

The Pay Premium for Manufacturing Workers as Measured by Federal Statistics

Executive Summary

Historically, manufacturing jobs have offered relatively high pay. However, there is not a consensus on the size of the pay premium for manufacturing jobs relative to the economy as a whole or even whether a premium continues to exist. This report turns to evidence to answer those questions, using ten federal datasets, each of which allows us to calculate and compare the average pay of manufacturing workers and the average pay of workers overall. The following datasets are included:

- American Community Survey
- County Business Patterns
- Current Employment Statistics
- Current Population Survey
- Economic Census
- Employer Costs for Employee Compensation
- National Income and Product Accounts
- Occupational Employment Statistics
- Quarterly Census of Employment and Wages
- Quarterly Workforce Indicators

In addition, these datasets allow us to examine comparisons of average pay that control for various factors that could affect the estimated pay premium, such as whether the data measures pay on an hourly basis or for some other period, and which workers are included in the pay premium estimate. Generally, we find evidence of a pay premium regardless of which dataset we examine. However, the size of the premium is increased or decreased by various factors.

Key findings from the analysis include:

- Based on hourly wages and salaries, manufacturing workers earn more on average than the overall average worker: using data for 2013, estimates of

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the hourly pay premium vary from 2 to 9 percent, depending on the dataset used.

- When hours worked in a week or over the course of a year are taken into consideration, the estimated premium increases. Estimated premiums using weekly or annual pay data are as high as 32 percent. This larger premium is because manufacturing employees work longer hours per week and more hours per year on average.
- Because the manufacturing sector has a high proportion of full-time workers relative to other private sector industries, the pay premium is smaller when the estimates are restricted to full-time workers, in one case declining from 32 percent for all workers to 12 percent for full-time employees.
- Data that distinguishes new hires from all workers finds that both groups enjoy a pay premium in the manufacturing sector, with new hires earning a larger premium than other workers.
- The size of the premium also varies greatly depending on the occupation. For some occupations, manufacturing workers earn less than workers overall. At the other extreme, manufacturing workers in sales occupations earn 64 percent more than their counterparts in non-manufacturing sales occupations throughout the economy.
- Estimates of a manufacturing pay premium should use the dataset and comparison groups that best suits the particular question at hand. Datasets providing estimates of hourly pay might be more appropriate for estimating a premium based solely on wages, but datasets providing estimates of weekly, monthly or annual pay might provide greater insights about worker incomes.
- Additional research is needed to better understand the underlying factors that drive the manufacturing premium. The heterogeneity of the manufacturing sector and its workforce suggests that both worker characteristics, such as occupational and educational attainment, and employer characteristics, such as firm size and age and specific industry, could play a role in the premium. Regression analyses that control for such factors can help identify their importance in the overall premium.

Introduction

Historically, manufacturing jobs have offered relatively high pay, good benefits and a certain job security for workers in that sector.¹

However, as the economy changed, the manufacturing sector shed millions of jobs, especially in the 1990s, and the manufacturing sector's reputation for offering higher paying jobs has been called into question.

Much of the existing evidence suggests that there is some pay premium for manufacturing jobs, although there is no consensus estimate of the size of the premium. For example, [previous work](#) by the Economics and Statistics Administration's Office of the Chief Economist (OCE) found that, in 2010, manufacturing workers earned a 17 percent compensation premium over those not working in manufacturing,² and [OCE recently reported](#) that, in 2012, new hires in manufacturing earned a substantial 38 percent more than new hires in other sectors.³

Other researchers have also estimated whether there is a manufacturing pay premium. The Economic Policy Institute found that, on average for 2012 to 2013, non-college educated workers in manufacturing made 10.9 percent more than similar workers in the rest of the economy.⁴ On the other hand, research by the

National Employment Law Project (NELP) found that certain manufacturing workers earned 7.7 percent less than their public- and private-sector counterparts.⁵ A recent Bloomberg View piece also pointed to lower earnings of production and non-supervisory workers in the durable-goods manufacturing sector, compared to all workers in the private sector.⁶

One possible explanation for this wide range of estimates of the manufacturing pay premium is that many of these studies use different datasets and different comparison groups as the basis for the calculations. Below we test this explanation by reviewing evidence of a pay premium in 2013 from ten official federal government data series.⁷ These data series are:

- American Community Survey
- County Business Patterns
- Current Employment Statistics
- Current Population Survey
- Economic Census

<http://www.epi.org/publication/the-manufacturing-footprint-and-the-importance-of-u-s-manufacturing-jobs/>.

⁵ Ruckelshaus, Catherine, and Sarah Leberstein, "Manufacturing Low Pay: Declining Wages in the Jobs that Built America's Middle Class," National Employment Law Project, November 2014, available at: <http://www.nelp.org/content/uploads/2015/03/Manufacturing-Low-Pay-Declining-Wages-Jobs-Built-Middle-Class.pdf>.

⁶ Fox, Justin, "Farewell to the Blue-Collar Elite," Bloomberg View, April 6, 2015, available at: <http://www.bloombergview.com/articles/2015-04-06/factory-worker-wages-are-nothing-special-these-days>.

Durable goods manufacturing accounted for 62 percent of all production and nonsupervisory employment in manufacturing in May 2015 according to the Current Employment Statistics survey. Nondurable goods manufacturing accounted for the remaining 38 percent.

⁷ In this report, "pay" is a general term that refers to the monetary compensation paid to or received by employees for work performed. Depending on the data source, "pay" can refer to wages, an hourly rate as stated by the employer; earnings, the actual cash compensation received over a given time period; or payroll expenditures for wages and salaries.

¹ Langdon, David, and Rebecca Lehrman, "The Benefits of Manufacturing Jobs," U.S. Department of Commerce, Economics and Statistics Administration, May 2012, available at: <http://esa.doc.gov/sites/default/files/1thebenefitsofmanufacturingjobsfinal5912.pdf>.

² Langdon and Lehrman (2012).

³ Powers, Regina, and Ryan Noonan, "Earnings of New Hires in Manufacturing: Wage Benefits Continue," U.S. Department of Commerce, Economics and Statistics Administration, February 2014, available at: <http://esa.doc.gov/economic-briefings/earnings-new-hires-manufacturing-wage-benefits-continue>.

⁴ Scott, Robert E., "The Manufacturing Footprint and the Importance of U.S. Manufacturing Jobs," Economic Policy Institute, January 2015, available at:

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- Employer Costs for Employee Compensation
 - National Income and Product Accounts
 - Occupational Employment Statistics
 - Quarterly Census of Employment and Wages
 - Quarterly Workforce Indicators

It is important to note that these data sources have several methodological differences, including how pay is defined, whether the survey unit is a household or business establishment, how long the reference period is (that is, the period of time the statistics are measuring), and what types of employees are covered.⁸ These methodological differences may help explain why there is a range of estimates of the manufacturing pay premium.⁹

Other methodological issues that can lead to different estimates of the premium include the fact that most of the datasets rely on sample surveys with corresponding sampling errors.¹⁰ In other words, average pay is an estimate that approximates a true value; these sample-based estimates lie in a confidence interval around the true value the survey is trying to measure.¹¹ Second, the sources of pay

⁸ Appendix 1 provides detail on the definitions and methodology for each dataset, as well as how industries and class of worker are identified. Appendix 2 discusses differences in employee coverage of the estimates.

⁹ We do not provide an explanation as to why the premium exists, nor does this report attempt to pick the best dataset for measuring the premium. However, as discussed below, we do offer areas for future research that might help explain why a manufacturing pay premium exists and how to put the size of the premium in context.

¹⁰ Three datasets are not from sample-based surveys; the Economic Census, County Business Patterns, and the Quarterly Census of Employment and Wages provide data from full counts of establishments.

¹¹ A confidence interval expresses the amount of uncertainty associated with a statistic drawn from a sample. For example, suppose we might estimate, based on survey data, that 10.0 to 12.0 percent of a city's population had a certain characteristic. We might then use a confidence level to describe the uncertainty associated with the estimate of the interval of 10.0 to 12.0 percent.

data for the datasets can differ. Most of the datasets use information from employers' business payroll records, but others, namely the Current Population Survey (CPS) and the American Community Survey (ACS), collect information from individuals (or households). To the extent that individuals rely on recall, they may report their earnings with less accuracy than that of official employer records. Furthermore, in some cases the household surveys request information about "usual pay" rather than actual pay, which could make the estimates even less precise. In addition, these data sources can have different methods of editing and correcting data and handling nonresponse. Finally, as discussed in Box 1, definitions of pay differ across data sources.

However, in our discussion below, we focus on a few crucial aspects that help explain the difference in pay premium estimates across the various datasets. One key difference is the time period over which the pay premium is calculated; looking at hourly wages versus weekly or annual data generally results in a lower estimate of the pay premium. In addition, limiting the analysis to full-time employees or new hires also leads to a different picture of the size of the pay premium: limiting the estimates to full-time employees decreases the size of the premium, while examining only new hires leads to a higher estimate of the pay premium.

This estimate might be described as a "95% confidence interval" which indicates that if we used the same sampling method to construct multiple samples and an interval estimate was computed for each sample, the true population parameter would fall within the interval estimates 95% of the time. See Stat Trek for a full definition of confidence intervals: http://stattrek.com/statistics/dictionary.aspx?definition=confidence_interval.

Box 1. Defining Pay

One possible reason that pay premium estimates differ is that the definition of “pay” differs by data source; earnings data from one source may include different components of pay than earnings data from another. Table B-1 lists some common components of pay and indicates which components are included in each dataset that provides hourly estimates of pay.^A The table lists the datasets from the narrowest measure of pay to the broadest. For example, hourly earnings data from the Current Population Survey (CPS) and the Employer Costs for Employee Compensation (ECEC) datasets include only the basic wage rates that a worker earns for an hour of work while hourly pay data from the National Income and Product Accounts (NIPA) includes the payments for basic wages as well as overtime pay, pay for leave, regular bonuses, and other components of pay.^B

Table B-1. Components of Hourly Pay for Datasets with Hourly Pay

| | Current Population Survey[1] | Employer Costs for Employee Compensation | Occupational Employment Statistics | Current Employment Survey | National Income and Product Accounts |
|--|------------------------------|--|------------------------------------|---------------------------|--------------------------------------|
| Base wage/salary rate | ✓ | ✓ | ✓ | ✓ | ✓ |
| Supplemental pay | | [2] | | | |
| Overtime pay | | | | ✓ | ✓ |
| Pay for leave (sick, vacation, personal) | | | ✓ | ✓ | ✓ |
| Regular bonuses | | | ✓ | ✓ | ✓ |
| Irregular bonuses | | | | | ✓ |
| Pay in kind | | | | | ✓ |
| Commissions/tips | | | ✓ | ✓ | ✓ |
| Shift differentials | | | | ✓ | ✓ |

Note: [1] Hourly earnings data from the Current Population Survey only covers workers who are paid on an hourly basis, which accounts for approximately 3/5 of all wage and salary workers.

[2] In ECEC, supplemental pay is considered a benefit, not a component of wages or salaries. Supplemental pay does not include paid leave, which is considered a separate benefit.

Source: Department of Commerce, Office of the Chief Economist

Generally speaking, including more sources of pay increases the hourly pay; however broader measures of pay do not necessarily show a higher pay premium. The size of the manufacturing pay premium depends on the prevalence of a specific pay component in manufacturing relative to the private sector as a whole. For example, if manufacturing workers are more likely than the average worker to receive shift differentials (extra compensation for hours worked outside of standard shift hours), then we would expect to see a higher manufacturing pay premium estimate from measures of pay that includes shift differentials. Unfortunately, we do not have information on the prevalence of these pay components across industries, so we cannot determine to what extent these differences account for the differences in the estimated pay premium.

^A See Appendix I for a complete list of how pay is defined for all ten datasets.

^B Some components of supplemental pay are included in CPS estimates of usual weekly earnings, but not estimates of hourly earnings, which are intended to capture the stated wages of hourly workers.

Estimates of the Manufacturing Pay Premium from Ten Federal Government Datasets

Table 1 presents the most recently available average pay data for the manufacturing sector and for private industry, as a whole, from ten different federal government data sources.¹² The table also includes a simple measure of the manufacturing pay premium: the ratio of the average pay in manufacturing to the average pay in the private sector—without taking into account any differences in job or worker

characteristics between the average manufacturing worker or job and the overall average job across the private sector. A ratio greater than one indicates that the average pay in manufacturing is greater than the average pay in the private sector and that, therefore, there is a pay premium in manufacturing. Taken together, these sources, which all show ratios greater than one, suggest that there is a manufacturing pay premium.

In what follows, we explore some of the characteristics of the datasets that help explain differences in the estimates of the pay

Table 1. Pay in Manufacturing and the Private Sector, 2013 and Most Recent Period

| Data Source and Measure of Pay | Publishing Organization | Most Recent Data [1] | | | | 2013 Ratio: Manufacturing/All Private Sector |
|--|-----------------------------|----------------------|---------------|--------------------|---|--|
| | | Coverage Period | Manufacturing | All Private Sector | Ratio: Manufacturing/All Private Sector | |
| <i>Average hourly wages, salaries, or earnings:</i> | | | | | | |
| Current Employment Statistics [2] | Bureau of Labor Statistics | August 2015 | \$ 25.33 | \$ 25.09 | 1.01 | 1.02 |
| National Income and Product Accounts | Bureau of Economic Analysis | 2013 | \$ 31.19 | \$ 29.50 | 1.06 | 1.06 |
| Employer Costs for Employee Compensation | Bureau of Labor Statistics | Q2 2015 | \$ 24.10 | \$ 21.82 | 1.10 | 1.09 |
| Current Population Survey [3] | Bureau of Labor Statistics | Q2 2015 | \$ 17.35 | \$ 15.59 | 1.11 | 1.09 |
| Occupational Employment Statistics | Bureau of Labor Statistics | May 2014 | \$ 23.37 | \$ 22.17 | 1.05 | 1.06 |
| <i>Average weekly wages, salaries or earnings:</i> | | | | | | |
| Current Employment Statistics [2] | Bureau of Labor Statistics | August 2015 | \$ 1,033 | \$ 868 | 1.19 | 1.20 |
| Quarterly Census of Employment and Wages [2] | Bureau of Labor Statistics | Q1 2015 | \$ 1,275 | \$ 1,056 | 1.21 | 1.23 |
| Current Population Survey [4] | Bureau of Labor Statistics | Q2 2015 | \$ 1,164 | \$ 1,149 | 1.01 | 1.07 |
| <i>Average monthly wages, salaries, or earnings:</i> | | | | | | |
| Quarterly Workforce Indicators [5] | Census Bureau | Q1-Q4 2013 | \$ 5,090 | \$ 4,252 | 1.20 | 1.20 |
| <i>Average quarterly wages, salaries, or earnings:</i> | | | | | | |
| County Business Patterns | Census Bureau | Q1 2013 | \$ 13,473 | \$ 11,934 | 1.13 | N/A |
| <i>Average annual wages, salaries or earnings:</i> | | | | | | |
| Quarterly Census of Employment and Wages [2] | Bureau of Labor Statistics | 2014 | \$ 62,977 | \$ 51,295 | 1.23 | 1.23 |
| Economic Census [2] | Census Bureau | 2012 | \$ 52,686 | \$ 46,695 [6] | 1.13 | N/A |
| County Business Patterns [7] | Census Bureau | 2013 | \$ 54,258 | \$ 47,534 | 1.14 | 1.14 |
| National Income and Product Accounts | Bureau of Economic Analysis | 2014 | \$ 64,021 | \$ 51,710 | 1.24 | 1.24 |
| American Community Survey [8] | Census Bureau | 2014 | \$ 41,880 | \$ 31,754 [9] | 1.32 | 1.32 |

Notes: [1] Data are the most recent as of September 17, 2015.
[2] Data for the most recent period was preliminary at the time of publication.
[3] Hourly earnings data only covers workers who are paid on an hourly basis, which accounts for approximately 3/5 of all wage and salary workers.
[4] Usual weekly earnings of full-time wage and salary workers.
[5] National QWI dataset, four-quarter averages.
[6] Excludes the construction sector.
[7] Annual pay per employee is based on annual payroll and first quarter employment.
[8] Median earnings are presented. Data is from the 1-year sample.
[9] Data is for all private employees ages 16 and older, including the incorporated self-employed.

Source: Department of Commerce, Office of the Chief Economist analysis using data from the Bureau of Labor Statistics, the Census Bureau, and the Bureau of Economic Analysis.

¹² For the purpose of this report, we focus on private sector employees. See Appendix 2 for additional information on employee coverage.

premium, and we discuss the importance of selecting appropriate comparison groups. To facilitate comparability, we focus on annual estimates for 2013, the most recent year for which data from all datasets except the 5-year Economic Census is available.¹³ The 2013 estimates are shown in the last column of Table 1.

A straightforward way to measure the pay premium is to compare the average hourly pay in manufacturing to the average hourly pay in the private sector overall.¹⁴ The top part of Table 1 provides estimates of the hourly pay premium in manufacturing from the five datasets for which this information is available. For 2013, the premium measured in this way ranges from 2 percent to 9 percent.

It is important to note that Table 1 includes only monetary earnings in the measurement of pay. Additional analysis of the manufacturing pay premium could incorporate a broader measure of compensation that would include employer-provided (fringe) benefits such as insurance (e.g. health, life, disability); contributions to retirement plans; and legally-required benefits (e.g. unemployment insurance, workers' compensation). Figure 1 displays the hourly pay premium for two datasets for which data on earnings and total compensation are available. When benefits for manufacturing workers and private sector workers are considered, the estimated total compensation premium for

¹³ Annual payroll data for 2013 is available from the County Business Patterns program, but employment data is only available for the first quarter of that year. The latest data from the Economic Census is for 2012.

¹⁴ Some datasets allow comparison to non-manufacturing in addition to the private sector overall, but the results are essentially the same. For example, using Current Employment Statistics and National Income and Product Accounts data, the estimated hourly premiums for manufacturing were one percentage point higher than the results presented in Table 1. Since not all datasets allow for the calculation of pay for the non-manufacturing sector, throughout the rest of this report, we compare manufacturing pay to the private sector.

manufacturing workers increases. This is not surprising because manufacturing workers typically have greater access to employer-provided benefits than the average private sector worker.¹⁵

Hours of Work and the Pay Premium

Table 1 shows an hourly pay premium in the range of 2 to 9 percent, but other measures of pay, such as weekly, monthly, quarterly and annual pay, are also available from the data sources we examine. Table 1 shows that the manufacturing pay premium for weekly pay is in the range of 7 to 23 percent, while the annual pay premium is in the range of 14 to 32 percent. The average manufacturing employee works more hours per week and more weeks per year than the average private sector employee, so the longer hours worked amplifies the hourly pay premium when pay is measured over weeks, months, quarters, and years.

Specifically, average weekly hours of manufacturing employees in 2013 were 40.8 hours, or more than 6 hours higher than the private sector average of 34.4 hours.¹⁶ Even if hourly pay were equal across manufacturing and the private sector, these differences in weekly hours would result in the average manufacturing employee earning 19 percent more per week than the average private sector employee. Furthermore, manufacturing workers, on average, worked 48.4 weeks in 2013, more than the 46.4 worked by the

¹⁵ See Bureau of Labor Statistics, Employee Benefits in the United States March 2014, available at <http://www.bls.gov/news.release/pdf/ebs2.pdf>.

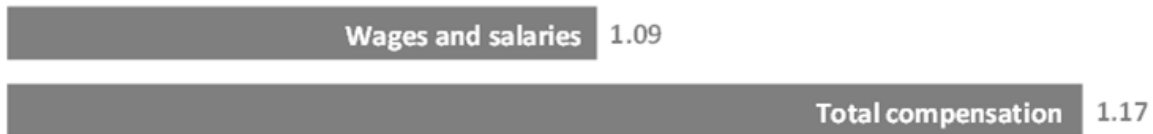
¹⁶ Data on average weekly hours is from the Current Employment Statistics survey available at: <http://www.bls.gov/ces/>. In July 2015, the latest data available, average weekly hours for manufacturing employees were 40.7 versus 34.6 for all private sector employees.

Figure 1. Ratios of Manufacturing Hourly Pay to Overall Private Sector Hourly Pay, Wages and Salaries vs. Total Compensation, 2013

National Income and Product Accounts



Employer Costs for Employee Compensation



Source: Department of Commerce, Office of the Chief Economist analysis using data from the Bureau of Economic Analysis and the Census Bureau.

average private sector employee.¹⁷ Therefore, the cumulative effect of more hours worked per week and more weeks worked per year would increase the pay premium to 24 percent, even with no difference in hourly pay.

To further explore the issue of how the measurement period affects the estimated pay premium, we examine estimates from sources that provide both a measure of hourly earnings and a measure of earnings over a longer time period. These sources are the National Income and Product Accounts (NIPAs), the Current Employment Statistics (CES) survey, and the CPS.

Figure 2 shows the ratios of pay in manufacturing to pay in the private sector, calculated using these three different data sources. The NIPA and CES estimates, which are based on employer payrolls, suggest that the longer the time period of payment, the larger the premium. Using the NIPA data, hourly

earnings in manufacturing are 6 percent higher than in the private sector overall, but annual earnings are 24 percent higher. Similarly, the CES data shows that average hourly earnings in manufacturing and in the private sector overall are about equal, but weekly earnings in manufacturing are about 20 percent higher than the private sector average.

In contrast, the CPS estimates do not show a large difference between the hourly and weekly earnings premium. The CPS shows hourly earnings about 9 percent higher in manufacturing than the private sector, and usual weekly earnings about 7 percent higher. Thus, while the data shows an earnings premium in both cases, the premium per hour appears smaller than the premium per week. However, these results must be interpreted with caution. The CPS hourly earnings statistics are based on the wage rate of only those workers who are paid on an hourly basis, which represents about three-fifths of workers covered by the survey. In contrast, the statistics on usual weekly earnings pertain only to full-time workers and can include components of

¹⁷ OCE tabulations of 2014 CPS ASEC data on weeks worked per year.

Figure 2. Ratios of Manufacturing Pay to Overall Private Industry Pay for Various Measurement Periods, 2013

National Income and Product Accounts



Current Employment Statistics



Current Population Survey [1]



[1] Pay data is for all wage and salary workers, which includes the private and government sectors. Hourly earnings data only covers workers who are paid on an hourly basis, which accounts for approximately 3/5 of all wage and salary workers.
 Source: Department of Commerce, Office of the Chief Economist analysis using data from the Bureau of Economic Analysis and the Bureau of Labor Statistics.

pay in addition to the wage (if those components are usually paid).¹⁸ In short, the hourly and weekly earnings data cover different sets of workers and therefore are not directly comparable even though they come from the same data source.¹⁹

Figure 3, while further highlighting the importance of hours of work, also shows that the size of the earnings premium can vary depending on the segment of the workforce considered. Specifically, Figure 3 shows estimates from three data sources—the NIPAs,

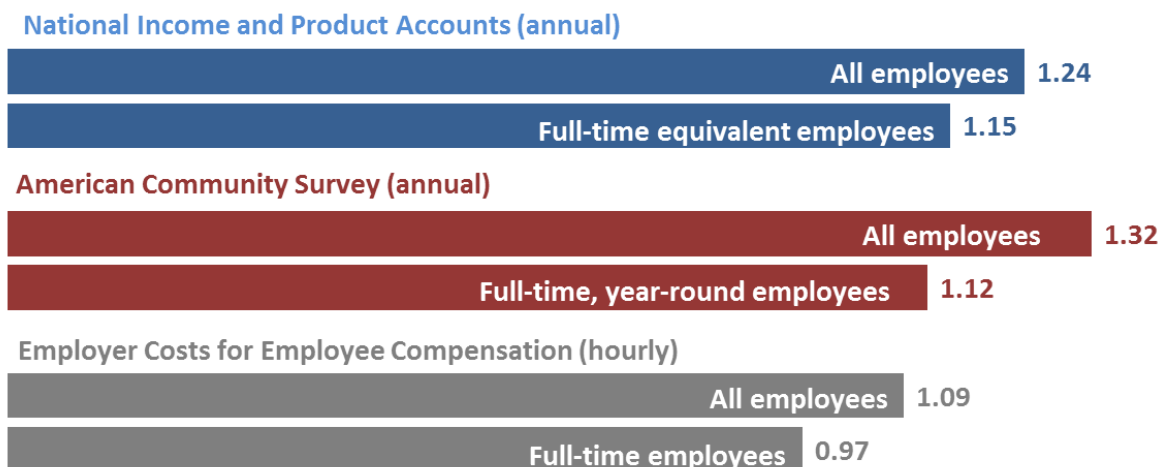
ACS, and Employer Costs for Employee Compensation (ECEC)—that provide earnings data for all workers and for full-time workers only and show that the manufacturing pay premium is lower when part-time workers are excluded from the comparisons. According to the 2013 NIPA data, manufacturing workers have average annual wages and salaries that are 24 percent higher than those of all private sector workers. However, the pay premium is smaller, only 15 percent, when considering the earnings of full-time equivalent workers. Data for 2013 from the ACS shows a similar result. Median annual earnings for all employees were 32 percent higher in manufacturing than in the overall economy; but considering only full-time, year-round employees, the median annual earnings premium in manufacturing— 12 percent—was less pronounced.

Excluding part-time workers has the effect of raising average annual earnings because part-time workers, by definition, work and, generally, earn less on an annual basis than full-time workers. In 2014, almost a quarter (23.7 percent) of all wage and salary workers worked

¹⁸ In the CPS, respondents are asked for their hourly wage, excluding tips, bonuses and overtime, if they are paid by the hour, but are also given the option of reporting their pay on a different basis, such as weekly, monthly, or annually. If respondents choose to report their earnings on a basis other than hourly, their responses are not used to compute average hourly earnings but are used to compute usual weekly earnings.

¹⁹ The Bureau of Labor Statistics does not publish average hourly earnings statistics from CPS based on all workers. Meisenheimer II, Joseph R., “Real compensation, 1979 to 2003: analysis from several data sources,” *Monthly Labor Review*, May 2005, p. 21, available at: <http://www.bls.gov/opub/mlr/2005/05/art1full.pdf>.

Figure 3. Ratios of Manufacturing Pay to Overall Private Industry Pay for All Employees and Full-Time Employees, 2013



Source: Department of Commerce, Office of the Chief Economist analysis using data from the Bureau of Economic Analysis, the Census Bureau, and the Bureau of Labor Statistics.

part-time (or less than 35 hours a week) according to the CPS. For the manufacturing sector, the share of workers who typically worked part-time was only 10.9 percent. Because a relatively small percentage of the manufacturing workforce is part-time, taking these workers out has a smaller effect on average annual earnings in manufacturing than it does for all wage and salary workers. For this reason, the manufacturing pay premium for annual pay is smaller when considering only full-time workers.

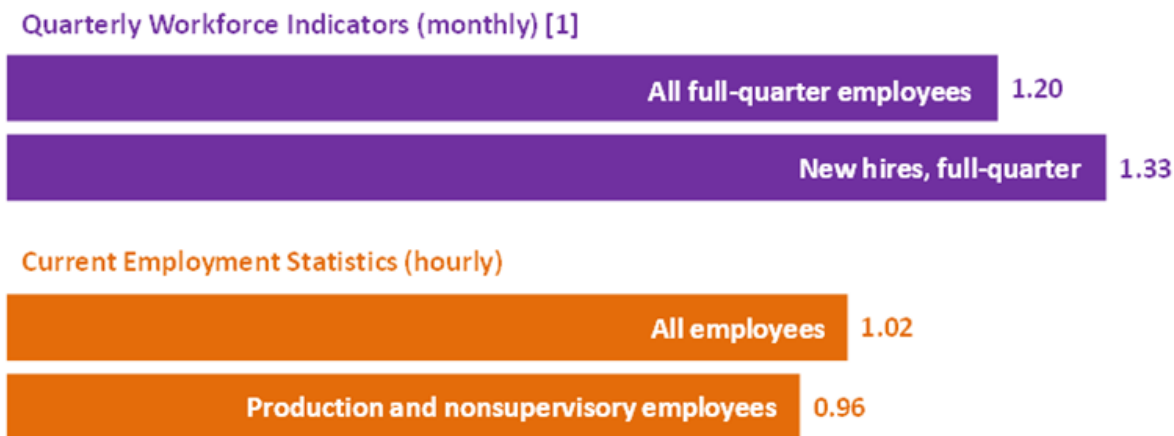
Like the NIPAs and the ACS, the ECEC data shows a higher pay premium when all workers are included than when only full-time workers are considered. However, the ECEC estimates are different because they pertain to hourly earnings, defined as the hourly straight-time wage rate for workers paid on an hourly basis, or as the straight-time earnings divided by the corresponding hours of work for those not paid on an hourly basis. According to the 2013 ECEC data, hourly earnings for all employees in manufacturing were 9 percent higher in manufacturing than in private industry overall.

However, among full-time workers, average hourly earnings were lower in manufacturing: 97 percent of the overall private industry average for full-time workers.

Pay Premiums for Select Workers

As highlighted in the previous discussion, the magnitude of the pay premium can depend on the population of workers that makes up the comparison group. This point is further illustrated in Figure 4, which compares pay premiums for different worker populations from the same data sources. The first set distinguishes between the premium for all employees and the premium for new hires only—as measured by the Quarterly Workforce Indicators (QWI), which uniquely identifies newly hired workers. The second set distinguishes between the premium for all employees and the premium for production and nonsupervisory workers (PE), a group uniquely

Figure 4. Ratios of Manufacturing Pay to Overall Private Industry Pay for Selected Worker Groups, 2013



Note: [1] National QWI 4-quarter averages.

Source: Department of Commerce, Office of the Chief Economist analysis using data from the Bureau of Economic Analysis, the Census Bureau, and the Bureau of Labor Statistics.

identified in the CES.²⁰ Wages of production and nonsupervisory workers are frequently cited by observers of pay in the manufacturing sector.²¹

Figure 4 shows that the earnings premium is different for new hires than for all workers. The QWI reports average monthly earnings of all

workers employed for a full quarter, and separately reports the average monthly earnings of new hires (full-quarter employees who were newly hired during the previous quarter). According to the QWI data, average monthly earnings in 2013 were 19 percent higher for all employees in manufacturing than for all employees across all private industries. But among new hires only, average monthly earnings were 33 percent higher in manufacturing than in all industries. It is not clear why the manufacturing pay premium would be greater for new hires than for employees overall. One possible explanation is hours worked: as noted above, workers in manufacturing work more hours than workers overall. If the greater hours of work observed in manufacturing is even more pronounced for new hires, it can show up as a larger pay premium.²²

²⁰ See the CES technical notes for the full definition of production and nonsupervisory employees (PE) at: <http://www.bls.gov/web/empsit/cestn.htm#section4>. For the manufacturing sector, PE include working supervisors and all nonsupervisory employees (including group leaders and trainees) engaged in activities closely associated with fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping, trucking, hauling, maintenance, repair, janitorial, guard services, product development, auxiliary production for plant's own use (for example, power plant), recordkeeping, and other services closely associated with the above production operations.

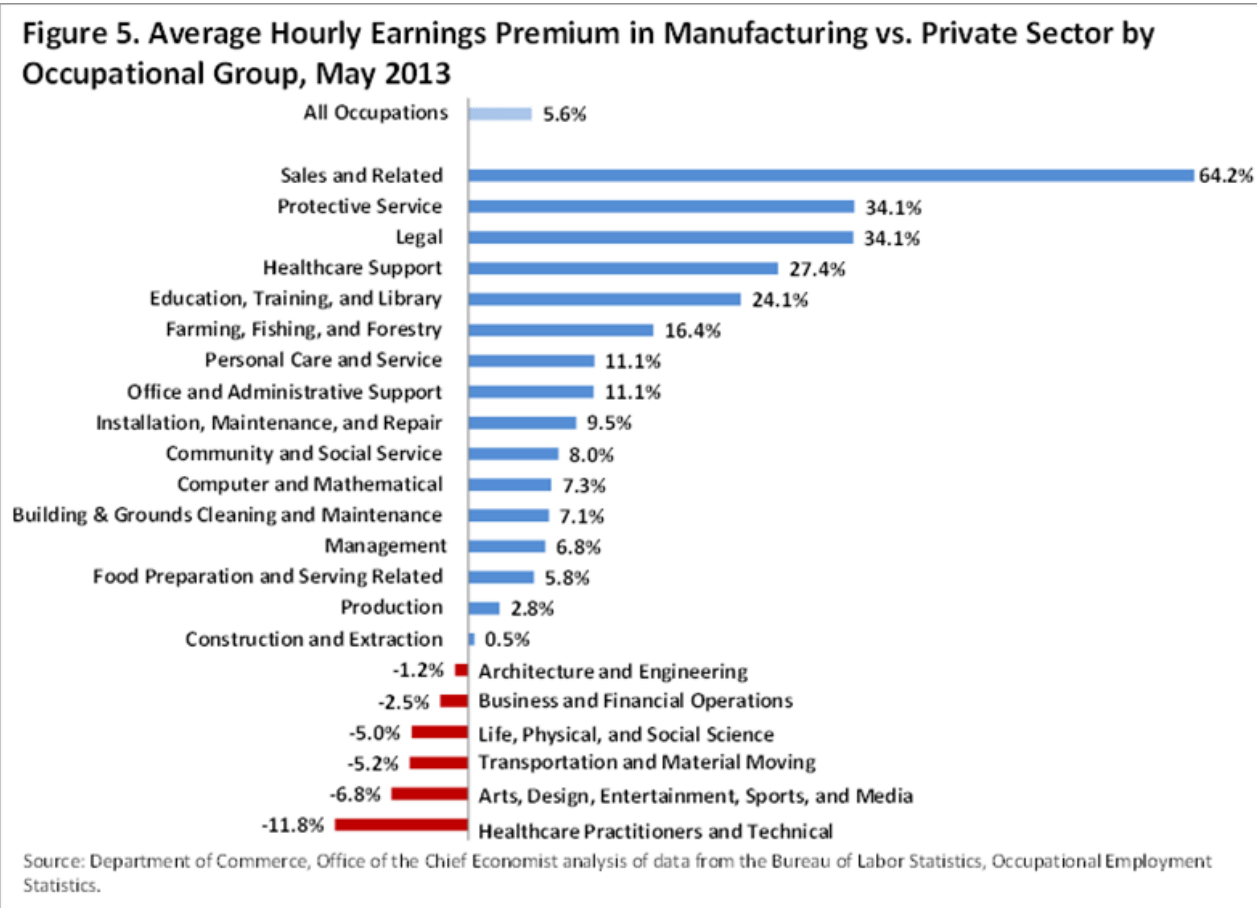
²¹ See, for example, Levinson, Marc, "Job Creation in the Manufacturing Revival," Congressional Research Service Report R41898, July 2, 2015, available at: <https://www.fas.org/sgp/crs/misc/R41898.pdf> and Fox, Justin, "Farewell to the Blue-Collar Elite," Bloomberg View, April 6, 2015, available at: <http://www.bloombergview.com/articles/2015-04-06/factory-worker-wages-are-nothing-special-these-days>.

²² Another explanation is that manufacturers have a two-tiered hiring system, with higher-paid workers coming on board as employees and therefore counted as new hires, and lower-paid workers brought on as temporary workers and thus not counted as new hires at all. Additional research is needed to explore these issues.

Figure 4 also shows the manufacturing premium, using the CES, for all employees as well as for PE workers only. Both show little or no pay premium for manufacturing. However, the latter comparison is problematic because the CES definition of PE in manufacturing is much narrower than the definition of PE in the service-providing industries (that is, industries other than mining, construction and manufacturing). For the manufacturing sector, the PE category includes working supervisors and all non-supervisory employees engaged in *activities closely associated with production operations*; these workers represented 70 percent of all manufacturing jobs in 2013. For service-providing industries, the PE category is a broader, more heterogeneous group that

includes most employees that are not supervisors, *regardless of the type of work they perform*. For example, this group can include office and clerical workers, physicians, teachers, lawyers, and salespersons. In 2013, PEs represented about 83 percent of all service-providing industry jobs.

It might be more precise to compare manufacturing and private sector pay by specific occupations because, even across industries, workers in a specific occupational group are more likely to perform similar work. Figure 5 offers a preliminary analysis drawing upon Occupational Employment Statistics (OES) hourly earnings estimates for each major occupational group.²³



²³ See <http://www.bls.gov/soc/#classification> for more information on the Standard Occupational Classification system.

Using the OES, across all occupations, hourly earnings for manufacturing workers are about 6 percent higher than the average across the private sector; however, the differences within specific occupations are considerable. For six occupations, shown in red, workers in manufacturing earn less than their private industry counterparts. Workers in production occupations (as classified by SOC 51-0000) in the manufacturing sector earn 2.8 percent more, on an hourly basis, than workers in production occupations in the private sector as a whole. This contrasts with the results discussed above which showed a slightly lower pay for manufacturing PEs relative to all PEs, but which are based on different definitions of the PE category across the two sectors.²⁴

Further Research on the Manufacturing Pay Premium

Additional research could go beyond an examination of how different datasets affect the premium to shed light on what drives the existence of the premium and how it has

²⁴ In a November 2014 report, NELP estimated that workers in manufacturing earned 7.7 percent less than all workers in the public and private sectors. That report compared the median hourly wage of workers in production occupations in manufacturing (SOC 51-0000) to the earnings of *all* workers in both the public and private sector (all SOC codes, or SOC 00-0000). Because workers in production occupations made up just over half of employment in the manufacturing sector in 2013, the NELP method compared the hourly earnings of only half of the workers in manufacturing to all workers in the U.S. economy, which is not a proper comparison for estimating an earnings premium. As shown in Figure 5, when only workers in production occupations are considered for both manufacturing and the comparison group, there is a 2.8 percent earnings premium for manufacturing workers. Using median hourly earnings rather than average hourly earnings, and including public sector workers in the comparison group, as the NELP estimates do, manufacturing workers in production occupations earn a 4.2 percent premium over workers in production occupations in other sectors.

changed over time.²⁵ In particular, a more detailed analysis of industries within the manufacturing sector would be useful. Manufacturing, like other sectors, comprises industry groups that often have different characteristics from the sector average. Within manufacturing, for example, pay in the textile manufacturing industry varies substantially from pay in the transportation equipment industry.²⁶ Data on new hires and separations within the higher-paying and growing manufacturing industries might help explain trends in the overall manufacturing premium.

Like industries in the manufacturing sector, the occupational mix of the manufacturing sector is heterogeneous, and the average pay in these occupations varies. While touched on in this report, occupational pay premiums could be further explored. The occupational pay

²⁵ Inter-industry pay differentials have been a topic of research for some time. Some research points to “efficiency wages” as an explanation for manufacturing pay premium. Under this line of reasoning, a pay premium arises because workers in certain industries are paid above-average wages to ensure that they are appropriately skilled and motivated. Such skill and motivation may be particularly important for manufacturing firms, which are generally more capital-intensive and larger and therefore require workers that manage themselves effectively. For citations to such research, see Helper, Susan, Timothy Krueger, and Howard Wial. “Why Does Manufacturing Matter? Which Manufacturing Matters? A Policy Framework.” Metropolitan Policy Program at Brookings, February 2012, available at http://www.brookings.edu/~media/Research/Files/Papers/2012/2/22%20manufacturing%20helper%20krueger%20wial/0222_manufacturing_helper_krueger_wial.pdf (at page 5). Helper et al. also mention other possible explanations for a manufacturing pay premium, including arguments that (1) manufacturing jobs are less pleasant or safe than others and therefore require compensating higher pay; (2) unmeasured or unobservable worker or job characteristics explain the higher wages; and (3) unions bid up wages. However, they suggest that there is little evidence to support these explanations.

²⁶ In 2014, workers in the textile manufacturing industry were paid \$16.02 per hour while workers in the transportation equipment manufacturing industry were paid \$29.85 per hour.

variation is likely at least partially the result of differences in the education and experience required for specific occupations. Previous OCE research found that manufacturing workers enjoyed wage and benefit premiums even after controlling for education and other factors;²⁷ this research can be updated and expanded to examine more recent trends in manufacturing pay and to examine other factors, such as firm age and firm size, that might be correlated with higher earnings.

Both union membership and coverage are down substantially over the past few decades for all workers, including manufacturing workers. In 2014, 7.4 percent of all private sector workers were covered by a collective bargaining agreement, and 6.6 percent were union members.²⁸ For the manufacturing sector, the shares are higher—9.7 percent of workers are members and 10.5 percent are covered. Nonetheless, unionization rates remain relatively high in some sectors, so the effect of unions on hiring practices and pay in different manufacturing industries deserves further exploration.

Similarly, the manufacturing sector’s increasing use of temporary workers may affect the pay premium for manufacturing. Temporary workers are typically paid less than permanent employees and are less likely to earn benefits.²⁹ If the relative use of temporary workers in

manufacturing and the private sector were taken into account, the manufacturing pay (and total compensation) premium could be reduced or disappear completely.³⁰ Thus, additional research should explore the use of temporary workers within manufacturing industries, as well as its impact on the hiring and pay of traditional employees.

Conclusion

This report has shown that the size of the manufacturing pay premium is a function of various factors, including which dataset is used to address this question. No single dataset stands out as the best one for measuring the “true” pay premium. Instead, the choice of dataset depends on the specific question at hand. Datasets providing estimates of hourly pay tend to show a smaller premium than measures that capture pay received over longer time periods. Further, measures restricted to the earnings of full-time workers tend to show a smaller premium than those that capture the earnings of all workers. Together, these findings suggest that an important source of the pay premium for manufacturing workers is that they work more hours than other workers.

The reality is that manufacturing is not one economic activity, but comprises millions of

²⁷ Langdon and Lehrman (2012).

²⁸ See <http://www.unionstats.com/> section I. U.S. Historical Tables: Union Membership, Coverage, Density and Employment, 1973-2014. Workers are counted as covered by a collective bargaining agreement if they are union members or non-members covered by a union contract.

²⁹ According to the 2005 Current Population Survey Contingent Worker Supplement (the latest available), 8.3 percent of all temporary workers were covered by employer-provided health insurance and 3.8 percent were included in an employer-provided pension plan. The comparable figures for workers in traditional work arrangements were 56.0 percent and 47.7 percent. Available at: <http://www.bls.gov/news.release/pdf/conemp.pdf>.

³⁰ Federal government surveys that measure employment and pay do not ask firms about their use of temporary workers in a way that counts these workers as part of the firms’ labor force. Instead, temporary workers are classified as employees in a separate industry called “temporary help services.” All temporary workers are included in this industry whether they report to work at a factory or a doctor’s office or a retail outlet. This method of classifying temporary workers makes it impossible to identify which industries are using temporary workers and whether they are using them as a substitute for traditional permanent employees. However, preliminary calculations based on reasonable assumptions about the use of temporary workers in manufacturing and using May 2014 OES data suggest that the pay premium declines by about two percentage points when some temporary workers are included in the manufacturing sector.

workers in hundreds of thousands of establishments across a multitude of industries – so a single number would not capture the benefits of working in manufacturing. Further research is needed to build on the pay premium estimates presented here and to refine our understanding of manufacturing jobs and better assess the characteristics that have traditionally contributed to them being considered good jobs.

Additional research could also explore other potential reasons that the manufacturing premium exists. Analyses that simultaneously account for the many factors that affect the pay premium would more precisely estimate the differential between pay in manufacturing versus other sectors. This could be done through regression analyses that control for variables such as education, age, occupation and other characteristics that might affect pay. By providing a descriptive analysis of the many datasets that can be used to analyze manufacturing earnings, and providing some results based on type of worker and occupation, this report represents a first step in that direction.

Appendix 1 – Methodological Summary for Ten Federal Earnings Datasets

The **American Community Survey (ACS)** is a national household survey that uses continuous measurement methods. In this survey, a series of monthly samples produce annual estimates for the same small areas (census tracts and block groups) formerly surveyed via the decennial census long-form sample. The ACS collects information from individuals about demographics, employment and earnings, educational attainment, housing characteristics, social issues, and other topics. Approximately 3.5 million housing units and group quarters are sampled each year. Estimates are released for 5- and 1-year periods at various levels of geographic detail. The ACS collects information about earnings during the 12-month reference period (the previous 12 months from the date the questionnaire is filled out). Estimates are published for workers 16 years and older with earnings; for all employees; and full-time, year-round civilian employees 16 years and older with earnings; and other subgroups. Earnings are defined as the sum of wage or salary income from all jobs and net income from self-employment. Wage or salary income includes total money earnings received for work performed as an employee during the past 12 months. It includes wages, salary, Armed Forces pay, commissions, tips, piece-rate payments, and cash bonuses earned before deductions were made for taxes, bonds, pensions, union dues, etc. See <http://www.census.gov/programs-surveys/acs/> for more information.

The **County Business Patterns (CBP)** program provides subnational economic statistics by industry for employer businesses, including the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll. The universe of employer establishments for CBP is the Census Bureau's Business Register, which contains information

for each known establishment in the U.S. Payroll and employment data is tabulated from administrative records for single-unit companies and a combination of administrative records and survey-collected data for multi-unit companies. Payroll includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation allowances, sick-leave pay, and employee contributions to qualified pension plans paid during the year to all employees. For corporations, payroll includes amounts paid to officers and executives; for unincorporated businesses, it does not include profit or other compensation of proprietors or partners. Payroll is reported before deductions for social security, income tax, insurance, union dues, etc. See <http://www.census.gov/econ/cbp/> for more information.

The **Current Employment Statistics (CES)** provides data based on a monthly survey of approximately 143,000 nonagricultural business establishments and government agencies representing approximately 588,000 worksites throughout the U.S. CES average earnings are a measure of gross payrolls divided by total hours paid during the pay period that includes the 12th day of the month. Payroll is for full- and part-time workers who received pay for any part of the pay period, and is reported before deductions of any kind, such as those for old-age and unemployment insurance, group insurance, withholding tax, bonds, or union dues; also included is pay for overtime, holidays and vacation, sick leave paid directly by the firm, and commissions paid at least monthly. Bonuses (unless earned and paid regularly each pay period); other pay not earned in the pay period reported (such as retroactive pay); and the value of free rent, fuel, meals, or other payment in kind are excluded. Employee benefits (such as health and other types of insurance, contributions to retirement, and so forth, paid by the employer) also are excluded. See <http://www.bls.gov/ces/> for more information.

The **Current Population Survey (CPS)** is a probability selected monthly sample survey of about 60,000 occupied households from all 50 states and the District of Columbia, representing the civilian non-institutional population age 15 years and older (although published data typically pertains to persons age 16 and over). Respondents answer questions that typically refer to work activities during the calendar week that includes the 12th day of the month. Earnings data are collected from one-fourth of the monthly sample. One of the main earnings measures developed from CPS data is the usual weekly earnings of full-time wage and salary workers, which is based on a wage earner's report of the total gross pay usually received before deductions for taxes, social security, and other mandatory deductions. Gross pay includes any overtime pay, tips, or commissions usually received. Data also is collected on the hourly earnings of workers paid by the hour. Hourly earnings for hourly paid workers do not include overtime pay, commissions, or tips received. See <http://www.census.gov/cps/> and <http://www.bls.gov/cps/> for more information.

The quinquennial **Economic Census** (conducted for years ending in 2 or 7) collects data, under the mandatory authority of Title 13 of the U.S. Code, from establishments that are located in the U.S., have paid employees, and are classified in North American Industry Classification System (NAICS) sectors other than agriculture, forestry, fishing, and hunting (Sector 11) and public administration (Sector 92). Large- and medium-sized single-establishment companies and all establishments of multi-establishment companies are surveyed. For small single-establishment companies, data is based on a sample survey or administrative records provided to the U.S. Census Bureau by other federal agencies. The Economic Census provides data on total employment and gross payroll earnings of all employees of all operating establishments in the calendar year. Gross payrolls include salaries, wages, commissions,

dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' social security contributions, withholding taxes, group insurance, union dues, and savings bonds. See <http://www.census.gov/econ/census/> for more information.

The **Employer Costs for Employee Compensation (ECEC)** program publishes data on employers' expenditure on wages and salaries collected through the National Compensation Survey. The ECEC provides data on hourly costs for employee compensation (including wages and salaries and benefits) on a quarterly basis. Wages and salaries are defined as the hourly straight-time wage rate or, for workers not paid on an hourly basis, straight-time earnings divided by the corresponding hours. Straight-time wage and salary rates are total earnings before payroll deductions, including production bonuses, incentive earnings, commission payments, and cost-of-living adjustments. This measure does not include compensation such as tips. See latest data at <http://www.bls.gov/ect/> and <http://www.bls.gov/opub/hom/pdf/homch8.pdf> for more information.

The **National Income and Product Accounts (NIPA)** provides data on hourly wages and salaries of employees, measured as payments to all employees divided by total hours of work of all employees. The NIPAs also provide data on annual wages and salaries of employees. These payments include monetary remuneration to employees and to corporate officers at regular intervals, including piecework payments; overtime or unusual-hour payments; payments for periods away from work due to temporary discontinuation of production, such as holidays or absences for illness; allowances for unusual location or conditions; early retirement (buyout) payments; severance pay; jury, witness, and other compensatory fees; and regular supplementary allowances, such as housing allowances. It also includes incentive payments, commissions, tips, and bonuses

payable to employees and to corporate officers; employee gains from exercising nonqualified stock options (NSOs); wages and salaries paid to employees of unincorporated enterprises; and in-kind payments such as transit subsidies, meals, and lodging. The primary source data for information on annual wages and salaries and number of employees is the Quarterly Census of Employment and Wages (QCEW) program. Other source data is used for certain industries for which the QCEW provides little or no coverage. The Bureau of Labor Statistics (BLS) also provides the primary source data for information on hours of work. See http://www.bea.gov/iTable/index_nipa.cfm and <http://www.bea.gov/national/pdf/chapter10.pdf> for more information.

The **Occupational Employment Statistics (OES)** program provides data on hourly earnings of workers based on employer reports of straight-time wages. The OES program surveys approximately 200,000 establishments every six months, taking three years to fully collect the sample of 1.2 million establishments. Wages are straight-time, gross pay, exclusive of premium pay and include base rates, commissions, cost-of-living allowances, deadheading pay, guaranteed pay, hazard pay, incentive pay, longevity pay, over-the-road pay, piece rates, portal-to-portal rates, production bonuses, and tips. Wages do not include overtime pay and exclude attendance bonuses, back pay, clothing allowances, merchandise and other discounts, draws, holiday bonuses, holiday premium pay, jury duty pay, meal and lodging payments, non-production bonuses, on-call pay, overtime pay, perquisites, profit-sharing payments, relocation allowances, severance pay, shift differentials, stock bonuses, tool/equipment allowances, tuition repayment, uniform allowance, weekend premium pay, and year-end bonuses. See <http://www.bls.gov/oes/> for more information.

The **Quarterly Census of Employment and Wages (QCEW)** program publishes quarterly and annual counts of employment and wages

reported by employers covering 98 percent of U.S. jobs, available at the county, MSA, state and national levels by industry. The data comes from the BLS business register of active business establishments in the U.S., which serves as the sampling frame and benchmark for several BLS establishment surveys. The data is derived from summaries of employment and total pay of workers covered by state and federal unemployment insurance (UI) legislation and provided by state workforce agencies. In the first quarter of 2014, UI records were submitted by 9.4 million establishments. Major exclusions from UI coverage include self-employed workers, most agricultural workers on small farms, all members of the Armed Forces, elected officials in most states, most employees of railroads, some domestic workers, most student workers at schools, and employees of certain small nonprofit organizations. Monthly employment is based on the number of workers who worked during or received pay for the pay period including the 12th of the month. Workers on paid vacations and part-time workers also are included. Average weekly wage values are calculated by dividing quarterly total wages by the average of the three monthly employment levels (all employees, as described above) and dividing the result by 13, for the 13 weeks in the quarter. Included in the quarterly wage data are non-wage cash payments such as bonuses, the cash value of meals and lodging when supplied, tips and other gratuities, and, in some states, employer contributions to certain deferred compensation plans such as 401(k) plans and stock options. See <http://www.bls.gov/cew/> for more information.

The **Quarterly Workforce Indicators (QWI)** is a product of the Longitudinal Employer-Household Dynamics program. The QWI provides tabulations of earnings and employment data reported at the employer level. The program uses state-reported earnings data from administrative records on employers (namely, state unemployment insurance systems), representing approximately 96

percent of employment. The linkage of employer and employee information allows for the identification of the number of job changes, the number of hires and separations, and the earnings of hired and separated workers. Total quarterly earnings capture straight wages and supplemental pay reported by employers. Average monthly earnings are based on total reported quarterly earnings. Earnings include gross wages and salaries, bonuses, stock options, tips and other gratuities, and the value of meals and lodging, when supplied. In some of states, employer contributions to certain deferred compensation plans, such as 401(k) plans, are included in total wages. Total wages, however, do not include employer contributions to Old-age, Survivors and Disability Insurance (OASDI); health insurance; unemployment insurance; workers' compensation; and private pension and welfare funds. This gross amount includes cash allowances and the cash equivalent of any type of remuneration. It includes all lump-sum payments for terminal leave, withholding taxes, and retirement deductions. See <http://lehd.ces.census.gov/> for more information.

Appendix 2 – Worker Coverage of Pay Data Used to Calculate the Manufacturing Pay Premium

Generally, the pay data used in this report pertains to earnings of employees in the manufacturing sector and employees in all of the private sector. However, as a result of numerous methodological differences, as discussed throughout the report and in Appendix 1, the ten datasets discussed in this report cover slightly different groups of employees, albeit with large overlap. In particular, the American Community Survey (ACS) and Current Population Survey (CPS) are household-based surveys that capture civilian workers, and the establishment-based data sources rely on different business registries to define their universe of businesses. Therefore, the pay data for each of these datasets differs, as do the resulting pay premium calculations. This Appendix details the employees covered by each of the ten datasets.

Most of the datasets provide pay data for employees working in the private sector, which excludes the government sector (public administration), the self-employed, and domestic employees working in households. Several of the datasets also exclude employees working in the agriculture, forestry, fishing, and hunting industries. Datasets from the two household-based surveys, the ACS and CPS, cover a wider range of workers. The specific coverage of each of the ten datasets is described below.

American Community Survey (ACS): Covers the resident population of the United States, including the institutional population living in residential treatment facilities and, correctional facilities, the non-institutional population living in college dorms and military barracks, and other group quarters. Earnings data are available for the employed portion of this population age 16 years and older, including the self-employed. This report compares earnings

of the employees of private companies, including those self-employed in an incorporated business, to earnings of those who self-report that they are employed in manufacturing.

County Business Patterns (CBP): Provides payroll data for private business establishments with employees, including businesses in the forestry, fishing, and hunting industries. This report compares payroll per employee for all private employer businesses to that of manufacturing businesses.

Current Employment Statistics (CES): Covers employees of business establishments, excluding businesses in the agriculture, forestry, fishing, and hunting industries. This report compares payroll per employee for all nonfarm private establishments to that of manufacturing establishments.

Current Population Survey (CPS): Provides hourly wage rates for hourly-paid wage and salary workers and weekly earnings estimates for full-time wage and salary workers. These sub-samples of the civilian non-institutional population age 16 and older exclude people serving in the armed forces and the self-employed. This report compares earnings for all private wage and salary workers to those who self-report that they are employed in the manufacturing sector.

Economic Census: Provides payroll data for private business establishments with employees, excluding those in the agriculture, forestry, fishing, and hunting industries. Although data is collected for the construction sector, payroll data for the construction sector is not published. This report compares data on the sum of all included sectors to that of the manufacturing sector.

Employer Costs for Employee Compensation (ECEC): Provides data on employer costs for wages and salaries, and employee benefits for nonfarm private and state and local

government workers. The ECEC sample includes data by worker and establishment characteristics. Data for workers in construction, extraction, farming, fishing, and forestry occupations is also available.

National Income and Product Accounts (NIPA): Provides aggregate estimates of employment and wage and salary payments based on payroll data for private business establishments with employees, including businesses in the agriculture, forestry, fishing, and hunting industries.

Occupational Employment Statistics (OES): Provides payroll data for private business establishments with employees but excludes private household employers and most agriculture, forestry, fishing, and hunting industries, except logging and support activities for crop and animal production.

Quarterly Census of Employment and Wages (QCEW): Provides payroll data for private

business establishments with employees, including businesses in the agriculture, forestry, fishing, and hunting industries.

Quarterly Workforce Indicators (QWI): The program uses state-reported earnings data from administrative records on employers (namely, state unemployment insurance systems), representing approximately 96 percent of employment across private industry, including agriculture, forestry, fishing and hunting. Data is reported at the state level and the national level.

These differences in employee coverage are reflected in the different employment estimates for the manufacturing sector and for the private sector comparison group from each dataset. Table A-1 shows average annual employment for 2013 as reported by the datasets covered in this report. Employment data is not available for two datasets, namely the quinquennial Economic Census, which only collects data for years ending in 2 and 7, and the ECEC, which

Table A-1. Average Annual Employment in Manufacturing and the Private Sector, 2013 (thousands)

| Data source | Manufacturing | All Private |
|--|---------------|-------------|
| American Community Survey | 15,227 | 104,074 [1] |
| County Business Patterns | 11,276 | 118,266 |
| Current Employment Statistics | 12,020 | 114,541 |
| Current Population Survey | 14,484 | 114,120 [2] |
| Employer Costs for Employee Compensation [3] | N/A | N/A |
| Economic Census [4] | N/A | N/A |
| National Income and Product Accounts | 12,028 | 117,955 |
| Occupational Employment Statistics | 11,983 | 111,269 |
| Quarterly Census of Employment and Wages | 11,995 | 112,958 |
| Quarterly Workforce Indicators | 12,032 | 112,324 [5] |

Notes: [1] Includes all private employees ages 16 and older, including incorporated self-employed.
 [2] Excludes unincorporated self-employed. Note that the incorporated self-employed are included here but are not included for estimates on earnings presented in the body of this report.
 [3] No employment data is available.
 [4] Data is only available for years ending in 2 and 7.
 [5] National QWI data, 4-quarter averages.

Source: Bureau of Labor Statistics, the Census Bureau, and the Bureau of Economic Analysis.

does not publish employment data.

As the table shows, the employment levels calculated from each data source do not exactly match, as expected, but most are reasonably close. The household surveys show higher levels and shares of manufacturing employment. For all sources with data available, manufacturing employment represents 10 to 11 percent of total employment, with the exception of the CPS, at 13 percent and the ACS, at 15 percent.

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