



## Has the Recent Real Estate Bubble Biased the Output Gap?

The output gap is the difference between actual gross domestic product (GDP) and the economy's potential output at a given moment in time. The Congressional Budget Office (CBO) estimates a very large and negative output gap for 2009's second quarter: -6.7 percent. Because this (predicted) output gap is so large, several analysts have concluded that monetary policy can remain very accommodative without fear of inflationary repercussions. We argue instead that standard output gap measures may be severely biased by the bubble in real estate prices that, according to many, started around 2002 and burst in 2007.

One difficulty in estimating output gaps is that a key component—potential output—is defined as the GDP attainable when the economy is operating at a high rate of resource use. Because economies are subject to the effects of recurrent external forces, actual GDP is typically not at its full potential. This implies that we cannot really ever observe potential output and, hence, it must be approximated. The first method to do this consists of identifying potential output according to long-term trends in GDP. The second method—the production function approach—is based on a relation between available productive inputs (such as capital and labor), their current utilization rates, and aggregate production.

Components of existing statistical methods to estimate potential output are typically subject to inertia. Hence, if the recent real estate bubble increased GDP and productive inputs to levels higher than what would be expected by economic fundamentals, then it is likely that potential output estimates will also be beyond what economic fundamentals would imply. Thus, these estimates would be biased. One way to better understand how bubbles affect key macroeconomic indicators is to consider that high growth in real estate prices may affect GDP not only through the increase in the value of residential services, but also through its indirect impact on higher-than-usual growth in (i) the finance and insurance sector and (ii) consumption—the latter caused by perceived increases in personal wealth.

Knowing the exact rate at which the economy would have grown without a bubble might be impossible. Nevertheless, we construct two estimates of potential output that we consider reasonable and “bubble-free.”

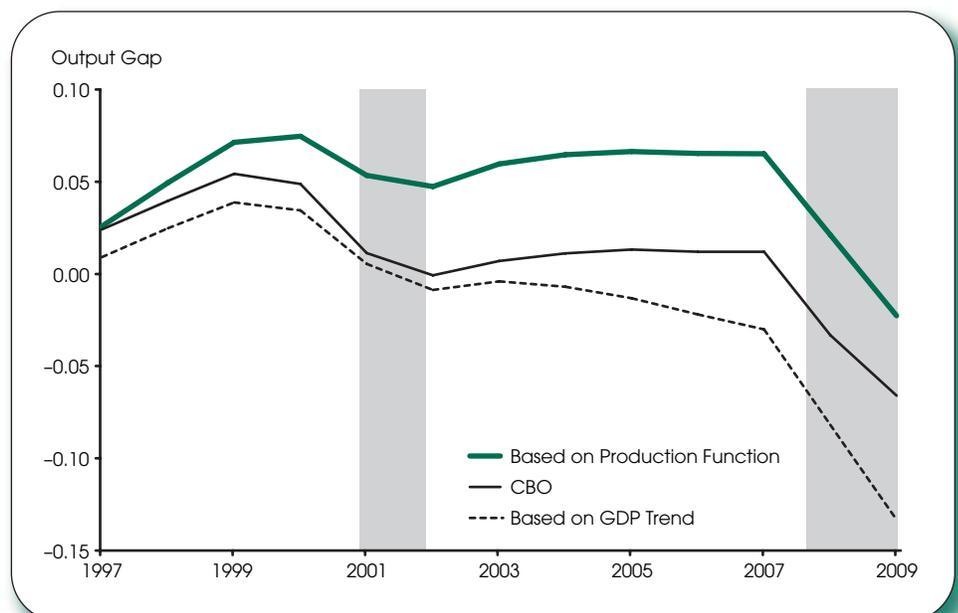
These estimates are based on the long-run trends<sup>1</sup> of GDP and capital stock up to 2002, before the bubble began. We call the difference between our artificial constructs and actual GDP our “bubble-free” output gaps. Our results are summarized in the chart.

Our output gap estimate based on GDP growth trends during the 50 years preceding the real estate bubble yields an output gap more negative than the CBO's estimate. Why the difference? Growth during 2002-09 was relatively weak compared with the past 50 years. Notably, this estimate also has the undesirable characteristic of being sensitive to the period chosen to estimate GDP growth trends. In contrast, the output gap based on the production function approach, after adjusting the value of inputs for possible bubbles, results in an output gap less negative (and positive through 2008) than the CBO's estimate. Hence, two reasonable methods yield opposite conclusions about the output gap. At the very least, we can say that the confidence intervals for the output gap seem to be wide.

Our results add to a long list of practical problems in precisely measuring the output gap. We offer a word of caution to policymakers: Policies based on point estimates of the output gap may not rest on solid ground.

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<sup>1</sup> The long-run trends for both estimates were constructed using the Hodrick-Prescott filter; we use the average growth rate from 1950-99 as the long-run growth rate.



Views expressed do not necessarily reflect official positions of the Federal Reserve System.