Community Economic Development

Patterns in Wisconsin Manufacturing: Employment and Automation

Manufacturing as a source of employment in Wisconsin has been declining over the last several years. This decline is particularly noticeable in the rural areas of Wisconsin. These declines can be attributed to many factors ranging from a shift from a goods consuming economy to a service consuming one to labor intensive industries moving over-seas seeking cheaper labor to automation where technology is used in place of labor. A recent study by Frey and Osborne (2017) suggests that the trend toward the adoption of new technologies in the form of automation may be the greatest threat to manufacturing employment.

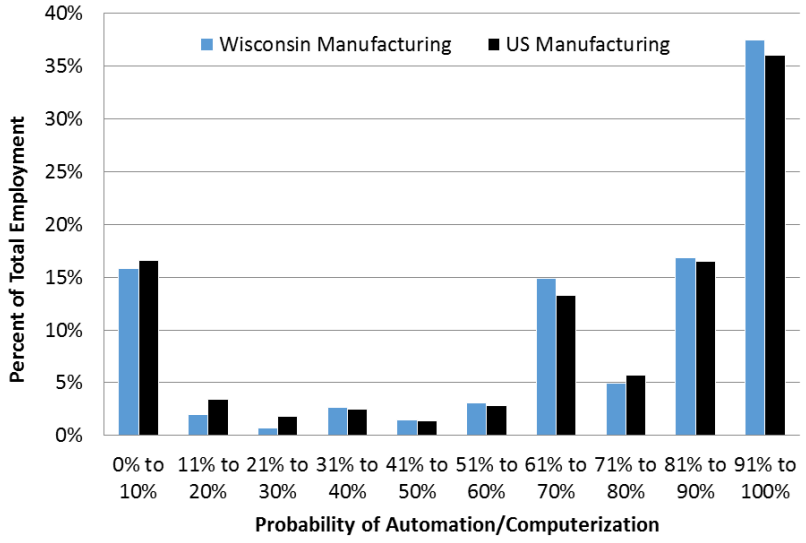
… almost 70% of employment in the Wisconsin manufacturing sector has an automation probability of 60% or higher…. over 37% of Wisconsin's manufacturing sector employment has an automation probability of 91% or higher…

Certainly employees both locally and nationally face a risk for automation, but Wisconsin's overall manufacturing industry may have a somewhat greater susceptibility. Based on the Frey and Osborne probabilities, almost 70% of employment in the manufacturing sector has an automation probability of 60% or higher (Figure 1). Furthermore, over 37% of Wisconsin's manufacturing sector employment has an automation probability of 91% or higher. With the exception of paper manufacturing, the high probability of automation is also found among Wisconsin's six largest manufacturing subsectors.

When considering the probability of automation by individual occupations within the manufacturing sector, some of the industry's most numerous occupations have a high probability of automation (Table 1). The largest single manufacturing occupation in Wisconsin is "team

If all the jobs in Wisconsin manufacturing that have a potential to be automated are indeed automated, could result in a reduction of 187,000 jobs or 73% of total manufacturing employment.

Figure 1 - Distribution of Employment by Probability of Automation/Computerization



WISCONSIN UNIVERSITY OF WISCONSIN–MADISON

DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS
CENTER FOR COMMUNITY AND ECONOMIC DEVELOPMENT
ECONOMIC DEVELOPMENT ADMINISTRATION, UNIVERSITY CENTER

UW Extension Cooperative Extension

assemblers" accounts for just over 32,000 jobs. Based on the analysis of Frey and Osborne there is a 97% probability of these jobs being replaced by automation.

While numerous occupations in the manufacturing are at risk for automation at some point, there is no way of knowing how many jobs will actually become automated.

What is important to note, beyond the potential to loose a large number of manufacturing jobs to automation, is the shift in the education and skill sets required. Many of the occupations that are most at risk, such as assemblers and labors, tend to require modest levels of formal education. But occupations that require higher education and skill sets such as engineers and managers, are less likely to be automated. This shift to greater levels of automation may replace one type of job but at the same time will create new types of jobs. The number of workers requiring more formal education and training in STEM related fields including computer sciences and engineering. The level of education and training may not require a Bachelor's Degree but an Associates Degree in STEM fields may become necessary to modern manufacturing.

Table 1: Wisconsin Manufacturing Occupation Employment and Probability of Automation

Occupation Title	Total Employment	Probability of Automation	Annual Average Salary
Team Assemblers	32,310	97.0%	$33,200
First-Line Supervisors of Production and Operating Workers	19,760	1.6%	$58,420
Laborers and Freight, Stock, and Material Movers, Hand	14,770	85.0%	$32,580
Machinists	13,080	65.0%	$42,280
Welders, Cutters, Solderers, and Brazers	13,010	94.0%	$41,600
Packaging and Filling Machine Operators and Tenders	11,860	98.0%	$33,700
Inspectors, Testers, Sorters, Samplers, and Weighers	11,340	98.0%	$39,660
Computer-Controlled Machine Tool Operators, Metal & Plastic	10,220	86.0%	$42,210
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	10,180	85.0%	$70,200
Maintenance and Repair Workers, General	8,920	64.0%	$44,600
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	8,790	78.0%	$36,710
Paper Goods Machine Setters, Operators, and Tenders	8,580	67.0%	$40,790
Electrical and Electronic Equipment Assemblers	8,360	95.0%	$32,750
Food Batchmakers	8,240	70.0%	$36,010
Office Clerks, General	7,810	96.0%	$35,370
Helpers--Production Workers	7,750	66.0%	$30,790
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	7,500	91.0%	$36,150
Mechanical Engineers	7,340	1.1%	$74,470
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	7,290	95.0%	$34,390
Shipping, Receiving, and Traffic Clerks	6,970	98.0%	$36,180
Customer Service Representatives	6,900	55.0%	$38,990
Industrial Machinery Mechanics	6,790	67.0%	$49,860
Packers and Packagers, Hand	6,750	38.0%	$28,700
Printing Press Operators	6,750	83.0%	$39,020
Industrial Engineers	6,720	2.9%	$74,670

Based on predictions by Frey and Osborne (2017)

References: Frey, Carl Benedikt, and Michael A. Osborne. "The future of employment: how susceptible are jobs to computerisation?." *Technological Forecasting and Social Change* 114 (2017): 254-280.

Authors: Tessa Conroy, Matt Kures, Steven Deller and I-Chun Chen, Department of Agricultural and Applied Economics and the Center for Community and Economic Development, University of Wisconsin—Madison/Extension.