the 1980s.

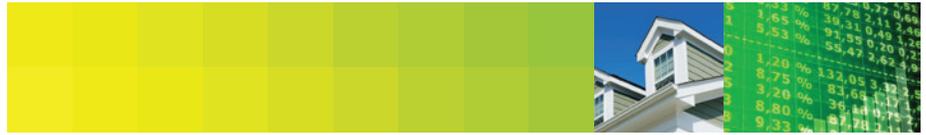


Exhibit 1

**Summary: Inflation Scenarios**

Scenario	Inflation heads higher	Baseline*	Inflation Retrenches
<b>Description</b>	Expansionary fiscal policy exceeds projections, large tax cuts & increased federal spending lead to higher growth and higher inflation.	Some fiscal stimulus passes through leading to a steady rise in inflation as per expectations.	Fiscal policy expansion falls short of expectations and/or is delayed leading to a lower growth and lower inflation environment.
<b>Likelihood</b>	Medium	High	Low
Real Growth (%)	Higher	2.2	Slightly lower
Mortgage Rates (30 year fixed)	Much higher	4.4	Slightly lower
<b>Impact</b>			
Home Sales (in millions)	Lower	5.9	Higher
Originations (\$ billion)	Much lower	1,545	Much higher
House Price Growth (%)	Much higher	4.9	Lower

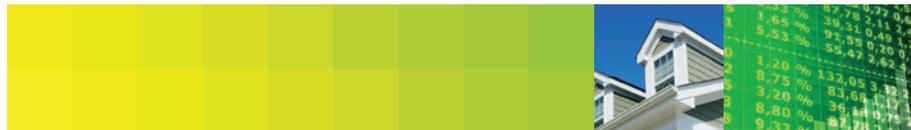
\*February 2017 Economic and Housing Research Outlook

Which course inflation takes over the next year will have important implications for housing and mortgage markets. (Exhibit 1 provides a summary on the various inflation scenarios, with the steady inflation scenario being our baseline forecast and the increasing and declining scenarios presented relative to the forecast). On balance, the risks to higher inflation outweigh lower inflation, but in our estimation most of the reflationary factors have already been baked into current interest rates and inflation is likely to increase only modestly over the next two years.

**Sidebar: The Inflation Gap**

Economists have devised a host of ways to measure inflation, each with its own merit and purpose,<sup>1</sup> but the two primary measures of inflation in the United States are the Consumer Price Index (CPI) and the Personal Consumption Expenditures Chain-type Price Index (PCE). The CPI is what is usually tracked and reported by the media, but the Federal Reserve tracks the PCE measure of inflation.

<sup>1</sup> Some of the other measures of inflation are: GDP deflator, Producer price index, the CPI for Urban wage earners and clerical workers (CPI-W), Trimmed mean PCE, Wage price Inflation.



The Federal Reserve moved to the PCE measure of inflation in 2000, prior to which it was tracking CPI. Three main reasons were cited for this move:<sup>2</sup>

- PCE better reflects the changing composition of spending and avoids the upward bias associated with the fixed weights in CPI.
- PCE weights are based on a more comprehensive measure of expenditure.
- PCE data can be revised to account for newly available information and for improvements in measurement techniques.

If both CPI and PCE measure the changes in the price of a basket of goods and services, why does the difference arise? The difference between CPI and PCE arises mainly due to the coverage of goods and services, the formulas used to compute these indices, and the weights assigned to the various goods and services within each of the index. PCE has a broader coverage of goods and services than CPI. Whereas CPI captures only out-of-pocket spending by households, PCE also includes expenditures made on behalf of consumers by employers and the government. As an example, if we consider health care expenses, CPI captures only the amounts paid by consumers, whereas PCE also includes the amounts spent by the employer and the insurance company on behalf of the consumer.

PCE uses a chained approach to compute the change in prices from one period to the next, which allows for substitution from more expensive to relatively cheaper ones. The weights are therefore updated every quarter to capture the changing nature of household spending. On the other hand, the CPI basket is fixed, where the weights are updated once every two years. The following is an example to illustrate differences in a fixed weight versus a chained weight index. Assuming a two good economy—shoes and hamburgers; and everything else remaining the same, we show how these indices are computed assuming period 1 as the base (100):

Item	Period 1		Period 2	
	Quantity	Price (\$)	Quantity	Price (\$)
Shoes	5	1	2	2
Hamburgers	5	4	3	5

Period 1 price Index = 100

$$\text{Price Index} = \frac{\sum P_t Q_0}{\sum P_0 Q_0}$$

$$\text{Price Index} = ((5*2+5*5) / (5*1+5*4))*100 = 140$$

$$\begin{aligned} \text{Chained weighted index: } & \sqrt{\frac{\sum P_t Q_{t-1}}{\sum P_{t-1} Q_{t-1}} * \frac{\sum P_t Q_t}{\sum P_{t-1} Q_t}} = \sqrt{\frac{2*5+5*5}{1*5+4*5} * \frac{2*2+5*3}{1*2+4*3}} \\ & = 1.378*100 = 137.8 \end{aligned}$$

<sup>2</sup> <https://www.federalreserve.gov/boarddocs/hh/2000/February/FullReport.pdf>

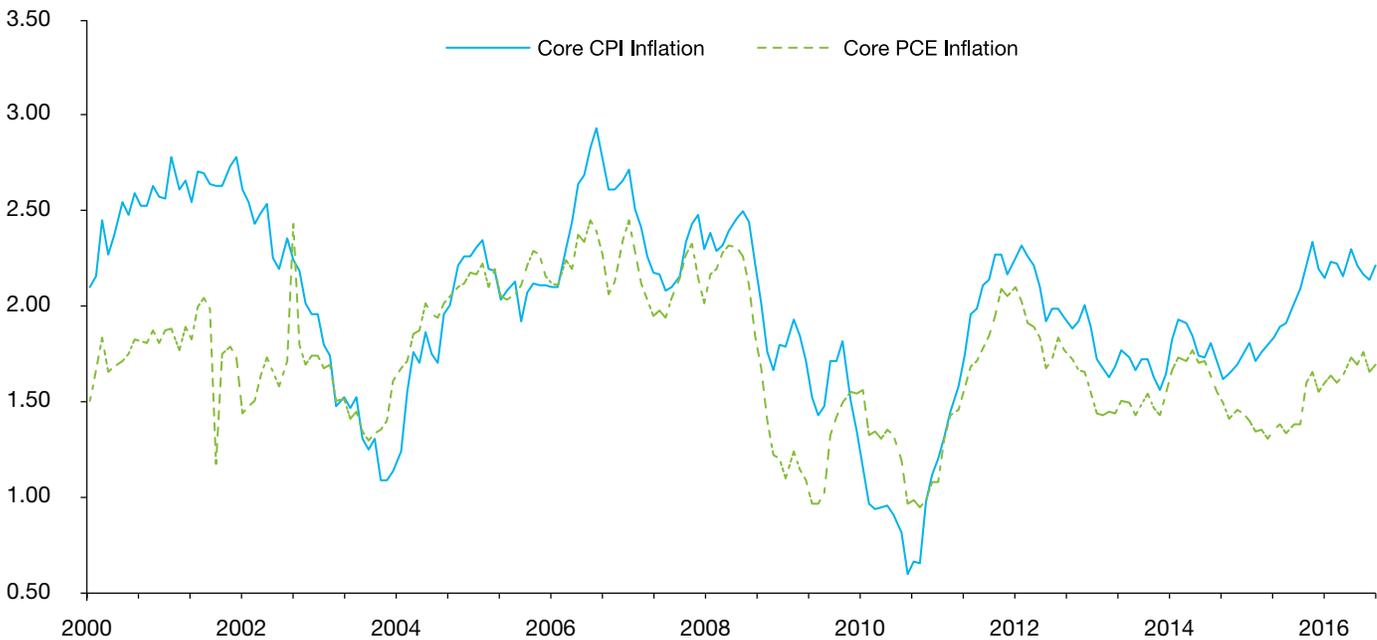


With the chained weight index, the substitution away from the more expensive shoes was captured in the index, which was lower than the regular price index.

Both CPI and PCE are buffeted by volatile movements in food and energy prices. To help smooth out volatility, analysts often look at “core” inflation measures. Core price indices exclude food and energy components and both the PCE and CPI have a core flavor.<sup>3</sup> Exhibit 2 displays the relationship between year-over-year percentage increases in core CPI and core PCE.

Exhibit 2

Core CPI and Core PCE



Source: Bureau of Labor Statistics

Exhibit 2 shows that there is a persistent gap between core CPI and core PCE inflation. Of all factors explaining the differences between CPI and PCE, the weights assigned to the components in the baskets explain most of the difference in these indices. And within weights, the weight of shelter

<sup>3</sup> Within the CPI there are a legion of sub-indices tracking inflation in different sectors of the economy and for different geographic areas. See for example: [https://www.bls.gov/cpi/cpifaq.htm#Question\\_20](https://www.bls.gov/cpi/cpifaq.htm#Question_20)



has contributed to more than 50 percent to the difference between these indices since 2002. On average, the contribution of weights to the difference between the two indices was 0.40 percentage points, of which around 0.37 percentage points was due to shelter. Since CPI captures an individual household's expenses and because rent takes up a large portion of household expenditure, shelter has a 33 percent weight in CPI whereas its weight in PCE is only around 15 percent. CPI is therefore more sensitive to movements in rents as compared to PCE.

Why should we care about this gap? Fed's preferred metric, the core PCE index has a target of 2 percent inflation. It is possible, perhaps even likely that CPI inflation could run above two percent while PCE inflation remained below two percent.

Core CPI has been rising at above two percent on a year-over-year basis since late 2015 while core PCE has not been above two percent since 2012. This gap is driven almost entirely by shelter. Shelter has been rising well above general inflation for the past 4 years at an average year over year rate of 2.75 percent. If things continue as they have, we might expect to see CPI inflation remain above two percent while PCE remains below two percent. A persistent shortfall of housing supply relative to demand could keep the pressure on shelter prices and maintain the wedge between CPI and PCE for an extended period, which would have important implications for how Fed policy may evolve over the next two years, and all that it implies for the future of the housing and mortgage markets.



## February 2017 Economic & Housing Market Forecast

Forecasted Figures

Historical Data

As of 2/8/2017

Indicator	2016				2017				Annual Totals		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2016	2017	2018
Real GDP (%)	0.8	1.4	3.5	1.9	1.9	2.3	2.3	2.2	1.9	2.2	2.1
Consumer Prices (%) a.	-0.3	2.5	1.6	3.4	2.4	2.3	2.1	2.2	1.8	2.2	2.4
Unemployment Rate (%) b.	4.9	4.9	4.9	4.7	4.8	4.8	4.7	4.7	4.9	4.8	4.6
30-Year Fixed Mtg. Rate (%) b.	3.7	3.6	3.5	3.8	4.3	4.4	4.5	4.5	3.7	4.4	4.8
5/1 Hybrid Treas. Indexed ARM Rate (%) b.	2.9	2.8	2.8	3.0	3.4	3.5	3.6	3.8	2.9	3.6	4.1
10-Year Const. Mat. Treas. Rate (%) b.	1.9	1.8	1.6	2.1	2.5	2.6	2.7	2.7	1.9	2.6	3.0
1-Year Const. Mat. Treas. Rate (%) b.	0.6	0.6	0.6	0.8	1.0	1.1	1.4	1.6	0.7	1.3	2.0
Housing Starts c.	1.15	1.16	1.14	1.22	1.22	1.25	1.27	1.30	1.17	1.26	1.36
Total Home Sales d.	5.83	6.07	5.97	6.14	6.10	5.90	5.80	5.80	6.01	5.90	6.02
FMHPI House Price Appreciation (%) e.	1.6	1.3	1.6	1.8	1.4	1.3	1.1	1.0	6.4	4.9	3.8
1-4 Family Mortgage Originations f.											
- Conventional	\$295	\$432	\$466	\$458	\$238	\$341	\$341	\$251	\$1,651	\$1,171	\$1,174
- FHA & VA	\$95	\$113	\$134	\$132	\$97	\$102	\$91	\$84	\$474	\$374	\$326
- Total	\$390	\$545	\$600	\$590	\$335	\$443	\$432	\$335	\$2,125	\$1,545	\$1,500
Refinancing Share - Originations (%) g.	51	44	47	50	39	27	24	21	48	27	20
Residential Mortgage Debt (%) h.	0.9	2.4	3.7	3.7	3.8	4.0	4.2	4.3	2.7	4.1	4.7

Note: Quarterly and annual forecasts are shown in shaded areas; totals may not add due to rounding; quarterly data expressed as annual rates. Annual forecast data are averages of quarterly values; annual historical data are reported as Q4 over Q4.

- a. Calculations based on quarterly average of monthly index levels; index levels based on the seasonally-adjusted, all-urban consumer price index.
- b. Quarterly average of monthly unemployment rates (seasonally-adjusted); Quarterly average of monthly interest rates (not seasonally-adjusted).
- c. Millions of housing units; quarterly averages of monthly, seasonally-adjusted levels (reported at an annual rate).
- d. Millions of housing units; total sales are the sum of new and existing single-family homes; quarterly averages of monthly, seasonally-adjusted levels (reported at an annual rate).
- e. Quarterly growth rate of Freddie Mac's House Price Index; seasonally-adjusted; annual rates for yearly data.
- f. Billions of dollars (not seasonally-adjusted).
- g. Home Mortgage Disclosure Act for all single-family mortgages (not seasonally-adjusted); annual share is dollar-weighted average of quarterly shares (2014 estimated).
- h. Federal Reserve Board; growth rate of residential mortgage debt, the sum of single-family and multifamily mortgages (not seasonally-adjusted, annual rate).

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## Economic & Housing Research **Outlook**

Prepared by the Economic & Housing Research group

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