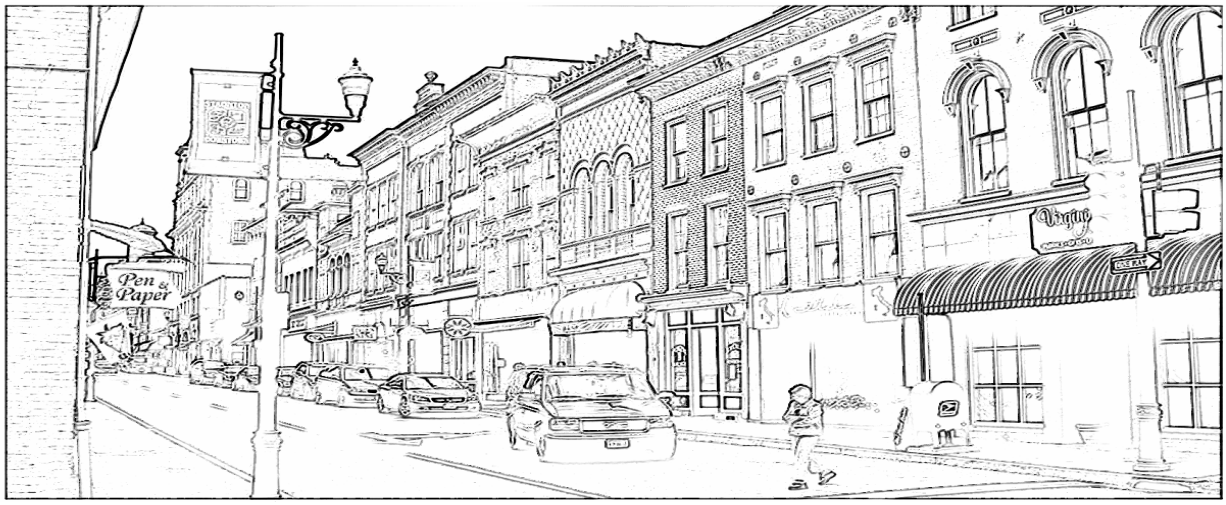


Labor Market Trends in Wisconsin:

Potential Worker Shortage and Changing Skill Demand

Tessa Conroy, Matt Kures, and Steven Deller

Department of Agricultural and Applied Economics and
Center for Community and Economic Development
University of Wisconsin-Madison/Extension

Patterns of Economic Growth and Development
Policy Brief No. 4

UW Extension
University of Wisconsin-Extension

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

Table of Contents

Key Points

- Wisconsin faces a potential labor shortage driven primarily by an aging demographic.

- As technological advancements change production, job growth is changing in a process of "job polarization." Projected job growth in Wisconsin is occurring at the high and low end of the skill distribution—jobs requiring either a high school diploma or less at one end and a bachelor's degree or higher at the other end.

- The projected job growth in Wisconsin considered alongside the education of the workforce suggests a potential skill mismatch.

    - Projected job openings requiring a high school diploma or less exceed the number of appropriately skilled workers to fill them.
    - Despite the high growth of jobs requiring a bachelor's degree or higher, there is still a shortage of jobs available relative to the number of college-educated workers.

- Wisconsinites must ask themselves if the current trajectory of job growth is desirable. Any policy option at the state-level should consider the long-term goals for the future.

Labor Market Trends in Wisconsin:
Potential Worker Shortage and Changing Skill Demand

High school graduation rates in Wisconsin are high compared to other states. Yet as students enroll in college, state-wide performance declines. At the same time, Wisconsin is experiencing negative net migration of the young and college-educated population, less so through out-migration (brain drain) but more from low levels of in-migration. As a result of the migration patterns and troubled education pipeline, Wisconsin has the least educated workforce in the region (Conroy et al. 2016). Combined, these trends suggest potential challenges to building a strong, talented labor pool in the state. This report more closely discusses the potential labor challenges in Wisconsin as they relate to industrial changes and the skill level of the work force. Particular attention is paid to policy options that can be considered at both the community and state levels.

Introduction

As the Wisconsin economy grows, it is vital that the demand and supply of labor come together to match job openings with appropriately skilled workers. Slow, stalled, or declining industrial growth can constrain job growth. Similarly, a shortage of workers can be a limitation to a growing economy. Last, a mismatch between the skills required by employers and those attained by workers can also lead to less than desirable employment outcomes.

The expected Wisconsin job growth suggests that job availability, or demand for workers, is not a constraint on economic performance in the state (WIOA Combined State Plan, 2016). Nearly all industries have positive projected employment growth through 2022. Instead, the availability of workers appears to be the more pressing issue. Demographic shifts toward an older population and narrow losses from migration are shrinking the pool of working age residents, resulting in a potential labor shortage. In addition, there appears to be a growing "skill mismatch" in that job openings do not suit skill, or education levels available in the workforce. The spatial or geographic aspect of skill and educational mismatch is also a challenge: workers with appropriate skills and/or educational levels are not located within commuting distances of employers looking to hire. The worker shortage and aspects of skill mismatch present potential obstacles to future employment growth in Wisconsin.

The perception that Wisconsin's potential labor shortage is primarily due to out-migration, often called a "brain drain," is somewhat misplaced. Indeed, negative net migration does reduce the potential labor pool in Wisconsin. The rate of people leaving Wisconsin, or out-migration, however, is relatively low compared to other states. Our analysis suggests that the more critical component is especially low in-migration. Simply put, the flow of people moving to Wisconsin is too low. The inability to effectively recruit new residents to the state is reflected in a small flow of in-migration that fails to offset the losses from out-migration. So, more than out-migration, it is low in-migration that is key to understanding the small losses due to net negative migration.

In addition to the ways the pool of available workers is changing, so too are the requirements of industries in Wisconsin. The trend toward automation is replacing workers in routine tasks across all sectors. For example, we can see this in self-checkout lanes in larger retailers and higher rates of online banking reducing the need for clerks. This trend is especially evident in manufacturing. While it is true that some jobs are lost to technological advancements, there can also be positive employment effects. As production increases in one area, the demand for people at work in the supporting tasks also increases. Supporting tasks may be those completed by highly skilled people at work in cognitive, analytical jobs. In manufacturing this can be the design, programming and maintenance of complex robotic equipment or other machinery. Supporting tasks may also be those completed by people in jobs that require some dexterity, visual and language recognition more typical of low-skill positions. Growth in these jobs at the relative extremes of the skill distribution, coupled with decline in many mid-skill jobs that can be automated, is creating "job polarization." By extension, this polarization is widening the income gap via a large gap in wages between the high and low end of the skill distribution.

As a reflection of "job polarization," the fastest growing jobs in Wisconsin are either low-skill, requiring only a high school diploma, or high skill, requiring a bachelor's degree or higher. Considering these trends in job growth against the projected skill level of the workforce reveals a potential mismatch associated with job polarization. Specifically, projections suggest there will be more openings at the low end of the skill or education distribution than workers to fill them. The opposite problem is projected at the high end of the skill or education distribution. Even though there is substantial job growth in positions requiring higher education levels, there are not enough jobs for people with higher levels of education.

> More than out-migration, it is low in-migration to Wisconsin that is key to understanding the loss of people from net negative migration.

If the vision for Wisconsin's future is one of competitive wages and innovation, then it may be necessary to consider the current trajectory of Wisconsin industry and the quality of jobs that will be created in the future. In this policy brief, we consider these labor issues in more detail, borrowing insight based on educational trends in the state reported by Conroy et al. (2016). We first focus on labor supply, then education mismatch and job polarization. We conclude with a policy discussion, which incorporates the Workforce Innovation and Opportunity Act.

Worker Shortage

Demographics

The Wisconsin Department of Workforce Development (DWD) projects a shortage of workers over the next decade primarily due to baby boomers retiring (WIOA Combined State Plan, 2016). The population is aging with the retirement age share of the population nearly doubling in size by 2040 (Egan-Roberston, 2013). All the while the working age (18-64) share of the population is shrinking. Combined, these demographic factors suggest a coming labor shortage in Wisconsin. According to DWD estimates, as many as 46,000 jobs could go unfilled in 2022 as a consequence of the labor shortage.

Migration

In addition to a changing age structure, migration also affects the pool of available workers. In Wisconsin, both in-migration and out-migration rates of the college-educated and working-age population are low compared to other states (Figures 1 and 2). Only a small share of people leaves the state in any given year. While this low rate of out-migration, particularly of the educated working age population (i.e., brain-drain) does erode the labor pool, perhaps more problematic is the even lower rate of in-migration. Out-migration by itself is not necessarily concerning if there is a sufficient offsetting flow of in-migration. Wisconsin, however, has not been able to successfully recruit residents (in-migrants) leading to negative net migration. In a sense, Wisconsin is not suffering from a brain-drain but more from the lack of brain-gain. We expect that more precise analysis would show the migration trends in Wisconsin are part of a more general rural to urban trend in the U.S., in that the out-migration from Wisconsin, a relatively rural state, flows primarily to the Twin Cities and Chicago area (Robinson et al, 2016).

Figure 1

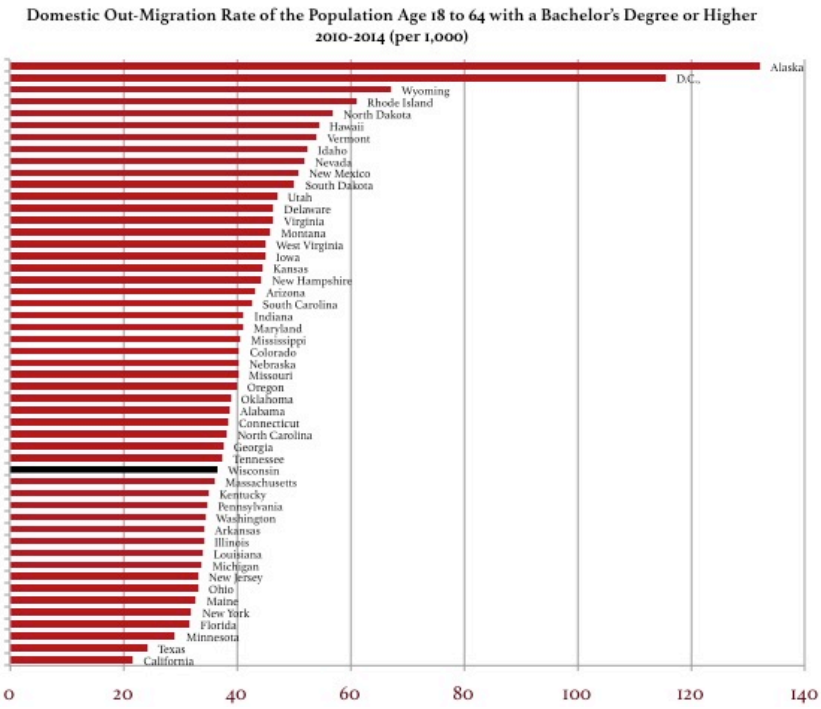
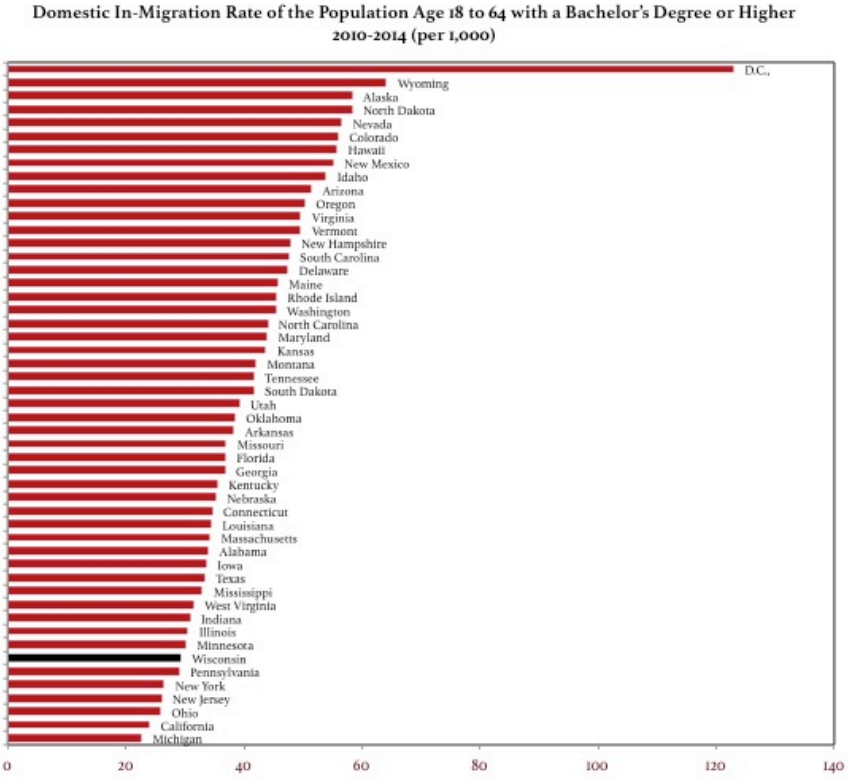
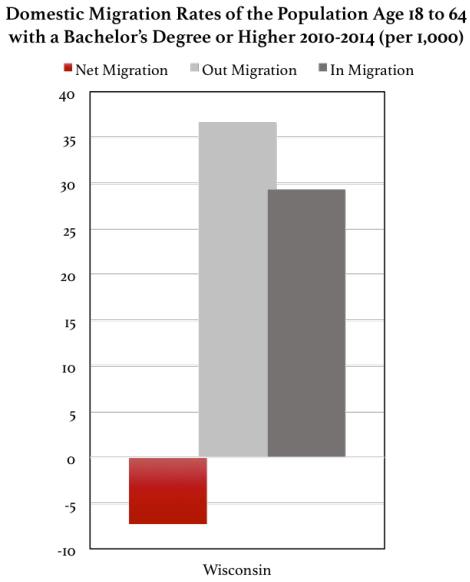


Figure 2



Though some projections show that migration trends may change in the coming decades resulting in positive net migration (Egan-Robertson 2013), those changes have yet to be seen. Unfortunately, the potential change in the labor force from a change in net migration will likely be modest. In general, people across the U.S. have become less mobile, and in Wisconsin, which already had low rates of population

Figure 3



churn, the number of movers has become smaller still. So, while we might expect positive migration in the future, the effects on labor availability will likely be small.

Skill Mismatch

In addition to the potential shortage of workers, a quantity issue, there is also a labor quality issue in the form of skill mismatch. A "skills gap" or "mismatch" occurs when despite a high number of job seekers, employers report difficulty finding appropriately skilled workers for the available positions. Such a circumstance suggests that the skill requirements of available jobs do not match those of people looking for work. Based on projections through 2022, Wisconsin faces a potential skill mismatch in that there are more jobs than workers available for low-skill positions requiring a high school diploma (Loritz et al. 2013). Conversely, there are not enough jobs for workers with a college education including associate's, bachelor's, and master's degree holders for the projected job (Loritz et al. 2013).

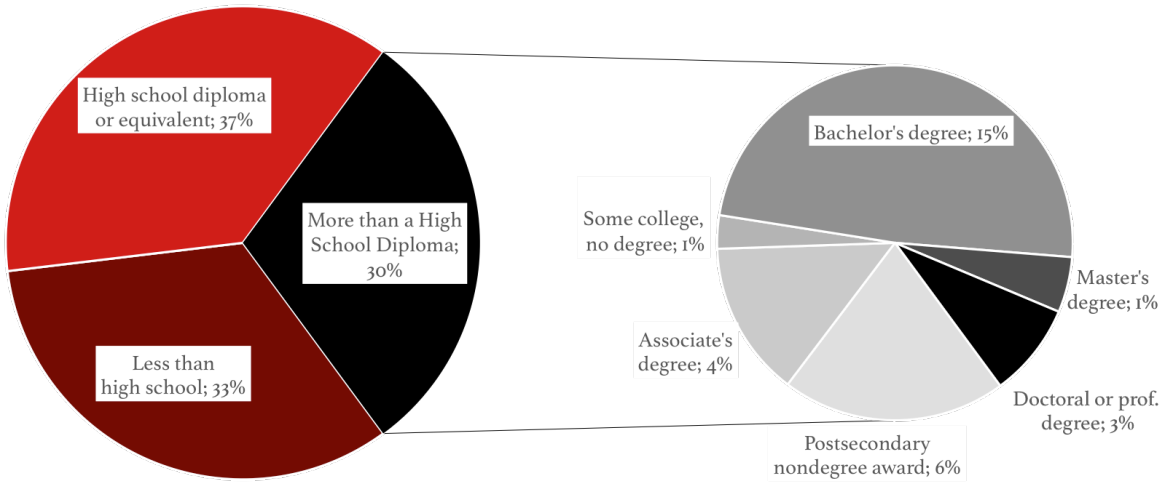
The shortage of job openings for college degree holders, may partly explain the net negative migration of the young educated workers. Without adequate employment available in Wisconsin, those with college degrees seek jobs at their skill level in other states. This trend suggests that the issue of skill mismatch is at least partly geographic. There are jobs available that require higher education, but the jobs are not in the same place as degree-holding job seekers. The distance between jobs and appropriately skilled job seekers can lead to unemployment or underemployment despite there being both job openings and workers to fill them.

The spatial mismatch also occurs in many large cities, as entry-level job opportunities are often distant from the residences of appropriately skilled workers. The spatial disconnect between inner city residential areas and suburban job opportunities can contribute to the poor employment outcomes for those living in the inner city. Milwaukee, for example, exhibits trends that correspond to geographic mismatch. First, even after accounting for several factors, Blacks in Milwaukee commute far longer to get to their jobs, which suggests they are located further from employers who are offering employment at their skill-level (Ewing, 2004). Further, there has been evidence of an oversupply of low-skill labor in the inner-city forcing low-skill workers, largely Blacks and Latinos, to commute to the suburbs for employment without any compensation via higher wages.

This geographic mismatch can also be seen in rural Wisconsin. Many larger employers located in smaller communities must draw from a very large geographic area to find a sufficient pool of workers. Given the lack of public transportation, workers are responsible for all commuting related costs. For higher paying jobs the commuting costs may be only a small factor as high wages can support the expense of the commute (a reliable car, gas,

Figure 4

Occupational Education Forecasts
2012-2022



and time) and still make the job worthwhile. For lower paying jobs, however, the costs can be more constraining because the expenses represent a larger share of income at low wage levels, reducing both the feasibility of the commute and the incentive. Consequently, fewer workers may seek lower paying jobs that require a costly commute. This latter problem can also play out in urban areas; a lack of reliable transportation for commuting purposes can limit the potential pool of labor.

Changing Industrial Needs and Job Polarization

The skill mismatch issue is further complicated by the evolving industrial profile in the state. For example, manufacturing is becoming leaner, partly as a result of automation, reducing the labor needs in Wisconsin manufacturing. In addition to leaner production and fewer jobs in affected sectors, automation is also causing the skill requirements of Wisconsin industries (such as manufacturing) to change. As an example, technological advancement may change production so that the demand for mid-skill routine assembly workers declines. In turn, these workers are replaced by employees with engineering skills required to maintain and repair the new technologies.

While machines can replace the workers in some contexts, it is also true that technology can change production in a way that increases the need for workers in other tasks. That is, in addition to labor substitution, there can also be a complementarity between workers and technology. As one step in the production process becomes more efficient, the others must also become more productive to keep up. For example, as computers more frequently read x-rays and medical images, there will likely be a greater need for surrounding tasks involving patient in-take, consultation, and subsequent

treatment. So, while some jobs will be replaced, the demand for others may increase. In a sense this shift is a reflection of transitions from a traditional goods-producing to a service-producing economy.

In addition to affecting the *number* of jobs available, the new production processes can change the *type* of jobs available. For example, jobs that require mid-skill levels are becoming fewer because they are often associated with routine tasks that can be automated. At the same time, jobs requiring high and low skill levels are growing in a process of "job polarization" (The Economist, 2016). Technology is being used to execute routine tasks, often replacing mid-level employment, but two categories of tasks have been more difficult to automate (Autor, 2015). First, tasks requiring a high level of mastery, analytical capability, and inductive reasoning that are characteristic of professional, managerial, and technical positions are difficult to replicate with technology. At the other end of the skill distribution, manual tasks such as those requiring situational adaptability, visual and language recognition, and interpersonal interaction are also less subject to automation. Consistent with the "job polarization" trend, the Bureau of Labor Statistics reports that the ten fastest growing jobs, both nationally and in the Tri-state area of Illinois, Indiana, and Wisconsin require a high school diploma or less (Robinson 2016).

Policy

Historically, employers have provided a large share of employee training. Employers provided apprenticeships, on-the-job training, and internships thus ensuring themselves a labor pool with the desired skills. Now with rapid technological advancement and globalization making it difficult to forecast their labor needs into the future, they have less incentive to provide in-house training. Part of this reluctance to invest in training is out of concern that firms will not see a return on their investment because workers may take their newly acquired skills to competitors. As a result, the task of training workers is increasingly falling on the public sector.

Today, a number of policies and organizations, not the least of which being

Wages and Inequality

Job polarization is reflected not only in the nature of the jobs being created, but also in the level of pay. An important driving factor behind the growing inequality of income distributions is this polarization of the job market. If workers could quickly move into highly educated professions, it would erode the potential earnings gain. But because many of these professions require a college, and possibly, a graduate degree, the labor supply response takes at least 4-10 years (Autor 2015). In the U.S. and especially in Wisconsin, the labor response to the education premium has been slow compared to the change in demand, particularly among males. (Autor 2015, Conroy et al 2016). So, while the stock of highly educated workers has grown, it has not grown sufficiently to keep pace with demand, which has kept wages relatively high. At the low-end of the skill spectrum, however, there is little to no lag in the supply adjustment. So, workers can transition into high demand positions more easily, thus driving down wages. The result is higher pay at high skill levels, but persistently low pay at low education levels leading to more inequality (see Appendix). *Given projected long-term growth trends, Wisconsin appears to be dominated by jobs requiring only a high school education or less. Consequently, there is a strong potential for significant growth in the "working poor".*

the educational system, are tasked with preparing workers with the skills necessary for employment. These efforts, however, are critiqued for being either ineffective or piecemeal efforts targeted at certain groups of workers or industries. The university system has also been subject to criticism as a bachelor's degree, a conventional measure of job qualification, can actually leave students underprepared (Robinson et al. 2016). More specifically, employers seek experienced workers, but most students leave college with little applied experience, perhaps because there are few opportunities for gaining experience in the university setting.

Recently, the Workforce Innovation and Opportunity Act (WIOA) was signed into Federal law. The law, which requires each state to design a workforce development plan, is designed to help job seekers find employment, as well as access education, training and support services. In turn, the WIOA also helps employers find the workers they need. The Act requires states to develop a four-year plan that strategically aligns their workforce development programs.

With WIOA as the backdrop, the Community Development and Policy Studies Division at the Federal Reserve Bank of Chicago, and the Center for Governmental Studies at Northern Illinois University (CGS) have put forth several workforce development strategies. As discussed by Robinson et al (2016) and outlined below, the policies are geared toward matching the skills of workers to the needs of industry. In Wisconsin, there are examples of different industry groups approaching the technical schools and UW to provide custom ongoing training for their workforce. For example, the Wisconsin's Plastic Valley cluster group worked with Madison College to develop an Associated Degree in plastics manufacturing. Another example is in northeastern Wisconsin where a gap in the market for people with engineering skills was identified. A group of communities formed a partnership with manufacturers in the region to work with the University of Wisconsin-Oshkosh and many sister organizations (e.g., UW-GB, UW-FD, and the technical schools, among others) to form the Engineering Technology Program Collaboration effort to help address this engineering skills gap in the labor market. Specific polies suggested by the Federal Reserve Bank of Chicago and Governmental Studies program at Northern Illinois follow.

- **Using data for workforce planning and policy.** Apply data tools and cluster analysis to policy initiatives to better align workforce and education programs with employers' needs and high-growth industries. This approach was employed to identify the shortage of workers with engineering skills in northeast Wisconsin. Some simple examples include:
    - Understanding that educational needs vary across the state and require flexible and adaptable curricula and course offerings from local schools.
    - Regular meeting between local school boards and local employers to discuss workforce needs.
    - Partnering between technical schools and university campuses to build synergies. The Engineering Technology Program Collaboration effort is an excellent example.
- **Developing educational models.** Look beyond the physical boundaries of the school to provide more practical work experiences hence exposing students to

a professional environment earlier. Some examples include:
    - Incorporating apprenticeship-style workforce preparation into high school curricula such as the apprenticeship opportunities provided through the Wisconsin Regional Training Partnership.
    - Developing mentorship programs with local small business owners.
    - Using the school as a business incubator to expose students to entrepreneurial experiences.
    - Investing in early childhood educational programs both inside and outside the local schools.
- **Accelerating the preparation of low-skill adult workers.** Providing combined educational programs for adult learners that teach both basic skills and technical/professional training.
    - Address barriers to the productivity of low-skill workers such as inadequate child care or unreliable transportation for commuting.
    - Consider entrepreneurship and small business development opportunities.
- **Assisting the chronically unemployed.** Connect non-traditional workers, such as the homeless and ex-offenders who are facing barriers to employment, with transitional jobs to help successfully move them into the workforce.
    - Make available the social services that these workers may require to be effective in the workforce such as access to mental health care or recovery treatment and support.

Central to this discussion is the type of skills that employers will require in the future. What employers require will vary significantly across the skills spectrum. Many firms will prioritize critical thinking and problem solving skills, strong communication skills, and the ability to exhibit entrepreneurial behavior as well as be an effective member of teams. Often workers will be expected to come in with versatile soft-skills and must be able to learn the specific technical skills they need within the work environment. Wisconsin's educational system must be flexible enough to provide a quality work force satisfying both ends of the spectrum.

There is also an opportunity for higher education systems to recalibrate to the needs of industry. Education investment could be central to a long-term strategy for skills that are complementary, rather than replaced by technological change. Such societal adjustments to technological change have occurred several times already in the United States. As a well-known example, in the early 20th century most American workers had only the equivalent of a sixth-to-eighth grade education. Realizing that current human capital levels were inadequate for an economy with declining farm employment and rising industrial employment, the States responded with universal high school education (Autor 2015). Today, there is a similar opportunity to adjust education to better prepare workers for success in an evolving economy.

Wisconsin should also consider approaches to attract more workers and their families to move into Wisconsin. Although the data suggest that Americans are becoming less mobile, there are opportunities for Wisconsin to gain from migration. Studies of migration have suggested that the historical pattern of "people following jobs" has shifted to "jobs

following people". There are two primary explanations for this idea. First, the economy is transitioning from larger manufacturers as the primary source of employment to a more service oriented economy. Many of these services are aimed at meeting the needs of households (e.g., personal services), thus as the population of a place increases, these types of businesses are started or move into the community. Second, people are increasingly focused on quality of life and are willing to give up some income in order to live in a preferable location

Many communities have embraced these changes and are pursuing a strategy broadly defined as "place making". Here the community makes investments to improve the overall quality of life. These investments include investing in natural amenities, street-scaping, and key public services such as fire protection and safety. Some communities have also enhanced their cultural facilities and events such as libraries and concerts, and perhaps most important, their local schools. The end goal is to make the community as attractive as possible from the perspective of residents and entrepreneurs.

The above policies for Wisconsin workforce development are generally aimed at responding to the demands of employers. Alternatively, the policy discussion centers could focus on investments aimed at shifting the nature of the industrial make-up of Wisconsin. Educational and training policies can be aimed at simply meeting the needs of current employers or those policies can be forward-looking with an eye towards workers driving industrial change. In other words, should policies be reactive to current labor demands or proactive steering the nature of that labor demand? As an example, recent work on the sources of job growth in Wisconsin revealed that new firm start-ups are vital to job growth (Conroy and Deller 2015). So, educational policy may do well to shift toward supporting the entrepreneurial stream of business start-ups rather than responding only to current employer needs.

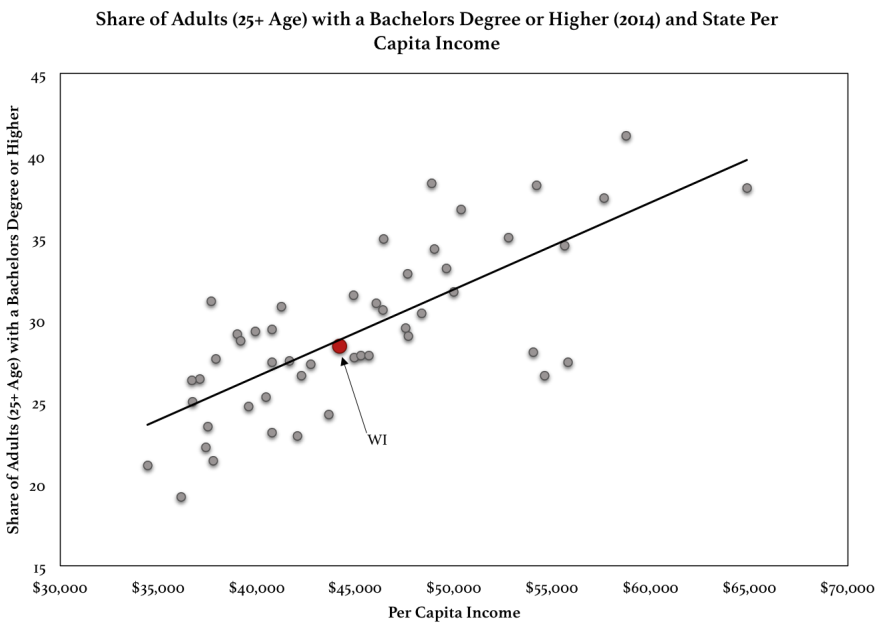
Conclusion

Changing demographics in Wisconsin combined with skill mismatch in younger cohorts could leave jobs unfilled (WIOA Combined State Plan 2016). These state-level trends combined with job polarization create several potential labor market challenges.

Wisconsin does show signs of a troubled education pipeline that has resulted in a relatively small share of the workforce that is college-educated (Conroy et al 2016). This alone may be concerning if the goal is to train workers for stable, high-paying jobs with opportunities for advancement. When this low rate of high-educational attainment is considered in light of future job opportunities, the state employment trajectory is perhaps even more grim. Occupational forecasts suggest that there will be a shortage of jobs requiring a college degree or more relative to the size of the college educated workforce. Taken together these trends suggest a future where there is a relatively small pool highly skilled workers in Wisconsin, and an even smaller pool of quality jobs for them.

In addition to the potential challenges in the highly skilled labor market, there are also challenges at the low-end of the skill distribution. A large share of future job growth is in positions that require a high school diploma or less. While job growth is generally good for an economy, job quality is also an important component of economic development. Often low-skill jobs do not feature wages, benefits, and

Figure 5



stability that are conducive to a higher quality of living. The expected large growth in employment opportunities in these lower skilled jobs could lead to a large growth in the number of the "working poor" in Wisconsin.

As job growth continues to cluster at the high and low end of the skill distribution, it is worth considering what is a desirable mix of future job offerings in the state and how it can be achieved. This analysis suggests that the state is moving toward employment growth that is heavily concentrated in low-skill jobs, so much so that there may not be enough workers to fill them. Meanwhile, there are not projected to be enough jobs for the highly educated workers in the state—a trend that may lead to higher out-migration of the young talented workers. These trends suggest, rather than evolving toward the comparatively high wages associated with a large college-educated population (Figure 5), there may be a growing class of the "working poor" within Wisconsin.

Some of the policies discussed in the previous section are targeted to accommodate low-skill job growth. These trends in employment, however, are at least partly a reflection of the industries within the state—their needs, production methods, and innovative capacity—all of which could be part of developing strategies to affect the quality of jobs in the state. Should the composition of job growth evolve toward more high-skill positions, the strategies could be adapted to better serve high skilled workers. The use of data for workforce planning, alternative and accelerated training programs, and the university system, in particular, are all well-suited for workforce training, resources, and policies for the benefit of high skilled workers.

Should Wisconsin educational policies be focusing on meeting the demand of today's industries or be structured to drive the nature of Wisconsin's future industries?

In the end, the ultimate goal of Wisconsin's educational policies as it related to labor force preparation is to create positive economic opportunities for individuals.

References

Automation and Anxiety. The Economist. June 27, 2016.

Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation, *29*(3), 3–30.

Conroy, Tessa, and Steven Deller. 2015. "Employment Growth in Wisconsin: Is it Younger or Older Businesses, Smaller or Larger?" Patterns of Economic Growth and Development Study Series No. 3. Department of Agricultural and Applied Economics, University of Wisconsin – Madison/Extension.

Conroy, Tessa, Matt Kures. And Steven Deller. 2016. "Shifting Wisconsin Labor Resources: A Review of Educational Attainment." ?" Patterns of Economic Growth and Development Study Series No. 4. Department of Agricultural and Applied Economics, University of Wisconsin – Madison/Extension.

Egan-Robertson, David. 2013. "Wisconsin's Future Population Projections for the State, Its Counties and Municipalities, 2010 – 2040." University of Wisconsin-Madison Applied Population Laboratory. Prepared for the Wisconsin Department of Administration Demographic Services Center.

Ewing, Mandy. 2004. "Testing for Spatial Mismatch Milwaukee: A Comparison of Methodologies." Master's Thesis, Department of Agricultural and Applied Economics, University of Wisconsin - Madison.

Loritz, M., Nerad, B., Sletten, P., & Cunha, J. (2013). "Examining the skills gap in Wisconsin." Prepared for the Wisconsin Legislative Council. Retrieved from http://www.lafollette.wisc.edu/images/publications/workshops/2013-Leg_Council.pdf

Robinson, B. D., Walzer, N., & Keller, J. (2016). Workforce 2020: Is it time for disruptive innovation ?, (April).

"Wisconsin Workforce Innovation and Opportunity Act Combined State Plan." 2016. Draft. Prepared by the Wisconsin Department of Workforce Development. Madison, WI.

Appendix

Wisconsin Occupations and Wages/Salary by Educational Requirement

	Annual 25th Percentile	Annual 50th Percentile (Median)	Annual 75th Percentile	Annual 90th Percentile
		Less than high school		
Retail Salespersons	$ 17,690.00	$ 20,240.00	$ 27,030.00	$ 37,700.00
Combined Food Preparation and Serving Workers, Including Fast Food	$ 16,630.00	$ 17,950.00	$ 19,280.00	$ 23,500.00
Cashiers	$ 17,050.00	$ 18,600.00	$ 21,160.00	$ 25,160.00
Waiters and Waitresses	$ 16,750.00	$ 18,150.00	$ 19,720.00	$ 26,120.00
Laborers and Freight, Stock, and Material Movers, Hand	$ 20,750.00	$ 26,390.00	$ 34,020.00	$ 41,420.00
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	$ 18,270.00	$ 21,780.00	$ 27,490.00	$ 35,460.00
Personal Care Aides	$ 19,340.00	$ 21,420.00	$ 23,410.00	$ 25,660.00
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$ 18,390.00	$ 22,660.00	$ 29,670.00	$ 38,440.00
Bartenders	$ 16,820.00	$ 18,330.00	$ 21,100.00	$ 27,790.00
		High school diploma or equivalent		
Customer Service Representatives	$ 25,930.00	$ 32,470.00	$ 40,600.00	$ 49,860.00
Office Clerks, General	$ 23,610.00	$ 30,290.00	$ 37,330.00	$ 45,910.00
Childcare Workers	$ 17,650.00	$ 20,100.00	$ 23,960.00	$ 28,920.00
FirstLine Supervisors of Office and Administrative Support Workers	$ 36,900.00	$ 47,380.00	$ 61,360.00	$ 76,100.00
Maintenance and Repair Workers, General	$ 29,040.00	$ 37,670.00	$ 46,830.00	$ 56,580.00
Team Assemblers	$ 22,690.00	$ 28,700.00	$ 36,520.00	$ 46,110.00
Receptionists and Information Clerks	$ 21,740.00	$ 26,950.00	$ 31,580.00	$ 37,210.00
Carpenters	$ 33,780.00	$ 43,660.00	$ 63,750.00	$ 74,350.00
Tellers	$ 21,440.00	$ 24,220.00	$ 28,780.00	$ 33,380.00
Bookkeeping, Accounting, and Auditing Clerks	$ 28,430.00	$ 35,150.00	$ 42,530.00	$ 50,640.00
		Postsecondary nondegree award		
Heavy and TractorTrailer Truck Drivers	$ 32,710.00	$ 39,040.00	$ 48,870.00	$ 59,700.00
Nursing Assistants	$ 22,850.00	$ 26,480.00	$ 29,940.00	$ 34,840.00
Teacher Assistants	$ 21,110.00	$ 26,610.00	$ 30,970.00	$ 36,340.00
Hairdressers, Hairstylists, and Cosmetologists	$ 18,390.00	$ 22,790.00	$ 31,010.00	$ 40,870.00
FirstLine Supervisors of Production and Operating Workers	$ 42,680.00	$ 53,980.00	$ 68,160.00	$ 80,920.00
Firefighters	$ 19,280.00	$ 26,120.00	$ 44,500.00	$ 59,360.00
Computer User Support Specialists	$ 35,210.00	$ 44,390.00	$ 56,470.00	$ 70,720.00
Dental Assistants	$ 30,670.00	$ 35,730.00	$ 41,840.00	$ 46,770.00
Computer, Automated Teller, and Office Machine Repairers	$ 25,670.00	$ 34,620.00	$ 45,580.00	$ 55,260.00
Telecommunications Equipment Installers and Repairers, Except Line Installers	$ 36,230.00	$ 50,230.00	$ 63,850.00	$ 73,610.00
Electrical and Electronics Repairers, Commercial and Industrial Equipment	$ 44,830.00	$ 53,650.00	$ 59,920.00	$ 70,090.00
		Associate's degree		
Registered Nurses	$ 55,240.00	$ 64,090.00	$ 74,920.00	$ 87,830.00
Dental Hygienists	$ 54,820.00	$ 63,210.00	$ 71,340.00	$ 76,230.00
Preschool Teachers, Except Special Education	$ 20,280.00	$ 23,530.00	$ 30,320.00	$ 42,300.00
Paralegals and Legal Assistants	$ 34,660.00	$ 44,100.00	$ 55,720.00	$ 69,270.00
Computer Network Support Specialists	$ 43,270.00	$ 55,660.00	$ 70,360.00	$ 86,690.00
Web Developers	$ 42,080.00	$ 53,790.00	$ 67,800.00	$ 85,630.00
Veterinary Technologists and Technicians	$ 25,840.00	$ 31,430.00	$ 37,490.00	$ 44,470.00
Agricultural and Food Science Technicians	$ 29,190.00	$ 37,030.00	$ 45,370.00	$ 53,750.00
Electrical and Electronics Engineering Technicians	$ 40,510.00	$ 51,900.00	$ 62,860.00	$ 74,230.00

Wisconsin Occupations and Wages/Salary by Educational Requirement (cont.)

	Annual 25th Percentile	Annual 50th Percentile (Median)	Annual 75th Percentile	Annual 90th Percentile
		Bachelor's degree		
General and Operations Managers	$ 56,360.00	$ 85,480.00	$ 130,840.00	*
Accountants and Auditors	$ 48,990.00	$ 61,150.00	$ 77,230.00	$ 96,930.00
Secondary School Teachers, Except Special and Career/Technical Education	$ 43,120.00	$ 53,740.00	$ 65,260.00	$ 76,240.00
Computer Systems Analysts	$ 56,730.00	$ 70,860.00	$ 87,320.00	$ 104,010.00
Middle School Teachers, Except Special and Career/Technical Education	$ 43,670.00	$ 54,580.00	$ 65,770.00	$ 74,930.00
Substitute Teachers	$ 23,260.00	$ 32,280.00	$ 45,720.00	$ 61,450.00
Market Research Analysts and Marketing Specialists	$ 39,930.00	$ 50,830.00	$ 68,540.00	$ 89,140.00
Management Analysts	$ 55,540.00	$ 70,690.00	$ 89,600.00	$ 112,960.00
Industrial Engineers	$ 58,930.00	$ 71,970.00	$ 87,660.00	$ 104,050.00
Software Developers, Applications	$ 65,180.00	$ 80,130.00	$ 94,880.00	$ 114,040.00
		Master's degree		
Education Administrators, Elementary and Secondary School	$ 81,310.00	$ 94,470.00	$ 111,720.00	$ 125,160.00
Educational, Guidance, School, and Vocational Counselors	$ 39,620.00	$ 50,300.00	$ 64,440.00	$ 79,540.00
Healthcare Social Workers	$ 40,770.00	$ 49,570.00	$ 58,770.00	$ 68,130.00
Physician Assistants	$ 78,830.00	$ 92,000.00	$ 107,020.00	$ 121,370.00
Nurse Practitioners	$ 83,080.00	$ 92,740.00	$ 105,840.00	$ 119,020.00
Librarians	$ 40,230.00	$ 52,370.00	$ 62,760.00	$ 76,510.00
Occupational Therapists	$ 56,960.00	$ 67,330.00	$ 76,310.00	$ 90,000.00
Mental Health Counselors	$ 32,160.00	$ 44,790.00	$ 59,020.00	$ 71,030.00
Community and Social Service Specialists, All Other	$ 26,580.00	$ 33,440.00	$ 41,130.00	$ 50,990.00
		Doctoral or professional degree		
Lawyers	$ 55,970.00	$ 83,860.00	$ 128,990.00	$ 184,270.00
Pharmacists	$ 111,530.00	$ 126,970.00	$ 142,630.00	$ 152,630.00
Clinical, Counseling, and School Psychologists	$ 48,470.00	$ 66,450.00	$ 87,150.00	$ 113,950.00
Dentists, General	$ 113,420.00	$ 163,750.00	*	*
Biological Science Teachers, Postsecondary	$ 52,160.00	$ 64,970.00	$ 91,370.00	$ 128,310.00
Mathematical Science Teachers, Postsecondary	$ 48,030.00	$ 65,000.00	$ 97,820.00	$ 147,100.00
Computer Science Teachers, Postsecondary	$ 56,810.00	$ 80,350.00	$ 128,650.00	$ 168,140.00
Engineering Teachers, Postsecondary	$ 74,970.00	$ 95,490.00	$ 127,390.00	$ 164,610.00
Animal Scientists	$ 54,950.00	$ 69,210.00	$ 98,090.00	$ 120,440.00