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PRICES AND SPENDING

# Examining trends in the nonresidential building construction producer price indexes (PPIs)

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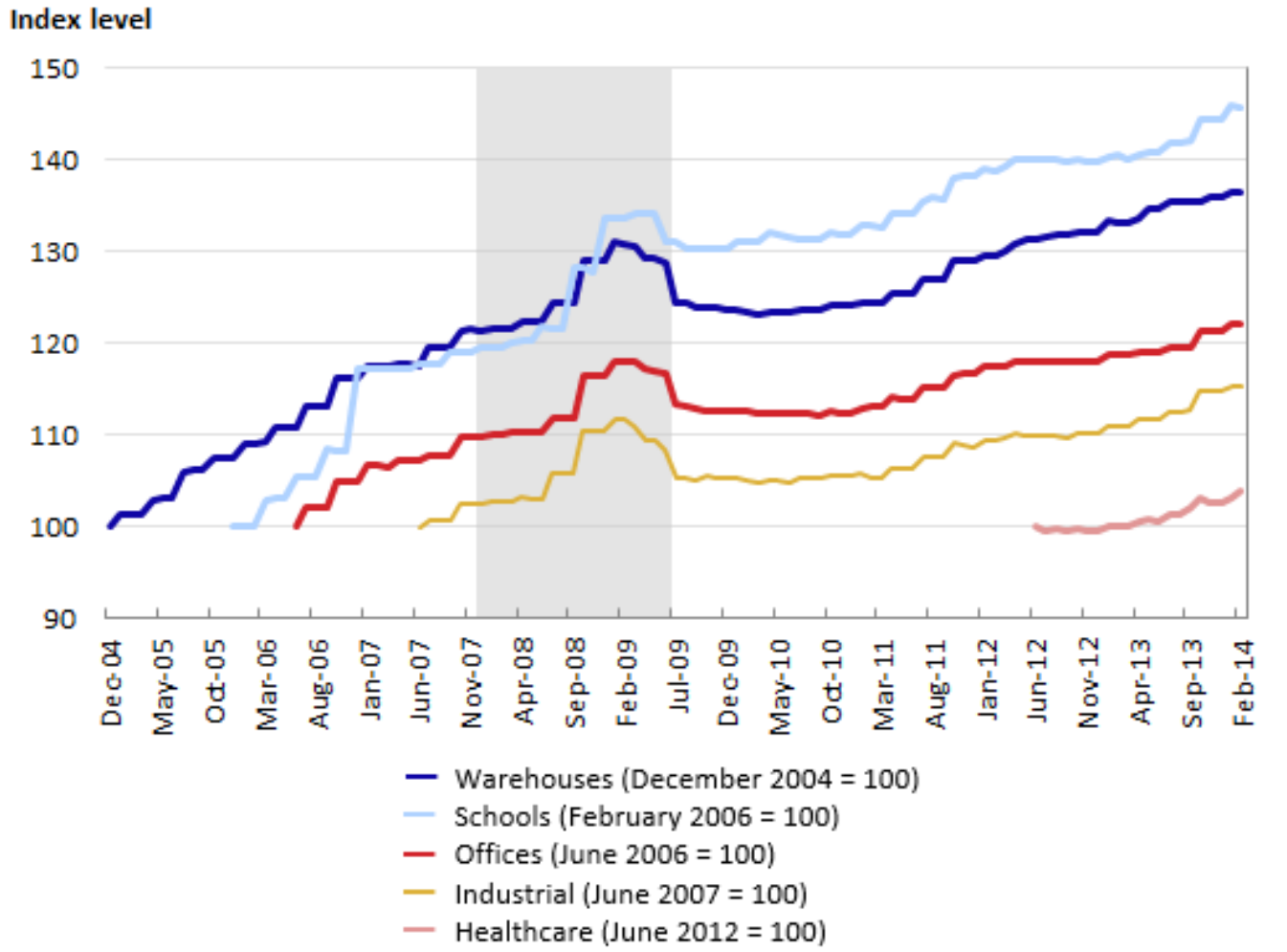
In 2004, the Bureau of Labor Statistics (BLS) unveiled the Producer Price Index (PPI) nonresidential building construction initiative with the publication of an index for new warehouse building construction. PPI has since added nonresidential building construction indexes for schools, offices, industrial buildings, and health care buildings. This construction sector initiative is noteworthy as it expanded coverage into an important sector of the U.S. economy not previously measured by the PPI, and allowed the examination of different drivers of building construction inflation. According to Bureau of Economic Analysis (BEA) data, in the first quarter of 2005, the value of private fixed investment in structures totaled $1.137 trillion, representing about 8.9 percent of total gross

domestic product (GDP). Of private fixed investment in structures, nonresidential structures alone represented $330.8 billion, or about 2.6 percent of total GDP. By the fourth quarter of 2013, nonresidential structures investments grew to $473.4 billion, or 2.8 percent of total GDP.[1]

Due to the complex and custom nature of construction, BLS employs a 'model'-based methodology that differs from most other PPIs. BLS, working with professional cost-estimating firms, reviews a list of recent construction projects for a particular type of structure and develops multiple nonresidential construction project models to accommodate regional variations in building design. The building models consist of a series of detailed component projects, material and labor costs, as well as quantity estimates for each job that are updated on a quarterly basis. As part of the monthly PPI survey, participating construction contractor firms, including general contractors and specialty trade contractors, are asked to review a sample of project descriptions and indicate the overhead and profit (OH&P) markup that their firm would apply to the given cost estimates to come up with a final bid price. These markups are added to the cost estimates to establish final output prices that are used in the calculation of the nonresidential building construction index.

Since 2004, when the first nonresidential building construction index was introduced, price movements within the nonresidential building construction sector have loosely paralleled the overall health of the U.S. economy, as shown in chart 1. Nonresidential building construction as a whole experienced a significant growth period from its introduction through early 2009. This period of rising prices was followed by a significant decline near the end of the Great Recession, (highlighted in chart), followed by a slow, but steady increase as the economy recovered. For example, beginning in December 2004, the new warehouse construction index increased 31.0 percent before peaking in January 2009. It then fell 6.0 percent to a postrecession low in March 2010, before recovering 10.8 percent through February 2014. Overall, it had a 3.9-percent average annual increase over this span of time. Although each index has a different base period, the indexes for school, office, and industrial building construction, showed similar growth patterns during and after the recession. The index for the construction of healthcare buildings, which began in 2012, exhibits the same steady growth.

**PPIs for new nonresidential building construction, December 2004–February 2014**



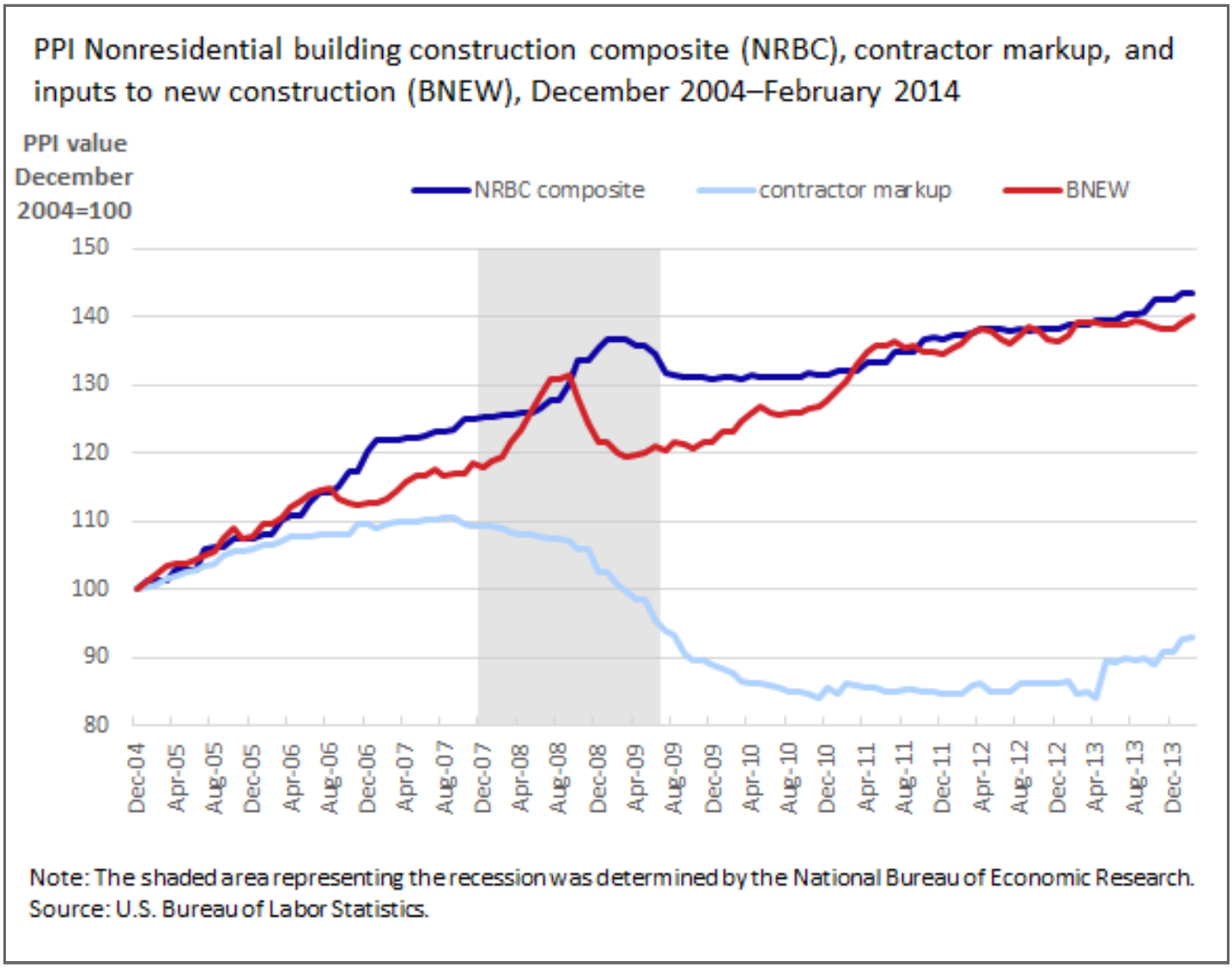

Note: The shaded area representing the recession was determined by the National Bureau of Economic Research.

Source: U.S. Bureau of Labor Statistics.

To gain a better understanding of the recent construction sector business cycle, BLS conducted an analysis of overhead and profit markup behavior. These data are of particular interest because they come directly from active contractors in the field, and the supply and demand of work is a key factor in any contractor's markup decision. A weak construction market will increase competition for the little work that is available, driving markups down, whereas a strong market will have the opposite effect. Therefore, a contractor's markup on a bid is an indicator of their perception of construction strength or weakness. For example, during the Great Recession, many contractors reported that the limited volume of available projects created an extremely competitive bidding environment. Some even indicated that they were bidding at cost in order to retain employees and avoid closing.

Access to such a large volume of overhead and profit markup data, as well as monthly phone contact with building contractors in the PPI survey, puts BLS in a unique position to analyze the important role this price component plays in determining final output prices. An aggregate, research index of the overhead and profit markup data was created to aid in this analysis.

Chart 2 shows three series from December 2004 to February 2014: the research-based, contractor overhead and profit markup index (markup); the published PPI for materials and supply inputs to new construction (BNEW); and a weighted average of the published NRBC indexes, called the NRBC composite.[2] All indexes are set equal to 100 in December 2004.




The markup index increased 10.4 percent from December 2004 through its August 2007 peak, before leveling off in the second half of 2007. During the Great Recession (from December 2007 to June 2009), the markup index declined 12.8 percent, falling below its initial December 2004 level. However, the construction sector was particularly hard hit, and the index continued to decrease through November 2010, dropping 23.7 percent from its August 2007 peak. The markup index struggled to recover, staying within 2.5 percent of the November 2010 low through May 2013. As of February 2014, the markup index remained 6.9 percent below its initial level and 15.7 percent below the August 2007 peak.

Much like the markup index, BNEW increased 16.7 percent from December 2004 to August 2007. However, despite the onset of the recession, BNEW continued to rise, peaking in September 2008 and gaining a total of 31.5 percent since December 2004. A rapid increase in new construction input prices from February to September 2008

was driven in part by rising prices for petroleum refinery products and fabricated structural metal. From September 2008 to March 2009, BNEW decreased 9.1 percent before turning up 14.1 percent through July 2011. From July 2011 through December 2013, the BNEW index inched up 1.4 percent.

Material input prices and contractor overhead and profit markups are two of the major drivers in building construction prices. It is therefore expected that the NRBC composite in chart 2 will reflect the aggregate behavior of the indexes for both BNEW and Markup. At the beginning of the Great Recession, BNEW increased, while markups decreased. The NRBC composite also increased during this period, although not as rapidly as BNEW, due to the downward effect of the Markup index. Coming out of the recession, the indexes for BNEW and Markup moved in opposite directions yet again. BNEW began to recover while Markup continued to fall, resulting in a moderating effect on NRBC composite, which remained relatively flat. As noted above, the Markup index did not level off until November 2010. It was at that time that we once again began to see a strong relationship between NRBC composite and BNEW, as input prices became the primary driver. Chart 2 shows that the markup index began to recover in late 2013 and a divergence began to form between the NRBC composite and BNEW. This behavior is expected because markups are now playing a more active role as a price driver in the construction sector.

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## RELATED ARTICLES

More BLS articles related to the construction industry are available online at the following links:

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## NOTES

[1] Table 1.1.5 (Gross Domestic Product) and Table 5.3.5 (Private Fixed Investment by Type) (Bureau of Economic Analysis, U.S. Department of Commerce, March 27, 2014), https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey

[2] The NRBC composite index is a weighted average of PPI industry data for NAICS 236211, NAICS 236221, NAICS 236222, NAICS 236223, and NAICS 236224

## SUGGESTED CITATION

Justin M. Harper, “Examining trends in the nonresidential building construction producer price indexes (PPIs),” *Beyond the Numbers: Prices and Spending*, vol. 3, no. 10 (U.S. Bureau of Labor Statistics, May 2014), https://www.bls.gov/opub/btn/volume-3/examining-trends-in-the-nonresidential-building-construction-producer-price-indexes-ppis.htm