

# Chicago Fed Letter

## Does the housing slump account for the slowdown in productivity growth?

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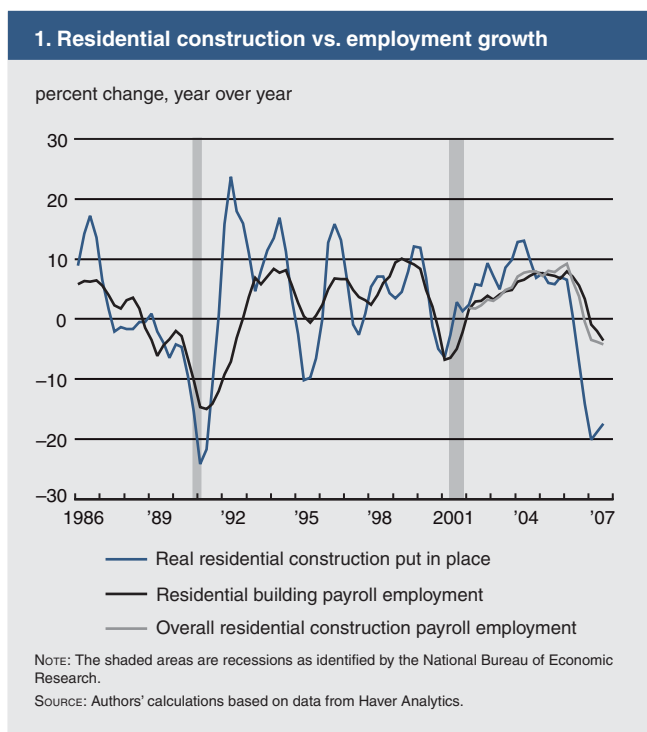
The authors explore the entire construction sector, as well as the different classes of workers employed by it, to see how much it may be contributing to the recent slowdown in productivity growth.

In recent years productivity growth has slowed significantly. Although nonfarm productivity picked up sharply in the

third quarter of 2007, during the prior two years productivity grew by only 1.1% at an average annualized rate, compared with an average growth rate of 2.8% from the end of 1995 to the end of 2004. Because labor productivity growth is a key driver of living standards, there is considerable interest in knowing whether the recent decline is merely a temporary lull or the beginning of a more prolonged period of slower growth like that experienced from about 1973 until

that the slowing of productivity is primarily cyclical. Housing starts have fallen dramatically since their peak in the first quarter of 2006, while residential construction employment is down by much less. This suggests a significant drop in the housing sector's level of productivity (output per hour), and some have argued that this accounts for a large portion of the economy-wide decline in productivity.<sup>1</sup> If this were the case, it would bolster the argument that the current overall slowdown is largely cyclical.

In this *Chicago Fed Letter*, we examine how much of the slowdown in productivity growth may be attributed to a decline in productivity in the construction sector. Unlike some previous analyses, we look at the *entire* construction sector rather than simply the residential portion. This is mainly because some businesses that are classified as being in the residential construction sector may also serve the commercial or government sectors in which building has continued to grow at a healthy pace. In this case, simple calculations that only use the residential sector would tend to overstate the actual decline in construction productivity growth. We also take into account trends among self-employed and undocumented construction workers using household-level micro data from the U.S. Census Bureau's *Current Population Survey* (CPS).



1995. Unfortunately, answering this question is difficult because productivity growth fluctuates considerably from year to year and often slows when the economy cools, as it has recently.

The recent sharp slowdown in the home-building sector could support the notion

## 2. Total construction vs. total construction employment growth



NOTE: The shaded areas are recessions as identified by the National Bureau of Economic Research.  
SOURCE: Authors' calculations based on data from Haver Analytics.

## 3. Construction employment: Payroll vs. self-employed



NOTES: The shaded areas are recessions as identified by the National Bureau of Economic Research. There are abrupt adjustments to the individual-level weights in the *Current Population Survey* based on changes in the U.S. Census Bureau's population estimates. In order to avoid attributing these jumps to actual employment changes, we smooth the weight changes (by race/ethnicity groups) over the period since the last change for the self-employed.  
SOURCES: Authors' calculations based on data from Haver Analytics and the U.S. Census Bureau, *Current Population Survey*.

If, for example, the number of self-employed workers in construction has been declining, then simple calculations using only the employment data from the U.S. Bureau of Labor Statistics, Current Employment Statistics program's payroll survey will overstate the decline in productivity, since self-employed

workers are not captured by this survey.

We conclude that, while construction productivity has fallen significantly in recent quarters, this decline only explains a portion of the overall productivity slowdown.

### Residential construction

Figure 1 highlights the recent deviation between output growth and employment growth in the residential construction sector. Using the U.S. Census Bureau's series on residential construction put in place, we find that real output dropped 17.5% over the last year.<sup>2</sup> To measure employment, we combine data on building employment and trade employment in the residential sector, which are available since 2000.<sup>3</sup> By this measure residential construction employment has only declined about 4.2% relative to a year ago. Although data on employment in the residential trades are not available before 2000, data on the residential portion of the building category are available back to 1986—as shown in figure 1.<sup>4</sup> The two em-

ployment series match up reasonably well in the post-2000 period, suggesting that residential building employment may be a reasonable proxy in earlier years as well.

Although we only have data on two recessionary periods, figure 1 shows that the recent divergence between output growth

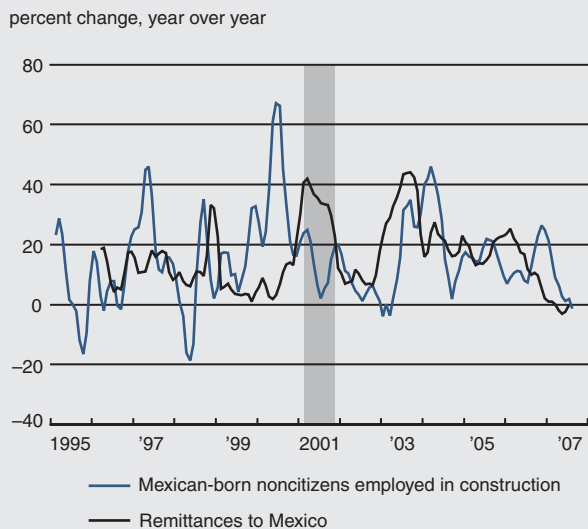
and employment growth is unusually large. A crude measure of productivity growth would simply take the difference between output growth and employment growth, suggesting a 13% decline over the past year. However, there are three sources of error in such a calculation. First, output should ideally be measured as value added, rather than gross output. However, since value-added measures are not available on a timely basis, we use gross output measures of construction. Though we know of no evidence that the industry's use of inputs has declined at a different rate than its use of outputs, this is a potential source of bias. Second, it is possible that some establishments that are classified as residential builders also do some nonresidential work—an issue that we deal with by analyzing the full construction sector. Finally, to measure labor input, ideally we should use total hours worked rather than the number of employees—an issue we address by incorporating data on hours worked per week.

### Overall construction

If residential construction plays a major role in the aggregate decline in productivity, total construction also should reflect this decline. However, by using the entire construction sector, we avoid mismeasurement associated with residential establishments that do work outside of that sector. A second advantage is that there is more historical data on employment in total construction. This allows us to better assess how unusual current developments actually are.

Figure 2 shows that, although output and employment in the overall construction sector have historically moved together, there is a noticeable gap in the growth rates in the most recent period. This gap, while larger than normal, is not historically unprecedented. Output is down 5.1% from a year ago, while construction employment is down only 1.1%. The current gap is similar to the ones observed in the 1980, 1982, and 1991 recessions. It is notable that the latter two periods were followed by periods in which construction output gains were much stronger than those for construction employment. The simple gap between total construction employment and output growth implies

#### 4. Employment of Mexican-born noncitizens and remittances



NOTES: The shaded area is a recession as identified by the National Bureau of Economic Research. The figure shows two smoothed (three-month moving) averages of yearly growth. SOURCES: Authors' calculations based on data from the Bank of Mexico and the U.S. Census Bureau, *Current Population Survey*.

#### 5. Total productivity: Actual vs. net of construction productivity



NOTE: The shaded area is a recession as identified by the National Bureau of Economic Research. SOURCE: Authors' calculations based on data from Haver Analytics.

a more modest 4% drop in construction productivity compared with the 13% drop in the residential construction productivity implied by figure 1. The fact that the decline in productivity growth for the overall construction sector is only a fraction of the decline in the residential sector is consistent with the notion that some establishments categorized in the residential sector actually do

work in the nonresidential sector.<sup>5</sup> Figure 3 includes the resulting estimates of total self-employed construction employment. The pattern of self-employment growth in construction differs somewhat from that of construction employees in the payroll survey. It was especially rapid in 2003 and 2004, and slowed earlier than payroll employment (in 2005 rather than 2006). In 2007, however, self-employment in construction is little

changed over the previous year, similar to payroll employment.

#### Measuring hours and the self-employed

We further refine the productivity calculation described previously to better measure labor input by including growth in hours worked in construction. Data on production and non-supervisory workers from the payroll survey show that hours worked among these workers has been virtually identical to employment growth. However, this still misses the hours of supervisory and self-employed workers. To approximate the hours of supervisory workers, we follow a procedure used by the U.S. Bureau of Labor Statistics, but again find no real difference between job growth and hours growth when we include the hours of these workers.<sup>6</sup>

In order to measure the number of self-employed workers and their hours, we use the monthly CPS files from January 1976 through September 2007.

#### Undocumented workers

Some analysts have noted that there has been an especially sharp decline in remittances to Mexico that has coincided with the downturn in residential housing construction in 2006. Since a large share of construction employment is among Mexican-born workers, this has led to speculation that many undocumented workers from Mexico may have been laid off as a result of the housing downturn, but that the decline was not reflected in the payroll employment figures because of underreporting. To address this, we use the CPS to construct a time series of the number of Mexican-born noncitizens that report working in the construction sector. This serves as a reasonable proxy for undocumented construction workers.<sup>7</sup>

Figure 4 plots the three-month moving average of yearly growth in remittances to Mexico and the same measure for construction employment among Mexican-born noncitizens. In some periods it appears that growth in employment precedes growth in remittances, but the pattern is clearly not consistent. The growth

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*Chicago Fed Letter* is published monthly by the Research Department of the Federal Reserve Bank of Chicago. The views expressed are the authors' and are not necessarily those of the Federal Reserve Bank of Chicago or the Federal Reserve System.

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in remittances has slowed sharply from 25% in March 2006 to 0% in August 2007. Over that same period, employment among Mexican-born noncitizens accelerated sharply at the end of 2006, reaching a peak growth rate of 26% before beginning to decelerate in 2007. Overall, however, employment in this group is only slightly lower than it was a year ago. Therefore, we are not convinced that changes in the employment patterns of undocumented workers explain the overall stability of construction employment.

### Productivity net of construction

Lastly, figure 5 shows growth in non-farm business productivity alongside a measure of productivity that excludes

construction.<sup>8</sup> Productivity growth appears to be about two-tenths of a percentage point stronger when we exclude construction. Nevertheless, productivity growth still looks slower than it did a few years ago. This suggests that the decline in productivity should not be viewed as a largely temporary phenomenon driven by the housing slowdown. While construction is partially responsible for the deceleration in productivity, it can only explain a portion of the entire decrease, therefore making it hard to predict whether the slowdown will be prolonged.

### Conclusion

Our results suggest that some construction establishments classified in

the residential sector may be doing an increasing amount of work for commercial and government clients. We also find that, while there are large numbers of self-employed workers in the construction industry, an accounting for self-employment does not have a major impact on productivity estimates. Finally, we are skeptical of the claim that unmeasured changes in the employment of undocumented workers have played a major role in recent developments. However, there is still some uncertainty about our conclusions given the remaining data limitations.

<sup>1</sup> See, for example, Goldman Sachs, 2007, "Slower productivity growth? Not so fast!," *U.S. Economic Analyst*, No. 07/16, April 20. This report maintained that productivity growth outside of residential investment was "solid" and concluded that the productivity slowdown was cyclical.

<sup>2</sup> The series is deflated by the U.S. Bureau of Economic Analysis's price index for private residential investment. We would reach similar conclusions if we had used housing starts, completions, or residential investment.

<sup>3</sup> Since 2000, the U.S. Bureau of Labor Statistics has classified establishments in these subsectors into separate residential and nonresidential categories by their major activity. A third subsector—heavy and civil engineering—is not divided into residential and nonresidential components.

<sup>4</sup> Residential building employment is about one-third of total residential construction employment.

<sup>5</sup> It is also possible that the crude estimate for residential construction productivity is accurate, but is offset to some extent by above-average productivity growth in the nonresidential sector.

<sup>6</sup> Hours worked per week by supervisors are taken as a constant ratio of hours per week worked by nonsupervisors. These yearly ratios are provided by the U.S. Bureau of Labor Statistics through 2006 (2006 values assumed for 2007).

<sup>7</sup> See Pia M. Orrenius and Madeline Zavodny, 2006, "Did 9/11 worsen the job prospects of Hispanic immigrants?," Federal Reserve

Bank of Dallas, working paper, No. 0508, revised January 2006, available at [www.dallasfed.org/research/papers/2005/wp0508.pdf](http://www.dallasfed.org/research/papers/2005/wp0508.pdf). The authors cite several studies that suggest that the CPS, which uses physical addresses for a sampling frame, actually captures the vast majority of undocumented workers and that the response rate may be as high as 90%. We also compared the counts of Mexican-born noncitizens working in construction in the CPS with analogous counts derived from the 2000 U.S. Census and the 2005 *American Community Survey*, and found very similar results.

<sup>8</sup> To calculate the share of construction in the total economy, we took the ratio of value added in construction to value added in the private economy in 2006.