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Issue Brief

The Housing Affordability Index: A Case of Economic Malpractice

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Executive Summary

Analysts have often used the Housing Affordability Index (HAI) as a measure to assess whether homes are reasonably priced. This is an improper use of the HAI because it fails to take account of how inflation (or lack of inflation) will affect the affordability of a mortgage payment through time. In a higher inflation environment, a fixed monthly mortgage payment becomes much more affordable through time, since nominal income will typically increase roughly in step with the rate of inflation. However, when inflation is low, the burden posed by the mortgage payment will change little through time, because income will not be growing as rapidly. Economic and financial analysts who use the HAI as a measure of whether houses are properly priced are misleading the public.

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All economists know that inflation affects the value of money through time. That is why economists are always careful to distinguish between changes that are just due to inflation and changes that reflect real gains. For example, when Social Security benefits rise by 2 percent next year, this is a change that is intended to keep beneficiaries' income in step with the higher prices they must pay. It is not a "real" increase in their income, since the higher benefit allows them to purchase just as much as they did with their smaller benefit last year, before prices rose. By contrast, if Congress voted to increase benefits by 2 percent, in addition to the annual inflation adjustment, this would be a real increase in the size of the benefit which would allow beneficiaries to enjoy a higher real income.

This distinction is basic and well known to anyone with training in economics. It is standard practice for economists to adjust income or spending that takes place in different years for inflation, so that these figures can be compared directly in real terms. In fact, adjusting for inflation is so widely accepted as a way of evaluating streams of money through time that it is difficult to understand why anyone would *not* adjust their data for the effects of inflation.

In spite of the standard practice in the economics profession, a commonly used measure of housing affordability, the "Housing Affordability Index" (HAI) does not adjust for the effects of inflation through time.[2] The HAI is calculated each month by the National Association of Realtors. This index calculates a monthly mortgage payment on a typical home, by using the average mortgage interest rate in the country and the median sale price of an existing home. This monthly mortgage payment is then divided by the median family's monthly income. When this ratio—mortgage payment to family income—is low, then the affordability index is high, which is taken to mean that housing is relatively affordable.

This assessment using the HAI has been important recently, because there has been considerable discussion in the business press about the possibility of a bubble in the housing market. The basic case for such a bubble is the fact that home prices have risen much more rapidly than the overall rate of inflation over the last seven years. The price of a typical home has risen by 30 percentage points more than the rate of inflation during this period (see Baker 2002).[3] Such a run-up in housing prices is unprecedented in the post-war era.

An obvious explanation for such a run-up is that, just as was the case with Japan, a stock market bubble fed over into a housing bubble. People who had made large gains in the market started buying bigger and better homes, which pushed up prices. As more people began to see home prices rise, they came to expect increases in housing prices. This meant that they were

[2] The description, and current and past measures, of the HAI can be found at http://www.realtor.org/research.nsf/pages/HousingInx?OpenDocument= .

[3] This measure is based on the Office of Federal Housing Enterprise Oversight's home price index. This index tracks the resale prices of the same houses through time. It is therefore not affected by most changes in the size or quality of homes through time. The case for the existence of a housing bubble can be found in, "The Run-Up in Home Prices: Is It Real or Is It Another Bubble?" Center for Economic and Policy Research, 2002 [http://www.cepr.net/Housing%20Bubble.pdf].

willing to bid more on a house than if they just expected the price to remain flat. While such a bubble must inevitably burst when there are no more buyers to be found—just like a stock bubble—it can continue to expand for some time. At present, the rise in home prices has created approximately $3 trillion in additional housing wealth, compared to a scenario in which home prices had just kept pace with inflation.

A housing bubble presents the same sort of dangers as a stock bubble. It distorts investment decisions and can lead to a significant over-building of homes. More importantly, tens of millions of homeowners are likely to assume that the run-up in their home price will persist. This can lead them to take out loans against the increased value of their home to finance consumption spending like buying a new car or a vacation. Or, homeowners may see less need to save for retirement because they think that they will be able to sell their home at its bubble-inflated price. In short, as a result of a housing bubble, tens of millions of homeowners may be spending beyond their means. They would risk serious financial hardship if housing prices eventually tumble as a bubble deflates.

The enormous consequences of a collapse of a housing bubble make it important to try to determine whether there is in fact a housing bubble. Many economic and financial analysts have pointed to the high level of the HAI to make the case that there is no housing bubble.[4] The HAI shows a high affordability measure in spite of the run-up in housing prices, because mortgage interest rates are at 30-year lows. However, this measure of housing affordability is extremely misleading, precisely because the HAI does not account for the effects of inflation. The failure to account for inflation causes the HAI to present an inaccurate assessment of housing affordability at present.

The logic of this point is straightforward. As noted earlier, the affordability index is currently high in large part because mortgage interest rates are so low. Mortgage interest rates in turn, are low in large part because inflation is low. Mortgage interest rates usually include a premium of 4 to 5 percentage points above the rate of inflation. When the inflation rate is low, as it is now, then the nominal mortgage interest rate is low.

However, at any specific interest rate, homeowners will benefit from having a higher rate of inflation. Homeowners will benefit from inflation in two ways. Typically home prices will rise at approximately the same rate as the overall rate of inflation. This means that with a higher rate of inflation, homeowners will accumulate equity in their homes more quickly. Second, wages typically rise more or less in step with the rate of inflation. This means that with a fixed mortgage rate, the monthly payment will come to be a much smaller share of income through time in a high-inflation environment than in a low inflation environment.

This point can be illustrated with a simple example. The current interest rate on a thirty-year mortgage is approximately 6.0 percent. The current inflation rate is approximately 2.0 percent. At this interest rate, if a homebuyer bought a $200,000 home, and paid $20,000 as a down payment (10 percent of the purchase price), they would face a monthly payment of $1079

[4] The HAI has often found its way into news reports on whether housing is overpriced (e.g. "Pent-Up Demand Sweeps Silicon Valley," *Washington Post*, 5-18-02;H11 or "Housing Starts Jump 13.3% Helping Lift the Economy," *New York Times*, 10-18-02).

on a $180,000 loan (the $200,000 sale price minus the $20,000 down payment). The left half of the table below shows how equity would build up through time in this scenario, assuming that the home price increases at 2.0 percent annually, the same as the overall rate of inflation. It is assumed that the homebuyer has a monthly income of $3,000, which rises by 1 percentage point more than the annual rate of inflation, in keeping with recent experience.

The right side of the table shows a scenario in which the interest rate on a thirty-year mortgage is 10 percent. In this scenario, it is assumed that the inflation rate is 5.0 percent. This means that the real interest (the mortgage interest rate minus the rate of inflation) is 5.0 percent, a full percentage point higher than the 4.0 percent real interest (6.0 percent mortgage rate minus 2.0 percent inflation rate) in the first situation shown on the left side.[5] In this case it is assumed that the amount borrowed is $122,970 (90 percent of a purchase price of $136,640), which would give the same monthly payment of $1079 as in the scenario shown on the left side of the table. The value of the home is assumed to rise at the rate of inflation, as in the scenario shown on the left side of the table. The homebuyer's monthly income in this scenario is also assumed to be $3,000, and to rise by 1 percentage point more than the rate of inflation.

Year	Equity/ Value	Payment/ Income	Equity/ Value	Payment/ Income
	6 % interest/ 2% inflation		10 % interest/ 5% inflation	
5	22.6%	32.0%	28.5%	28.5%
10	37.0%	27.6%	47.2%	21.3%
15	51.5%	23.8%	62.9%	15.9%
20	66.6%	20.5%	76.3%	11.9%
25	82.6%	17.7%	88.5%	8.9%
30	100.0%	15.3%	100.0%	6.6%

Source: Author's calculations.[6]

As the table shows, the percentage of the home that is paid off rises much more rapidly in the high inflation scenario shown on the right side. After 10 years, the homebuyer will have an equity stake equal to 47.2 percent of the value of their home in the high inflation scenario shown on the right side. By contrast, in the low inflation scenario on the left side, the homeowner's equity will be equal to just 37.0 percent of the home's value after 10 years. This gap persists, with ratio of equity to value more than 10 percentage points higher in the high inflation scenario, until after 20 years, when the mortgages are getting close to being paid off. The reason for this is straightforward—the high inflation in the scenario shown on the right side of the table is directly adding equity for the homeowner. The value of the mortgage is fixed, while the value of the home rises with the rate of inflation.

[5] A higher inflation rate does not imply a higher real interest rate. The use of a higher real interest rate in the high inflation scenario is intended to make the comparison more favorable to the low inflation scenario.

[6] It is relatively easy to set up a spreadsheet program to determine the monthly mortgage payment that will pay off a fixed rate mortgage over a 30 year period. There are also many sites on the web which offer mortgage calculators which can be used for this purpose [e.g. http://www.interest.com/calculators/].

Not only is the homeowner paying off her loan much more quickly in the high inflation scenario, the monthly payments are also rapidly becoming less burdensome through time. While the payments start out as being the same share of income in both scenarios, the homebuyer's income is rising much faster in the scenario on the right. Again, since the mortgage payment is fixed at the onset, the share of income needed to pay the mortgage falls rapidly. While the payment consumes 33.3 percent of income in the first year, after 10 years it is equal to just 21.3 percent of the homebuyer's income. After 20 years, the mortgage payment is equal to just 11.9 percent of the homebuyer's income.

In the low inflation/ low interest rate scenario shown on the left, the share of income devoted to mortgage payments also falls, but far less rapidly. After 10 years, the mortgage payment is equal to 27.6 percent of the homebuyer's income, and even after 20 years it is equal to 20.5 percent of the homebuyer's income. To put this comparison slightly differently, if the homebuyer in the high inflation/ high interest rate scenario took out a loan that was 1.5 times as large as the loan described in the table, her burden would be the same share of her income after 15 years as it is in the low inflation/interest scenario. After 25 years, it would take a mortgage that is twice as large as the one described in the table, to make the burden as large in the high inflation/high interest rate scenario as the burden in the low inflation/low interest rate scenario.

The fact that the interest burden falls rapidly in the high inflation scenario is extremely important both to the homeowner and the economy as a whole. From the standpoint of the homeowner, it means that the burden of getting a new home diminishes quickly through time, as the mortgage payment ties up a smaller share of her income. From the standpoint of the economy as a whole, this means that current debt levels are less of a strain on consumers, since the normal growth of income—most of it due to inflation—will quickly reduce the size of the debt burden. This will allow homeowners to begin to spend more on other items, as the share of income tied up in debt repayments shrinks through time.

In short, while the HAI implies that the two purchases shown in the table are equally affordable, the reality is that the home purchase in the high inflation/high interest scenario is far more affordable. The homebuyer in this scenario will accumulate equity in her home at a much more rapid rate, with the ratio of equity to value rising above 50 percent in just over ten years. In the low inflation/low interest rate scenario, the ratio of equity to value does not exceed 50 percent until the 15th year. More importantly, the burden posed by the monthly mortgage payments falls sharply in the high inflation/high interest rate scenario. After 10 years the burden has fallen back to just over 20 percent of the homebuyer's income, and after 20 years the mortgage payment is less than 12 percent of the homebuyer's income.

Since the HAI only examines the ratio of the mortgage payment to current income, it cannot provide any useful information about how affordable a house will be over the life of a mortgage. As any economist would immediately recognize, it is necessary to include projections of home price appreciation and income growth, to seriously analyze this issue. The relatively high measures shown on the HAI at present are extremely deceptive, since the current low inflation environment means that house prices are likely to appreciate at a very slow pace, even if we do not assume that prices have already been inflated due to a bubble. It also means that

nominal income will grow very slowly, so that the burden posed by the current monthly mortgage payment will be reduced very slowly through time.

The HAI may be a useful measure to determine the ability of new homebuyers to purchase housing, since banks will not issue mortgages that require payments beyond a fixed percentage of the borrower's income. However, the HAI clearly fails as a measure to determine whether home prices are properly valued since it does not incorporate the effects of inflation. This inadequacy is so apparent that it is difficult to understand why any economic analyst would attempt to use the HAI as a measuring stick for housing prices.