

# A Brief Overview of Production and Costs in the Construction Industry

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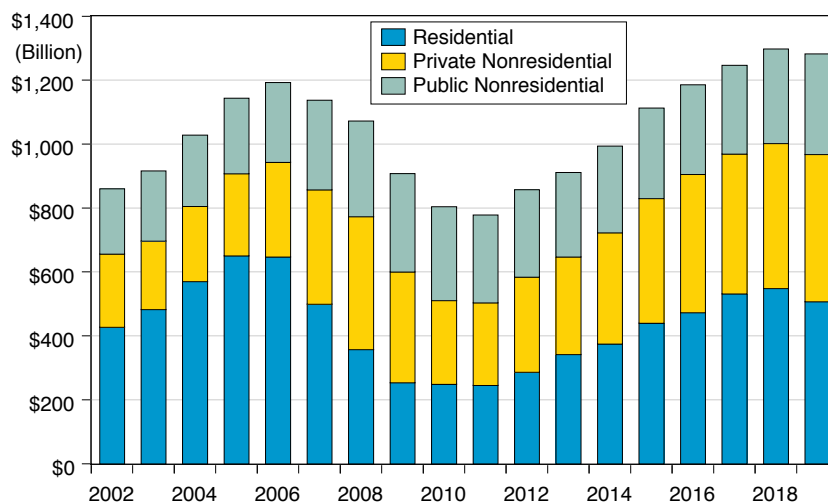
This report provides three things: (1) A brief overview of the construction industry in recent years. (2) A simple analysis of 2018 steel tariffs, steel prices, and their impact on construction costs. (3) A quick look at the construction worker wages over time and across the country.

In recent quarters, construction activities in the U.S. have been slowing. For example, residential investment was a drag on GDP growth in 2018 and 2019Q1. Figure 1 shows the nominal spending<sup>1</sup> of construction by three major sectors: residential, private nonresidential, and public residential investments. Figure 2 displays the real annual growth rates of these three construction investments.<sup>2</sup> Indeed, real residential

activities had negative growth in 2018 (-2.3%) and 2019Q1 (annualized at -9.3%) while private nonresidential growth was small in 2017 (0.7%) and 2018 (2.4%).

Figure 3 presents the nominal spending of major subsectors in private nonresidential construction. The largest sector is the power sector, including electric, oil, and gas facilities, due mostly to the fracking boom. The second largest is the commercial sector, which includes retail, restaurants, auto dealers, and warehouses. The third largest sector is manufacturing, followed closely by the office sector, and health care (e.g. hospital and nursing homes) and lodging.

Figure 1 Nominal Construction Spending in the U.S., 2002 to 2018, and 2019Q1



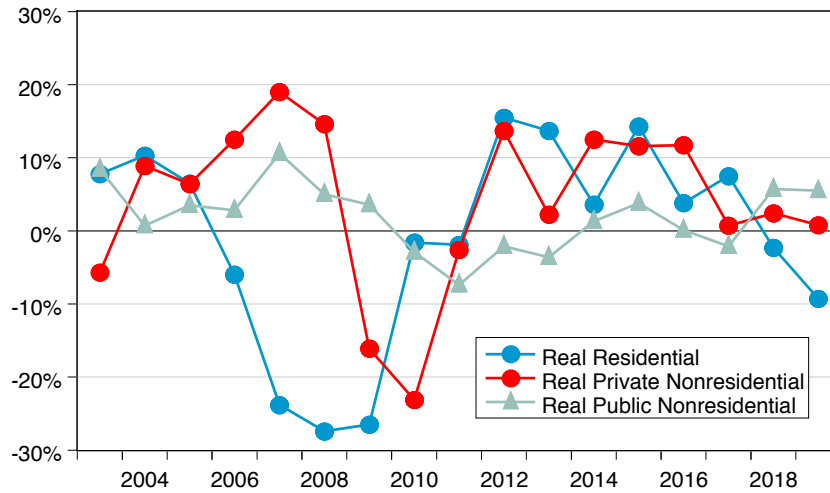
Source: U.S. Census Value of Construction Put in Place

*The spending includes cost of materials installed, cost of labor, cost of equipment rental, contractor's profit, cost of architectural and engineering work, interest and taxes paid during construction and overhead and office costs.*

*The nominal construction spending has been adjusted by chain price index for residential and nonresidential investment.*

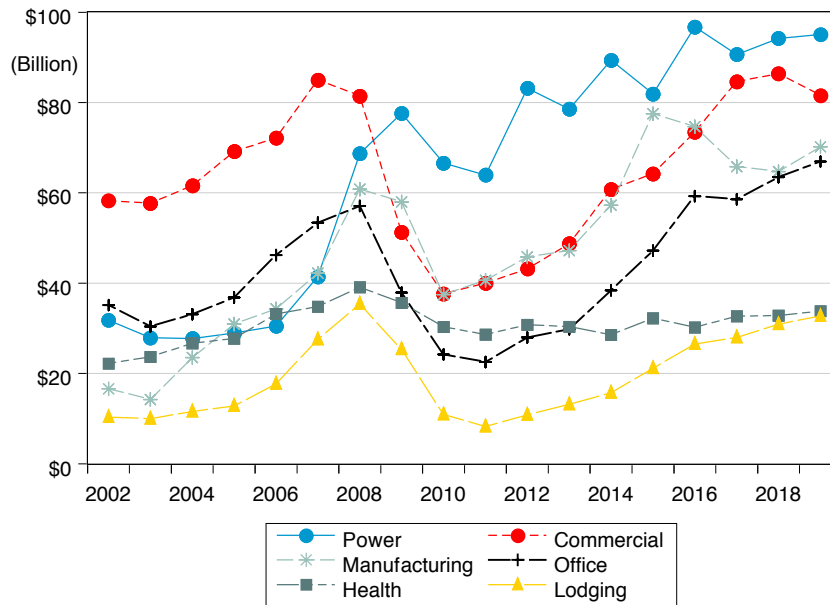
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Figure 2 Real Growth Rates of U.S. Construction Investment, 2002-2018, 2019Q1



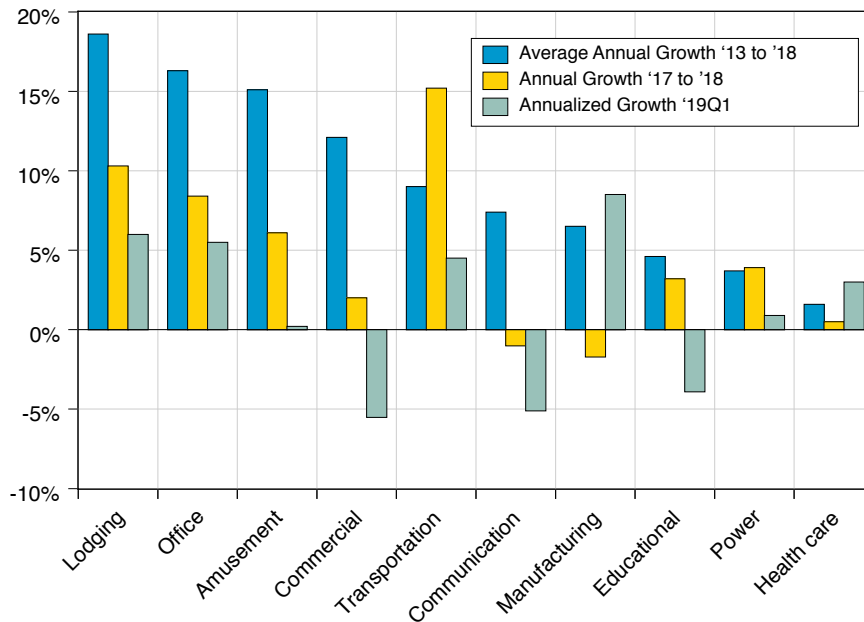
Source: U.S. Census Value of Construction Put in Place

Figure 3. Nominal Spending of Subsectors in Private Nonresidential Construction



Source: U.S. Census Value of Construction Put in Place

Figure 4 Annual Growth Rates of Nominal Spending of Subsectors in Private Nonresidential Construction



Source: U.S. Census Value of Construction Put in Place

Figure 4 exhibits the nominal annual growth of the subsectors of main private nonresidential construction in the past five years, one year, and first quarter of 2019. Lodging and office construction were doing well while commercial and communication were weak. Manufacturing seems to be surging in 2019Q1. Commercial construction declined at the annual rate of 5.5% in 2019Q1. The reason might be likely that the rise of e-commerce leads to the reduction of the demand for physical retail stores.

### Steel Tariffs and Impact on Construction Cost

Since steel products are a necessary input of various non-residential construction, it is important to know how the steel imports tariffs to most foreign countries imposed by the U.S. government in March 2018 impact the steel price and therefore the material cost in construction. Figure 5 shows the import price index and producer price index for steel since 2000. Both indices were moving by and large in tandem. We do see steel import and production prices rising after the tariff imposed in early 2018. As a global commodity, steel has the most volatile price dynamics compared to other inputs, such as timber, sand, gravel, and machinery, for construction. Note that steel prices had already been ris-

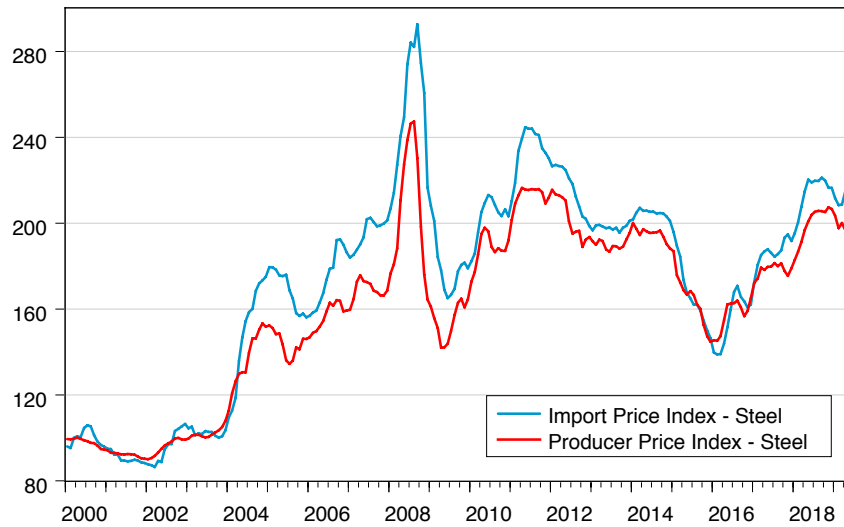
ing since 2016. More importantly, it is puzzling to see steel prices have dropped since August 2018, just months after the implementation of steel tariffs.

Figure 6 shows the year-over-year growth rates of import and producer prices of steel and the producer price index for construction inputs of goods. Since steel is only one component of the cost of construction goods, the overall construction cost moved less dramatically than the commodity prices. Still, the construction cost of goods inputs fluctuated, by and large, in the same direction with steel prices: rising in 2017 and 2018Q1 to Q3 but slowing down quickly in 2018Q4 and 2019Q1.

Why is that? Two possible explanations might be part of the reasons. First, as shown in Figure 2, there is a slowdown of construction activities, in particular for residential construction in the U.S. As a result, the recent weaker demand reduced the price and cost. Second, as shown in Figure 7, the U.S. industrial production index of construction steel has surged since mid 2018. Ample domestic production and supply might drive down the market price of steel and thus drive down construction cost.

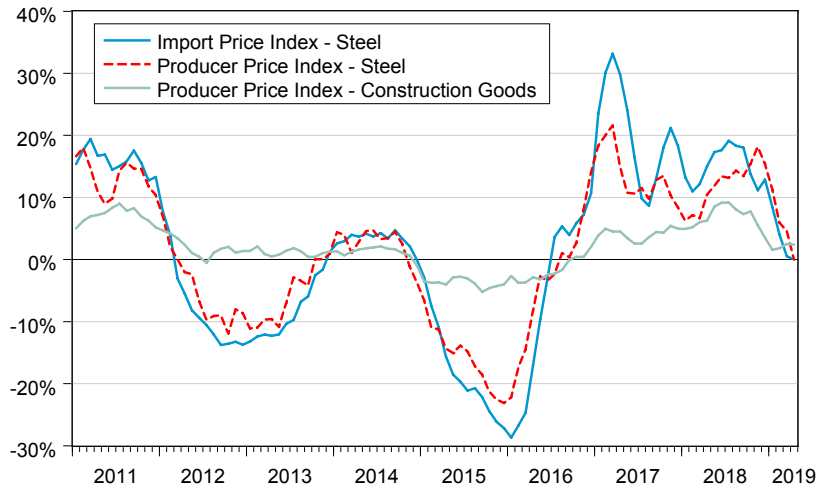
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Figure 5 Import Price Index and Producer Price Index of Steel



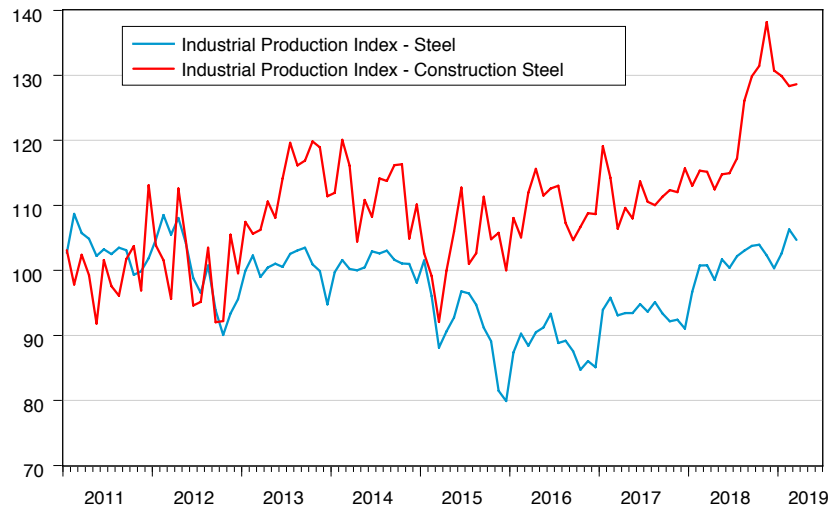
Source: Bureau of Labor Statistics

Figure 6 Year-Over-year Growth Rate of Steel Prices and Construction Goods Cost



Source: Bureau of Labor Statistics

Figure 7 Industrial Production Index for Steel and Construction Steel



Source: Bureau of Labor Statistics

### Labor Costs in the Construction Industry

Besides goods materials—such as steel, lumber, sand, and gravel—labor cost is another big part of the total construction cost. Figure 8 depicts the year-over-year growth rate of nominal hourly earnings in the total private industry and the construction industry. While construction workers had a lower growth rate than the overall private industry after the Great Recession, they enjoyed slightly higher wage growth since 2014 with the heat-up of construction activities. That might also reflect the situation that there has been a tight labor market supply in construction since 2014. Lately, the annual wage growth is around 3% and 3.5%.

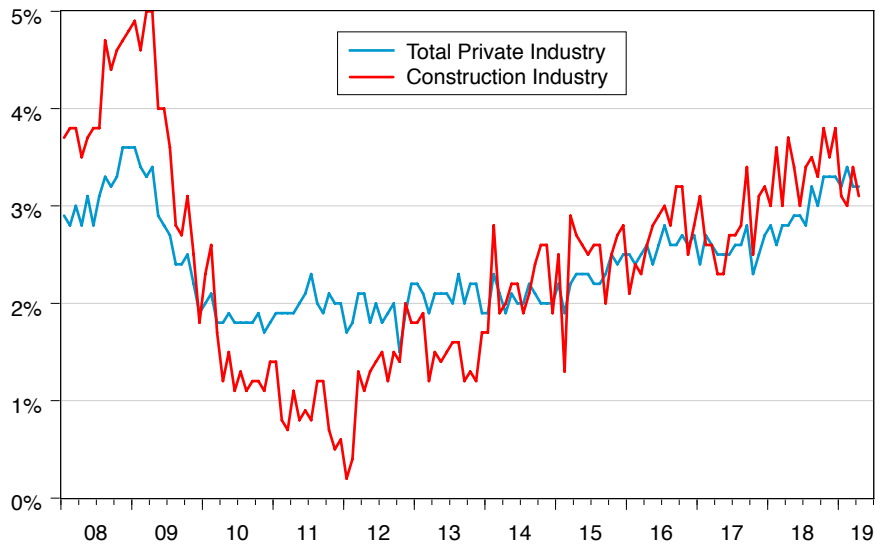
Figure 9 lists the wage distributions based on skills of construction workers across 15 major metros in 2018 in the U.S. While the wages of low-skill construction workers (10th percentile) do not vary much across the nation (from \$25,000 to \$37,000), median-skill and high-skill (90th per-

centile) workers differ a lot in terms of wages. For instance, median wage is \$38,700 in Miami but \$75,500 in Chicago. High wage is \$64,000 in Dallas but \$117,000 in New York. Some of the reasons might be the supply and demand of labor as well as the disparity of cost of living among cities.

If we assume that the construction labor cost is a fixed percentage across the country, we can use the total payroll of construction workers to compare construction market size, residential, private or public nonresidential, for these 15 metros as shown in Figure 10. The largest market is New York metro with \$22 billion, followed distantly by Los Angeles with \$11.5 billion, Chicago’s \$9.8 billion, Houston’s \$8.7 billion, San Francisco’s \$6.7 billion, Dallas’s \$6.4 billion, Boston’s \$6.2 billion, Seattle’s \$6 billion, and Washington DC’s \$5.8 billion.

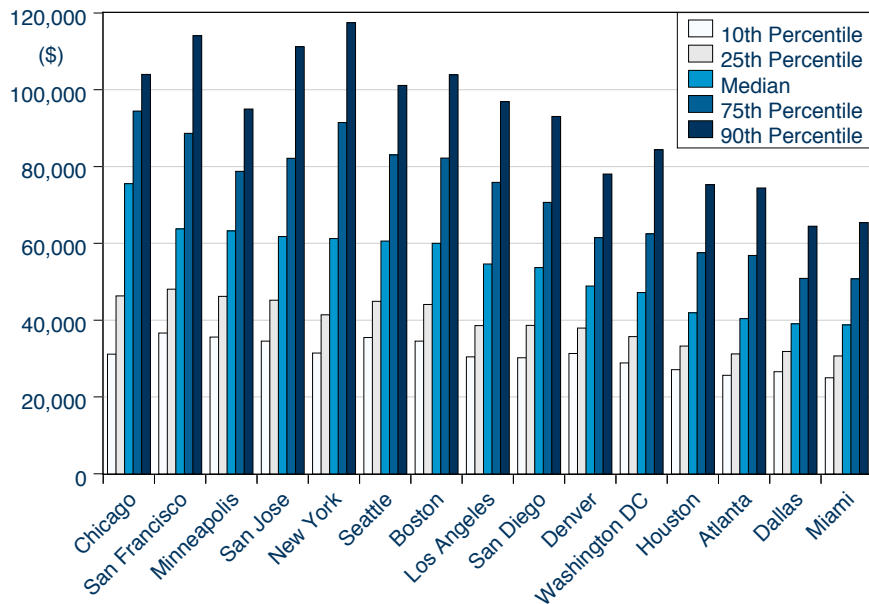
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Figure 8 Year-over-year Growth Rate of Average Hourly Earnings



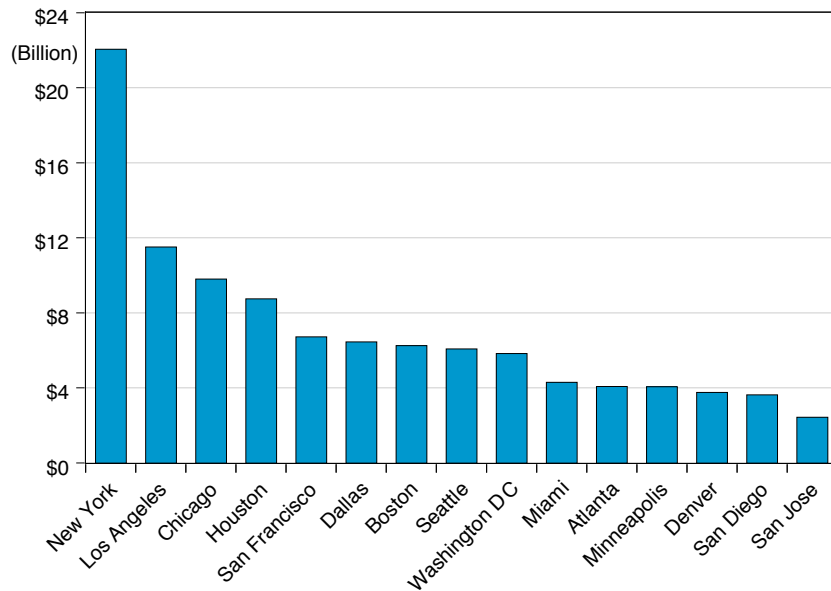
Source: Bureau of Labor Statistics

Figure 9 Distribution of Annual Wage of Construction Workers Among 15 Major Metros, 2018



Source: Occupational Employment Statistics

Figure 10 Total Payroll of Construction Workers for 15 Major Metros, 2018



Source: Occupational Employment Statistics

## Conclusions

The takeaways of the report are as follows:

- There is a slowdown of construction activities, in particular for residential construction, in recent quarters. As a result, growth rates of input price and cost of construction also cool down. The steel tariff imposed in March 2018 caused a temporary increase of steel prices.
- Annual wage growth for construction workers remains 3% plus in recent years, which is slightly higher than the overall industry average. That might reflect a tight labor supply in construction since 2014. Construction wages differ widely across the country.
- In private nonresidential construction, the power sector, including oil, gas, and electricity facilities, has the largest investment over the past few years. That echoes the fact that the U.S. is the largest oil producer in the world and its exports increase rapidly in recent quarters.
- In terms of total construction worker payroll, New York metro is the largest construction market, distantly followed by Los Angeles and Chicago.