



Center for  
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***CROWE Policy Brief***

**Faulty Data Driving the Manufacturing  
“Recession” in Pennsylvania and Wisconsin \***

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**December 5, 2019**

**Abstract**

Nationwide there has been a slowdown in manufacturing employment in 2019, and the decline seemed to be especially strong in Pennsylvania and Wisconsin. Since these manufacturing-heavy states are both politically sensitive, this slowdown has attracted significant attention. I show that most of this slowdown results from preliminary data which has proved inaccurate. At least through June (the last date that accurate data are available), manufacturing employment growth slowed but neither state experienced the sharp downturns apparent in the preliminary data. Through June, using more accurate data results in an estimate of an additional 11,000 manufacturing jobs in Pennsylvania and an additional 8,700 manufacturing jobs in Wisconsin.

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\* I thank Junjie Guo for helpful assistance. The views expressed herein are those of the authors and not necessarily those of the Center for Research on the Wisconsin Economy, the Department of Economics, or the University of Wisconsin.

## 1 Overview

Nationwide there has been a slowdown in manufacturing employment in 2019, and the decline seemed to be especially strong in Pennsylvania and Wisconsin. Since these manufacturing-heavy states are politically sensitive, and were key to President Trump's election in 2016, this slowdown has attracted significant attention. A number of press reports, including some that I have contributed to, have reported on and delved into the factors behind the sharp declines in manufacturing in these states, with particular focus on the ongoing trade disputes and tariffs manufacturers have faced on both their inputs (particularly aluminum and steel) and on their exports (particularly to China).<sup>1</sup>

However all of these reports were based on the employment estimates from the Bureau of Labor Statistics Current Employment Survey (CES), which appear to be inaccurate. While the CES provides timely data that is valuable in gauging the current state of the economy, it is based on a survey and so are subject to error. At a national level, these errors are typically small, even when looking at slices of the economy like the manufacturing sector. However once we look at the state and industry level, the surveys are based on much smaller samples and so are much less accurate. A more complete picture of the economy is provided by the Quarterly Census of Employment and Wages (QCEW), which provides a complete count of employment from all establishments that report to unemployment insurance programs, and thus covers about 97% of all civilian wage and salary employment in the US.<sup>2</sup> The CES data are benchmarked annually to the QCEW data and are revised as the more accurate QCEW data become available. This means that current year's CES data are subject to revisions which can be quite substantial, particularly at the state-industry level.

As the QCEW data has come in this year -- it is now available through June 2019 -- it appears that the CES data has dramatically overstated the manufacturing slowdowns in Pennsylvania and Wisconsin. While the CES data shows Pennsylvania and Wisconsin experiencing declines in manufacturing employment, the QCEW data suggests that manufacturing employment growth in both states slowed in the first half of 2019, much as it did nationally. But, at least through June, neither state experienced the sharp recessions apparent in the CES data. The trade frictions and the slowing global economy have led to a slowdown in manufacturing employment, but the slowdown does not appear particularly acute in Pennsylvania and Wisconsin.

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<sup>1</sup> See <https://www.axios.com/swing-states-wisconsin-pennsylvania-manufacturing-job-loss-2690bafc-6c67-47ac-b4dc-8395976eac99.html>, <https://www.cnbc.com/2019/11/05/manufacturers-struggle-in-rust-belt-regions-that-helped-trump-win.html>, <https://www.nbcnews.com/business/economy/massive-pennsylvania-factory-layoff-foreshadows-trump-2020-troubles-n1069341>, <https://www.wpr.org/preliminary-jobs-numbers-cause-concern-wisconsins-manufacturing-industry> and [https://madison.com/wsj/business/uncertainty-growing-in-wisconsin-s-manufacturing-sector-as-survey-finds/article\\_78849364-e609-56fe-ad4c-8f6dded3e330.html?utm\\_medium=social&utm\\_source=twitter&utm\\_campaign=user-share](https://madison.com/wsj/business/uncertainty-growing-in-wisconsin-s-manufacturing-sector-as-survey-finds/article_78849364-e609-56fe-ad4c-8f6dded3e330.html?utm_medium=social&utm_source=twitter&utm_campaign=user-share) among others.

<sup>2</sup> See: <https://www.bls.gov/cew/questions-and-answers.htm>, <https://www.bls.gov/sae/home.htm>, and <https://www.bls.gov/web/empsit/cesfaq.htm> for discussions.

## Faulty Data and the Manufacturing Recession PA and WI

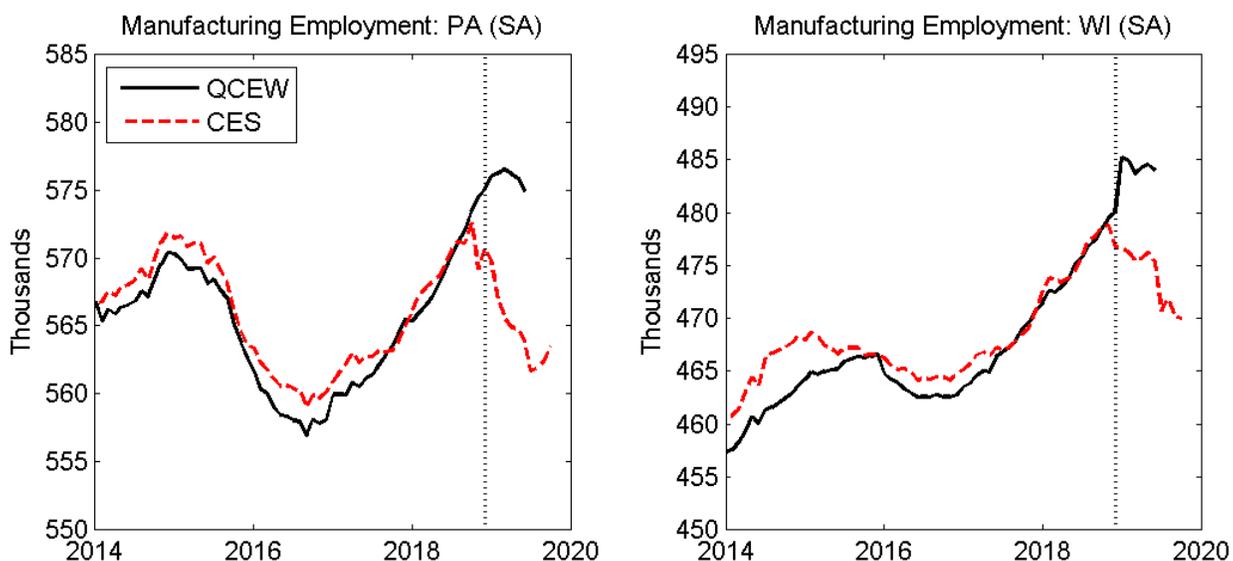


Figure 1: Manufacturing employment in Pennsylvania and Wisconsin according to the CES and QCEW data releases. Seasonally adjusted by the author. The dotted line is December 2018.

The key comparison is shown in Figure 1, which plots seasonally adjusted manufacturing employment in Pennsylvania (left panel) and Wisconsin (right panel), using both the CES data (dashed red lines, available through October) and the QCEW data (solid red lines, available through June). While the CES official release includes both seasonally adjusted (SA) and not seasonally adjusted (NSA) data, the official QCEW data is not seasonally adjusted. To put both data sources on the same footing, I applied an X13 seasonal adjustment to both NSA series, which resulted in only minor differences from the official CES SA release (due to slight differences in the official filter).

In both states the two data series track each other reasonably closely through the end of 2018. As will be more clear below, this is due to the NSA data being benchmarked and revised to closely match each other through that date. However the picture in 2019 looks quite different. The CES data in both states shows a sharp slowdown starting at the end of 2018 and continuing throughout the year, which prompted the media reports discussed above. However the QCEW data shows strong growth from the end of 2018 until the first quarter of 2019, with employment flattening out (in Wisconsin) or declining very slightly (in Pennsylvania) at the tail end. As I show below, manufacturing employment in these states has roughly followed the national trend of slowing and flattening out, but not plummeting as the CES data suggests. Through June, the differences amount to an additional 11,000 manufacturing jobs in Pennsylvania and 8,700 in Wisconsin. I expect the CES data will later be revised up in both states.

## Faulty Data and the Manufacturing Recession PA and WI

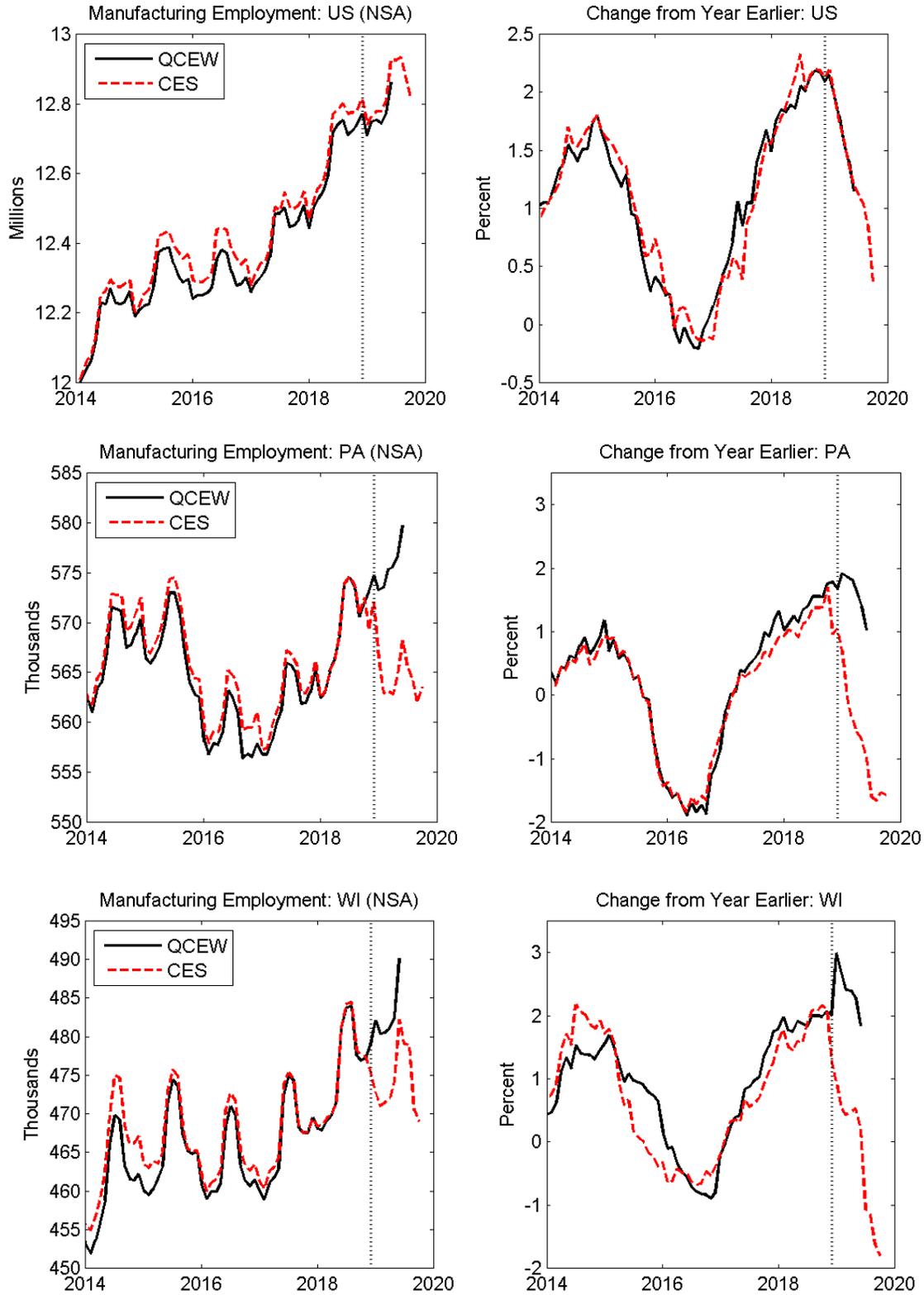


Figure 2: Manufacturing employment nationally (top row), in Pennsylvania (middle row) and Wisconsin (bottom row) from the QCEW (black) and CES (red). All are not seasonally adjusted. The left column shows levels, right column shows the percentage change from a year earlier.

## 2. More Background

In the following I work directly with the official NSA data from the QCEW and CES, making the differences in 2019 readily apparent. The results are summarized in Figure 2, which plots manufacturing employment nationally as well as in Pennsylvania and Wisconsin using the official NSA data from the QCEW and CES. The figure also shows the percentage changes in employment from a year earlier for each of the data series.

The figure shows that the CES data is quite accurate nationwide, as the series closely matches the QCEW, particularly in its trends. There appears to be a small discrepancy between the two data sources, but this is roughly constant so that the growth rates closely track each other. However the pictures look very different for Pennsylvania and Wisconsin. In both cases the NSA levels of the data closely track each other through 2018 but then sharply diverge in 2019. The benchmarking of the revised CES data is especially apparent for data from mid-2017 through 2018 as the series are nearly identical. However in 2019 the series look quite different: in each case the QCEW data continues to rise through 2019 but falls sharply, especially at the beginning of the year in the CES data. Thus the growth rates decline sharply in both states and turn negative by the end of the data series. However while there was a slowdown in the year-over-year growth rates in both states in the QCEW data, growth remained positive at 1.0% in Pennsylvania and 1.8% in Wisconsin through June. These falling but positive growth rates are consistent with the flattening out of manufacturing employment in the states.

Figure 3 shows the differences in interpretation which result from the CES data and the QCEW data. Looking at annual growth rates, the CES data shows that Pennsylvania and Wisconsin slowed much more than nationally. However the QCEW data shows that the slowing in 2019 was very similar in both states and the nation.

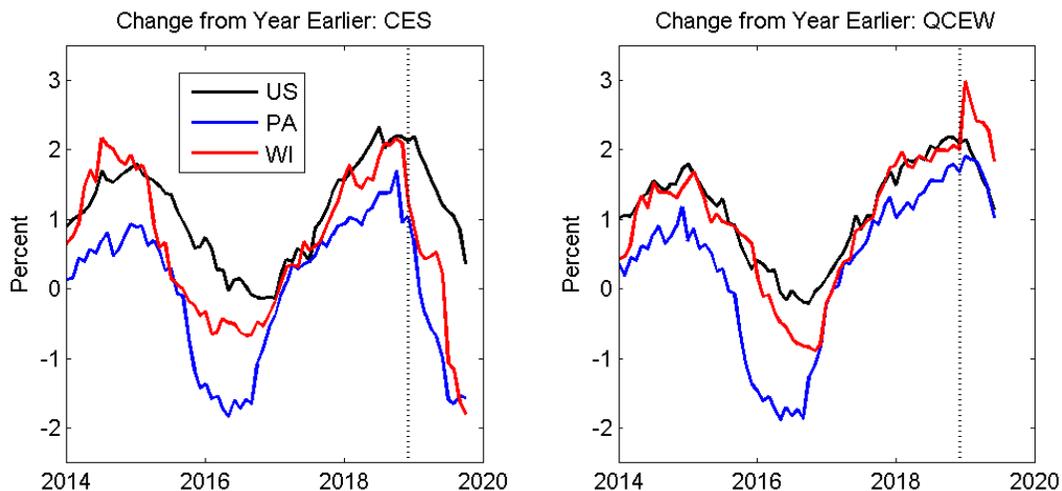


Figure 3: Percentage change in manufacturing employment growth in the US (black), Pennsylvania (blue) and Wisconsin (red) using the CES (left panel) and QCEW (right panel).

## Faulty Data and the Manufacturing Recession PA and WI

While the Pennsylvania and Wisconsin CES manufacturing employment estimates seem to be inaccurate, that is not true for all states. For some states it lines up quite well with the QCEW, like Ohio which is shown in Figure 4 below. Throughout the sample the QCEW and CES data are quite close, and they show that manufacturing employment growth slowed from the end of 2018 through 2019, with employment leveling off before declining slightly in the last couple of months. As we've seen, this is roughly the same pattern as in the nation as a whole.

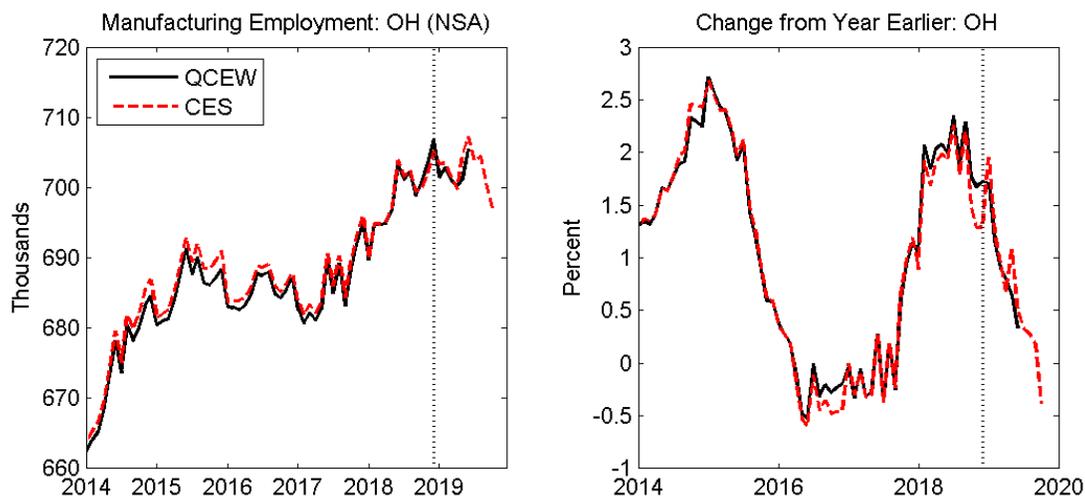


Figure 4: Manufacturing employment in Ohio from the QCEW (black) and CES (red), not seasonally adjusted. The left panel shows levels, right panel shows the percentage change from a year earlier.

The preliminary CES data is a noisy estimate, and the QCEW (although still preliminary) provides a more complete picture of the labor market. The CES is valuable because it provides more timely feedback on the state of the economy than the QCEW, which is only released after a significant lag. But especially for smaller samples like the state-industry level, the preliminary estimates may have sizeable errors and so should be used with caution. As I've shown, the CES estimates for Wisconsin and Pennsylvania, which suggested steep manufacturing employment declines, seem to have missed the mark.