Introduction
Automation is defined as “the use of largely automatic equipment in a system of manufacturing or other production process” (Google.com, 2015). Automation, by definition, implies a reduced role for human beings in the production process. Academics, authors, and futurists have famously speculated on the long-term economic and social impacts of automation. Writing during the depths of the Great Depression, John Maynard Keynes presented an optimistic view, predicting that technical improvements in production would lead to a significant rise in standards of living over the next one-hundred years. In addition, Keynes conjectured that most laborers would work only fifteen hours per week and that the main societal challenge would be how to make the best use of the extra leisure time (Keynes, 1930). In the novel, Player Piano, Kurt Vonnegut portrayed a future where engineers and managers dominate political and economic life after mechanization replaced the need for most workers. In his critique of modern industrial life, Vonnegut pointed to the sense of purposelessness and alienation resulting from an absence of a work life (Vonnegut, 1952). Karl Marx theorized that labor-saving technical change would create a “reserved army of the unemployed,” thereby leading to the increasing immiseration of the working class. Only after an overthrow of the capitalist system would workers be able to share in the fruits of the technological advances implemented by capitalists (Mokyr, et al., 2015, 32).

As the late, great Yogi Berra once said, “the future ain’t what it used to be.” History is usually unkind to prognosticators and the above examples are no exception. While Keynes was “spot on” regarding rising standards of living, his prediction of three hour workdays certainly wasn’t. Marx’s prophetic claims of chronic unemployment because of automation were spectacularly wrong. It seems that Kurt Vonnegut’s fears of a world without work were unfounded after all. The historical record indicates that the widespread adoption of laborsaving technology has actually increased aggregate employment in the long-run. What these new technologies do is displace workers, forcing them to find alternative ways to make a living, often at lower pay. The human costs of these disruptions are often quite significant.

This report summarizes the impact of automation on the composition of occupational employment in the United States over the last three decades. Automation over this period consisted largely of computer-based information and communication technologies (ICT) and robotics. Investments in these technologies have increased significantly over the last half-century. “The share of information processing equipment and software in private, non-residential investment rose from approximately 8 percent to more than 30 percent between 1950 and 2012, with the largest leap occurring between 1990 and 2000” (Autor, 2014, 1). We begin by looking at the historical record in assessing the effects of automation on aggregate employment. Next, we examine how automation has contributed to job polarization in the United States over the last 35 years. Specifically, automation has reduced the number of “middle skill” jobs while bolstering the number of both low- and high-skilled jobs. Then we compare and contrast the evolving employment situation in both Wisconsin and Central Wisconsin to national trends. In addition, we speculate on the potential impact of recent automation and more sophisticated forms of artificial intelligence. Lastly, we conclude with a discussion about the societal challenges and policy implications posed by automation of the manufacturing sector.

Automation and Technological Unemployment
In describing the economic effects of automation on the labor force, social commentators tend to focus on how technologies take over tasks traditionally performed by workers. While the adoption of these devices displaces certain kinds of workers, understanding their impact on aggregate employment requires a more robust economic analysis. Economic historians have shown that, in prior eras, automation has contributed to long-term increases in employment and higher standards of living. Here, we take a brief look at the historical experience of the textile industry during the British industrial revolution in the 19th century.
Innovations such as the power loom and spinning jenny in the 18th century transformed the production of textiles, ultimately leading to the relocation of production from households to factories. By doing tasks normally done by weavers, the power loom effectively reduced 98 percent of the labor needed in weaving a yard of cloth (Bessen, 2015). The “invention of the power loom in 1787 increased productivity over the hand loom not only because it could weave faster (by the mid-1820s, at any rate) but because a single person, who was no longer providing the motive power, could operate more than one loom” (Langlois, 2003, 175). The Luddites, a group of handloom weavers, famously destroyed a number of these machines to protest the increased use of the power loom.

While Karl Marx focused on the dislocation of weavers and spinners during this period, he failed to appreciate the impact of automation on the demand for other activities connected with the production of cloth. In other words, automation substitutes for work performed by some laborers and simultaneously complements the skills of others. The introduction of the power loom and spinning jenny, for example, spurred an increase in the demand for labor, particularly for “mechanics to fix new machines . . . supervisors to oversee the new factory system and accountants to manage enterprises operating on an unprecedented scale” (Mokyr et al., 2015, 36). In addition, automation led to labor shortages of highly skilled workers needed to operate these new machines. Workers responsible for tending the power loom, for example, performed a greater number of tasks than workers operating handlooms (Langlois, 2003, 175). In the event that newly created occupations are novel and more complex, then labor markets will likely lack the appropriately skilled workers required to fill these positions. This certainly was true when power looms were initially introduced in the 1800s (Bessen, 2015, 19).

Economic historians have identified a number of secondary effects of technological innovation on employment. The productivity gains in the production of textiles ultimately translated into lower cloth prices for consumers. The increase in purchasing power attributed to lower prices allowed consumers to purchase, among other products, more clothes, and subsequently bolstered employment not only in the textile industry but also in the aggregate economy (Bessen, 2015). Machine shops that initially specialized in the production and repair of textile equipment eventually evolved into a machine tool sector that further supported growth in other emerging industries like firearms, locomotives, farm machinery, and sewing machines (Rosenberg, 1963). “[T]echnological progress also took the form of product innovation and thus created entirely new sectors for the economy…” (Mokyr et al., 2015, 36).

Alternatively, suppose we look at the growth of automated teller machines (ATMs) and changes in the number of bank tellers over the last forty years. At first, one might expect that the automation of bank transactions would have a direct and negative effect on the number of bank tellers. The figure below tells a different story: observe that both the number of ATMs and the number of bank tellers have increased during the period.

![Figure 1](image_url)

**Figure 1**
Bank Tellers vs. ATMs in the U.S. (in thousands)

Given the similarities between the services provided by ATMs and bank tellers, this result seems paradoxical. There are however a number of explanations as to why ATMs failed to reduce the number of bank tellers. ATMs, for example, are unable to handle certain small business transactions that often entail large amounts of cash so there is still a need for bank tellers. ATMs, however, have effectively reduced the number of employees needed to operate a branch. With ATMs freeing up labor, banks have increasingly involved their tellers in tasks that go beyond just processing transactions; tellers as part of a bank’s customer service team, are now actively involved in sale activities (Bessen, 2015, 107). Therefore, ATMs incentivized banks to open more branches by reducing branch-banking costs. Largely because ATMs increased the demand for other branch services, this period witnessed a dramatic expansion in the number of bank branches. In the long-run, “[t]he number of urban commercial bank branches increased 43 percent between 1988 and 2004, offsetting the decrease in employees per branch” (Bessen, 2015, 107).

The belief that technological progress leads to a
reduction in aggregate employment is known to economists as the “lump of labor” fallacy. This kind of thinking presumes that the amount of work is fixed and therefore, in terms of its effect on employment, technological progress is essentially a zero sum game (Autor, 2014, 2). In this sense it is important to remember that we live in a dynamic and innovative society wherein many of today’s products (smartphones, electric cars, & Facebook) and jobs (mobile app developer, social media manager, admissions consultant, & market researcher data miner) simply did not exist fifteen years ago (Casserly, 2012).

**Automation and Labor Market Polarization**

In this section, we evaluate the impact of technological investments on occupational employment. As shown below, the amount of investment in information technologies and software (as measured as the percent of GDP) dramatically increased during the last half of 20th century, peaking at the height of the dot.com bubble in 2000.

**Figure 2**

Private Fixed Investment in Information Processing Equipment and Software as a Percentage of Gross Domestic Product, 1949–2014

![Graph showing private fixed investment in information processing equipment and software as a percentage of Gross Domestic Product, 1949-2014.]

However, history indicates that automation has not reduced overall employment, but rather, by substituting for some workers’ tasks and by complementing other workers’ tasks, it has altered the composition of employment. In evaluating the changing division of work between machines and humans, it is important “to understand the different cognitive structures of humans and machines (including computers)” (Langlois, 2003, 167). Humans have a comparative advantage over machines in the “exercise of judgment in situations of ambiguity and surprise to more mundane abilities in spatio-temporal perception and locomotion.” (Langlois, 2003, 167). Advances in computers and robotics have led to the creation of machines that have a comparative advantage in completing explicit and well-defined, sequential tasks. In other words, computers excel at following rules or algorithms. Economist David Autor describes the combined effects of these comparative advantages on labor markets.

Human tasks that have proved most amenable to computerization are those that follow explicit, codifiable procedures – such as multiplication – where computers now vastly exceed human labor in speed, quality, accuracy, and cost efficiencies. Tasks that have proved most vexing to automate are those that demand flexibility, judgment, and common sense – skills that we understand only tacitly – for example developing a hypothesis or organizing a closet. The interplay between machine and human comparative advantage allows computers to substitute for workers in performing routine, codifiable tasks while amplifying the comparative advantage of workers in supplying problem solving skills, adaptability, and creativity. Understanding the interplay is central to interpreting and forecasting the changing structure of employment in the U.S. and other industrialized countries (Autor, 2014, 1).

In empirically testing the effects of automation on the occupational structure of the US labor market, David Autor (2015) uses Census data in tracking the percent change in employment for ten major occupational categories by decade. On the chart below, the ten occupational groups are located on the horizontal axis with low-skilled occupations on the left (personal care, food/cleaning, protective services), middle-skilled occupations (operators/laborers, production, office/administrative, & sales) in the middle, and high-skilled occupations on the right (technicians, professionals, & managers). The vertical axis shows the percent change in employment for each occupational group for the periods 1979-89, 1989-99, 1999-2007, and 2007-12. (Taking the log change in employment and multiplying by 100 is a method economists employ in estimating percentage changes).

The following chart indicates that “the rapid employment growth in both high- and low-education jobs has substantially reduced the share of employment accounted for by ‘middle-skill’ jobs. In 1979, the four middle-skilled occupations accounted for 60 percent of employment. In 2007, this number was 49 percent, and in 2012, it was 46 percent” (Autor, 2015, 14). Other industrialized nations also
experienced a similar degree of job polarization over the period.

**Figure 3**

The growth of both high- and low-skilled jobs combined with the relative decline of middle-skilled jobs reflects the disparate impact of automation on employment. Low-skilled manual jobs that comprise food preparation, cleaning services, security guards, and personal care occupations require “situational adaptability, visual, and language recognition, and in-person interactions” and are therefore hard to automate (Autor, 2015, 12). Technicians, professionals and managers are high-skilled occupations that require communication skills, creativity, critical reasoning, and problem-solving capabilities. The abstract tasks required in these occupations are, thus far, difficult to automate.

As the costs of computing have declined over time, information and communication technologies increasingly have been substituted for labor in “performing routine tasks – such as bookkeeping, clerical work, and repetitive production and monitoring activities – which are readily computerized because they follow precise, well-defined procedures in the middle of the occupation skill and wage distribution” (Autor and Dorn, 2013, 1559). As shown in the previous chart, these middle-skilled occupations faced relative declines in employment over the last 35 years.

Information technology complemented workers who perform abstract tasks thereby increasing the growth of high-skill jobs, especially between 1979 and 1999. “By dramatically lowering the cost and increasing the scope of information and analysis available to them, computerization enables workers performing abstract tasks to further specialize in their area of comparative advantage, with less time spent on acquiring and crunching information, and more time spent on interpreting and applying it” (Autor, 2015, 15). These complementarities, however, were not responsible for the significant growth of low-skill, labor-intensive jobs whose share of total labor hours increased by 30 percent between 1980 and 2005. Computer-based technologies have had little impact, positive or negative, on the tasks associated with these kinds of positions. The growth in low-skill jobs is largely attributed to displaced workers moving from middle-income manufacturing to low-income service occupations. The manual tasks of service occupations require a high degree of physical flexibility and are therefore less amenable to computerization (Autor and Dorn, 2013).

The figure above shows that the growth in high-skilled positions fell dramatically since 2000. MIT economist, David Autor, largely attributes this slowdown to the parallel decline in investment in computer technologies following the bursting of the dot.com bubble in 2000 and the financial crisis in 2008. Autor also points to rapid globalization and the emergence of China’s manufacturing sector as economic factors that have contributed to job polarization, recognizing that advances in automation and information technologies have made it easier for firms to outsource production to other nations (Autor, 2015, 22).

**The Wisconsin Experience**

In contrast to the previous section, we evaluate the impact of automation on the relative changes in occupational employment measured as a share of total nonagricultural employment. Within a region, the occupational share of employment equals the ratio of the job count in a specific occupation to the aggregate number of jobs. In other words, our approach studies the occupational mix of the Wisconsin and Central Wisconsin labor sheds while internalizing the random fluctuations in the size of the labor sheds. The occupational employment procedures are otherwise identical to Autor (2015).

Figure 4 plots the percent change in the occupational shares of total non-farm employment approximated by the log difference times 100. Again, this is a method to estimate percentage changes. The three left columns are low-skill and low-pay occupations whereas the right three columns are the high-skill and high-pay occupations. Lastly, the middle four columns are middle-skill and subsequently middle-pay jobs. The figure below illustrates a pattern, similar to the national trend, of labor market polarization for the state of Wisconsin.
In evaluating the scope of labor market polarization, our analysis now shifts its focus to the employment situation in Central Wisconsin. The Central Wisconsin region includes the following counties: most notably Portage, Marathon, and Wood as well as Juneau and Adams to the south and Forest, Langlade, Lincoln, Oneida, and Vilas to the north. The construction of Figure 5 is identical to the previous figure.

The figure above continues to depict a pattern of labor market polarization in Central Wisconsin that is similar to the state and national trends. However, the growth rates appear to be increasingly volatile as the geographic scope of the analysis narrows. This is consistent with the notion that local market outcomes are, perhaps, more sensitive to randomness attributed to factors such as industry mix, public policy, and the regional economic environment.

In summary, both Figure 4 and Figure 5 suggest the share of middle-skill jobs is contracting while the low-skill and high-skill occupations account for larger shares of those employed. The most striking difference between the experiences in Wisconsin and Central Wisconsin relative to the national trend is significant reduction in certain occupations related to the manufacturing sector such as Operators, Laborers, and Production. This significant change in the composition of the state and regional employment base is almost certainly tied to the initial high concentration of manufacturing in the region relative to the national average.

Algorithm and Blues?

In his 1960 essay “The Corporation: Will It Be Managed by Machines?,” Nobel-prize winning economist, Herbert Simon, boldly predicted that, in addition to replacing clerical and blue-collar jobs, automation would eventually substitute for higher-skilled, managerial jobs (Simon, 1960). Fifty five years later, the exponential growth in computation power, digitization, data storage, and computer performance is spawning innovations that can perform the abstract tasks of many high-skilled workers and the manual, sensimotor tasks of many low-skilled workers (Brynjolfsson and McAfee, 2015). Unlike traditional computer-based technologies, these new machines are capable of learning. Economists Carl Frey and Michael Osborne explain:

While computerization has been historically confined to routine tasks involving explicit rule-based activities, algorithms for big data are now entering domains reliant upon pattern recognition and can readily substitute for labor in a wide range of non-routine cognitive tasks. In addition, advanced robots are gaining enhanced senses and dexterity, allowing them to perform a broader scope of manual tasks. This is likely to change the nature of work across industries and occupations (Frey and Osborne, 2013, 44).

IBM’s Watson, which defeated human rivals in Jeopardy, and Google’s autonomous, self-driving cars are perhaps the most famous examples of these new machines. There are, however, other examples of practical business applications being employed today. Below are just a few.

- “On-line investment services that provide automated, algorithm-based portfolio management advice have attracted millions
of investors over the past few years with low fees and minimum requirements. The so-called robo-advisors had an estimated $8 billion in assets under management as of July, a 34 percent increase from last year” (Anderson, 2015, 1)

• The company, Narrative Science, has created software capable of writing stories based upon data and other objective information. Their StatsMonkey program, for example, can produce short articles covering sporting events, using statistics as their source material. Forbes currently uses Narrative Science’s technology to compose articles covering business, political, and sports topics (Ford, 2015, 84).
• Aethon, Inc. leases mobile robots to hospitals for delivery purposes. These machines “cruise the hallways in huge medical complexes delivering drugs, lab samples, patient meals, or fresh linens. The robots can navigate around obstacles and use elevators” (Ford, 2015, 154). By leasing 19 delivery robots in lieu of hiring workers, a California hospital estimated that it saves over $650,000 annually (Ford, 2015, 154).

Frey and Osborne (2013) estimate the probability of computerization of tasks for 702 occupation categories for the near future. The authors predict that 47% of job categories will be highly susceptible to automation over the next two decades. They stress that their analysis is based solely on the capabilities of computer-based technologies with respect to the tasks they are expected to perform; they do not predict which occupations will be automated (Frey and Osborne, 2013, 44). The decision to automate is an economic one based on numerous factors including relative labor and capital costs and the availability of complementary inputs and services.

According to Frey and Osborne, the jobs most susceptible to automation include transportation, logistics, construction, office, administrative support and labor in production occupations. In addition, robots with enhanced capabilities in mobility and dexterity will increasingly replace human workers in low-skill, service occupations, which had experienced the greatest amount of job growth over the last several decades (Frey and Osborne, 2013). Occupations least likely to be automated are ones requiring high levels of social intelligence, education, creativity, and are generalist in nature. These characteristics define most occupations in management, education, healthcare, science, engineering, and the arts. The authors find that “both wages and educational attainment exhibit a strong negative relationship with the probability of computerization” (Frey and Osborne, 2013).

Frey and Osborne (2013) and Autor (2015) see our current era of labor polarization coming to an end. Middle skill jobs like nurse technicians, electricians, plumbers, and automotive mechanics that require problem-solving, interpersonal interaction, common sense, and adaptability will likely persist and not be affected negatively by automation (Autor, 2015, 25-6). Low-wage service workers will likely bear the brunt of automation with robots increasingly substituting for low-skill, manual occupations during the next few decades (Autor, 2013).

The sobering predictions of Frey and Osborne (2013) imply rising technological unemployment, especially for low-skill service workers. In terms of the overall impact on employment, their analysis is incomplete since it focuses solely on how automation substitutes for tasks performed in these occupations. The authors do not assess how these technologies complement the skills of workers in other occupations. Unfortunately, the effects of automation on complementary tasks are harder to predict (Autor, 2015, 26). If history is any guide, technological progress will continue to increase the demand for laborers who can work in tandem with these machines. It is also hard to predict the impact of technological progress in creating new industries and jobs that currently do not exist. In their book, The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies, Economists Erik Brynjolfsson and Andrew McAfee believe that the current wave of technological advances will significantly increase the variety, quality, and quantity of goods and services, all of which will be produced at rapidly falling cost (Brynjolfsson and McAfee, 2015, 12). This economic bounty, in the long-run, will generate a dramatic expansion of employment opportunities. The challenge will be in providing displaced workers with the appropriate skills to take full advantage of these opportunities so that they are both contributing to and sharing in the economic bounty.

**Automation and Employment in the Manufacturing Sector**

Perhaps no sector of the economy better illustrates the impact of automation on employment than the manufacturing sector. The graph below shows the number of manufacturing jobs and the dollar value of manufacturing output in the United States from 1998 to 2014.
Despite manufacturing jobs declining by about a third over that time period, output increased in value from 12.5 to 19.0 trillion dollars. The productivity gains from automation mean that a lot more output can be produced with far fewer workers. The above graph clearly demonstrates how automation substitutes for the tasks of some production workers.

Another statistic reveals the impact of automation on the changing nature of work in manufacturing. According to Manpower, there were approximately 600,000 unfilled US manufacturing jobs in 2013. “Most of these jobs are for skilled production workers in roles like machinists, craft workers, distributors and technicians. These jobs require extensive training and are difficult to fill” (Davenport, 2013, 2). The high number of unfilled jobs demonstrates how automation can increase the demand for skilled workers who complement these new technologies.

In Wisconsin, the manufacturing sector employs more people than any other sector. Wisconsin “is home to 9,400 manufacturers employing over 450,000 workers, which is nearly 17% of the state’s workforce” (Schmid, 2014). The graph below shows the number of jobs and manufacturing output from 1998 to 2014 for the state of Wisconsin. Like the nation, the state has experienced a dramatic decline in the number of manufacturing jobs, though there has been a modest rebound since 2010. Except for the sharp decline in output during the great recession, manufacturing output has continued to rise despite the decrease in the number of workers.

Wisconsin manufacturers similarly have had difficulty finding qualified people to fill vacancies for high-skilled positions. For 2013, Wisconsin manufacturers “posted 891 openings for mechanical engineers ... compared to 780 openings for software developers” (Schmid, 2013).

The confluence of technological unemployment and job vacancies in the manufacturing sector poses challenges for policymakers in addressing skill mismatches. As David Autor has observed, “human capital investment must be at the heart of any long-term strategy for producing skills that are complemented by rather than substituted for technological change” (Autor, 2015, 27). Time is a major obstacle to meeting the new skill needs. There is often a significant lag between the introduction of a new technology and its widespread application. Economist James Bessen explains that “[i]t takes time for technical knowledge to be developed, longer for it to spread, and even longer for institutions to emerged, such as labor markets that allow ordinary workers to benefit from their knowledge. Such learning on a mass scale was and is a difficult problem for society” (2015, 18).

In the manufacturing sector, new technologies like computer-aided design and manufacturing (CAD/CAM), computer numerical control (CNC), and robotics are highly complex. Workers require significant amounts of training before they are able to use these technologies (Davenport, 2013a). The skills are often highly specific to a particular industry (or firm). The lack of standardization across industries has slowed the development of educational institutions that can provide comprehensive training. Businesses have taken a more fragmented approach, relying on “a combination of publicly available education (typically in community colleges or technical schools), vendor-based education and on-the-job training” (Davenport, 2013b, 2-3).
The lack of appropriate training opportunities at the technical and community college levels has forced businesses to be creative in developing their own training programs. In the Houston area, a business association backed by like Exxon, Mobil, Shell, and Chevron Phillips is training local workers technical skills for local jobs in the oil industry. Dow Chemical has implemented an apprenticeship program to train workers to run its facilities. The program costs Dow a $100,000 a participant. Over 100 firms along the Ohio-Pennsylvania border established the Oh-Penn Manufacturing Collaborative which sponsors training programs for jobs in the area’s machine-building industry (Campoy, 2015). Private efforts in addressing skilled labor shortages are often necessary given the obstacles in creating training programs on a mass scale.

In Manpower’s report, The Future of the Manufacturing Workforce, Tom Davenport describes several policy proposals designed to help fill the skills gap in manufacturing.

- **Institutionalized Funding at Many Levels:**  
  “Federal funding, whether in the U.S. or Canada, is not going to meet all needs for manufacturing-oriented education. There will have to be locally-driven stable funding for community and junior colleges and specific manufacturing programs within them if these institutions are to turn out the requisite number of trained students (Davenport, 2013c, 2-3).

- **A Greater Degree of Sharing and Coordination:**  
  Manufacturing “education programs need a better ability to share and coordinate their content – not only with each other, but vendors of manufacturing technology and the companies that apply it” (Davenport, 2013c, 3). A clearinghouse that can centralize content used in instruction would facilitate the diffusion of knowledge and help expand the number of qualified faculty.

- **Certification Programs:**  
  In addition to established programs for plumbers and electricians, there is a need for the ability to certify the skills of workers in other areas. These include “personal effectiveness competencies (showing up on time, working in teams), academic competencies (reading, writing, math), manufacturing competencies (safety, quality management) and industry-wide technical competencies (welding, machining, CNC)” (Davenport, 2013c. 3). The goal is to have community colleges and technical schools house these programs in the near future.

**Conclusion**

The current pace and scope of technological change implies a need for workers at all skill levels to update their skills throughout their working years. Unfortunately, the United States badly trails other developed economies in providing opportunities for job retraining. The United States “spends barely more than 0.1% of GDP on ‘active labor market policies’ to get the less skilled back to work, one-fifth of the OECD average” (The Economist, 2012, 24). As described in the previous section, greater support for technical and community colleges that possess specialized knowledge of the needs of local businesses can help provide workers with the appropriate training to meet those needs. As the capabilities of machines encroach on more abstract tasks, higher-skilled workers may find the need to update their skills as well. Economists Raghuram Rajan and Luigi Zingales believe that we “need more modular degrees and lifelong admission to a university (at least for the general programs) – so that the student can pick and choose what she wants and when she needs it” (Rajan and Zingales, 2003, 304).

The United States in the past has shown the willingness to make the necessary public investments to address skill shortages resulting from technological change. David Autor describes how our country responded to the human capital challenges of industrialization.

In 1900, the typical young, native-born American had only a common school education, about the equivalent of sixth to eighth grades. By the late 19th century many Americans realized that this level of schooling was inadequate: farm employment was declining, industry was rising, and their children would need additional skills to earn a living. The United States responded to the challenge over the first four decades of the 20th century by becoming the first nation in the world to deliver universal high school education to its citizens. Tellingly the high school movement was led by the farm states. Societal adjustments to earlier waves of technological development were neither rapid, automatic, nor cheap. But they did pay off handsomely (Autor, 2015, 27).

The challenges Central Wisconsin, Wisconsin, and the United States face today call for a similar kind of commitment to ensure the economic well-being of our fellow citizens.


