



RURAL INNOVATION REPORT

Created by the Wisconsin Startup Coalition
and the University of Wisconsin Agricultural
& Applied Economics — powered by
Alliant Energy.



Agricultural & Applied Economics
College of Agricultural & Life Sciences



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Committed to Diversity, Equity, and Inclusion

Our Care for Others Value continues to be the cornerstone of our workplace diversity, equity and inclusion efforts (DE&I). We have six Employee Resource Groups who work to create a culture of inclusion and a sense of belonging for our employees. Additionally, we have advanced our commitment to supporting diversity in the communities we serve by expanding our pathways programs and investing in STEM and Early Careers programs.

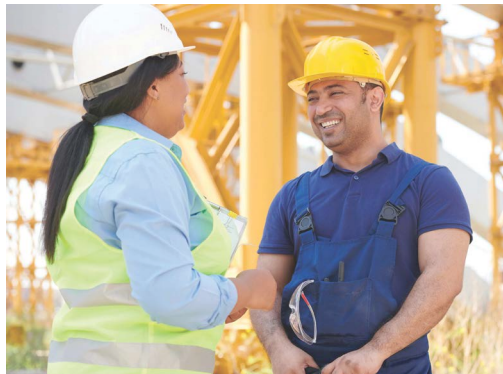
Alliant Energy was included in Bloomberg's Gender Equality Index – which highlights just 380 companies from around the world who are committed to supporting gender equality in the workplace. In addition, we were recently named to *Newsweek's* list of "America's Most Responsible Companies" – where we ranked a top 30 company overall – for our social responsibility efforts. To top it off, Alliant Energy was named to *Forbes'* list of "America's Best Midsize Employers" and, for the fifth straight year, earned a perfect score on the Corporate Equality Index issued by the Human Rights Campaign Foundation.

Supporting Communities and Customers

Working together to build stronger communities is a vital part of our purpose. In 2022, Alliant Energy was recognized as a "Top Utility" by *Business Facilities* magazine. This selection follows the news that in 2021, for the third year in a row, Alliant Energy was named a "Top Utility in Economic Development" by *Site Selection* magazine. This list recognizes the top 20 companies, nationwide, for contributing to community development, creating jobs, and collaborating with institutions of higher learning – demonstrating the value of our partnerships within the communities we serve.

Alliant Energy employees, retirees, and the company's charitable foundation collectively contributed over 75,000 volunteer hours and \$11.6 million in donations during 2021. These efforts supported community partners, including food banks, community action agencies, United Way, and other nonprofit organizations.

At Alliant Energy, our customers and communities are at the heart of everything we do. We promise to continue listening to your ideas and delivering energy to you in the reliable, responsible manner you've come to expect.





WISCONSIN STARTUP COALITION

Advancing Wisconsin's Innovation Ecosystem for Startup Founders

Why isn't Wisconsin performing better in national rankings for startup activity? This is the very question that brought a small group of entrepreneurs, venture investors, community builders, and policy advocates together in early 2020. What emerged was the vision for a new organization driven by early-stage startup founders with a focus on improving the regulatory environment in the state for founders and their companies.

This vision quickly turned into action, and the non-profit, non-partisan advocacy organization, Wisconsin Startup Coalition (WSC), was launched in the fall of 2020. As the news about the formation of WSC spread throughout the state, membership quickly grew. WSC remains proud that most members are startup founders with diverse experiences and backgrounds. As startup founders shared their experiences about starting or growing a startup, a common theme emerged... the status-quo was not cutting it anymore and WSC needed to push the boundaries of what **SHOULD** be possible in Wisconsin by 2026, which would bring the total to 90.

WSC is changing the conversation about startups at the State Capitol, engaging legislators and agency leadership with common sense ideas, told through the actual experiences of our members. **Over the next decade, WSC will continue to unite stakeholders and push Wisconsin from the back of the pack to become a leader in supporting startups.**



Advocate for Change

WSC's Advocacy Platform supports entrepreneurs and startup founders and improves the early-stage ecosystem.



Build Industry Partnerships

WSC actively collaborates and brings people together to influence change.



Support Innovation

Work with innovators from across Wisconsin to build a foundation for better startup growth.

Want to learn more? Visit us at wistartupcoalition.org

Rural Innovation and Entrepreneurship

Authors: Tessa Conroy, Steven Deller, Ted Callon

Department of Agricultural and Applied Economics, Economic Development Administration
University Center at UW-Madison, Division of Extension University of Wisconsin-Madison

Innovation and Entrepreneurship

Innovation moves the economy forward. Innovations are new products, processes, or services that create value for customers. Innovations often signal an improvement over a past model or way of doing things. Innovations can be significant, disrupting the status quo. Many innovations, however, are modest, offering small increases in quality of life or slight value enhancements to consumers.

Innovations come from a wide range of settings — from large multi-national corporations that invest heavily in research and development to an individual who develops a new idea in their home. As private industry leads research and development in the U.S. (Deller and Conroy 2017a, 2017b; Conroy and Deller 2017), small and large firms are key to developing new knowledge that leads to advances in technology and new goods and services on the market. New ideas, however, also occur outside of existing businesses as individuals identify needs, solve problems, and experiment. The image of Steve Wozniak tinkering with computers in his garage and Steve Jobs bringing what became the first Apple computer to market comes to mind.

Innovation can happen anywhere. While urban areas benefit from dense industry and a versatile labor market that can lead to an innovative environment, rural areas too have unique assets that can lead to innovation. Having clusters of farms with complementary agricultural industries, natural amenities, or a concentration of highly skilled workers can all lead to innovation in rural communities. Many rural areas enjoy a rich quality of life and proximity to urban amenities that attracts talented individuals. Rural areas are also rich with manufacturing and, as discussed below, many manufacturers invest significantly in research and development which can lead to innovation.

Innovations start with an idea, but to get to market, that idea needs to be refined, combined with capital investments and business savvy. This process of bringing the innovation to market is what we refer to as the entrepreneurial process. Sometimes entrepreneurs come up with ideas themselves that they then commercialize, but sometimes entrepreneurs work with an existing idea or in partnership with others to advance a new product or service. Wozniak designed personal computers but Jobs brought them to market. Entrepreneurs may be people pursuing their first venture, or a small business owner seeking to expand or improve their offerings. Even within a larger firm, entrepreneurial individuals with the skills and talent to recognize, develop, and steward new products to market are essential.

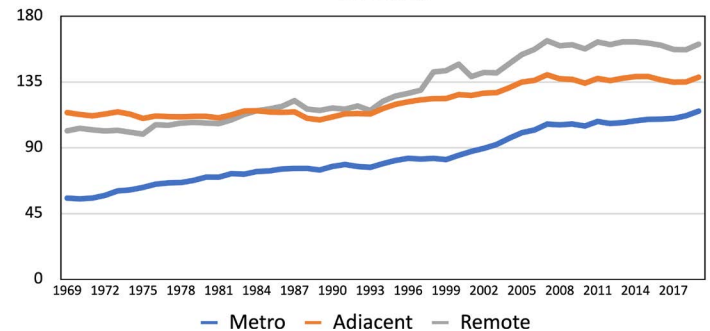
Given the many challenges of advancing their innovations to market, small firms and individual entrepreneurs sometimes partner with other entities. These could include larger, more established firms, local, regional, state, or even federal agencies, institutions of higher education, or local business development organizations. Larger more established firms generally have the capacity to bring innovations to market, unless they are overburdened with bureaucratic inertia that stifles entrepreneurial behavior. But even existing innovative businesses can require assistance to capitalize on the innovation. This assistance could come in the form of technical help such as that reflected in the “Economic Gardening” program operated by the University of Wisconsin. Here a team of technical experts provide targeted assistance to help a business move forward. Another form of assistance could be a venture capitalist who brings both financial and technical assistance to a business to help facilitate bringing the business’ innovation to market.

In any case, entrepreneurs are critical to the process of identifying good ideas, taking on risk, developing strategies to minimize risk and bringing them to market. Startup activity signals the final stage of an entrepreneur introducing an innovation and testing it out on the market. More start-up activity can be a signal of an economy rich with innovation, advancement, and value-added for consumers.

This connection between innovation and entrepreneurship is good news for rural areas. Rural areas are already quite entrepreneurial. Proprietorship, one type of business ownership, is more common in rural than in urban areas and businesses survive longer in rural communities—signaling entrepreneurship as a rural asset (Figure 1). Rural businesses also survive at higher rates than their metro counterparts (Deller and Conroy, 2016). Some rural communities are rich in natural amenities which attract talented populations who are inclined to start businesses (Conroy and Watson, 2021). Rural areas can also be a popular destination for the near and newly retired who may be inclined

to pursue a second career as an entrepreneur and subsequent boost entrepreneurial activity (Deller, Kures and Conroy, 2019). Further, a lesson learned from the COVID pandemic is that telecommuting has become a more viable work alternative. High amenity rural areas with strong quality of life factors could experience an influx of telecommuters, which could be a seedbed for new entrepreneurial activity. Taken together, rural communities have the potential to leverage entrepreneurship to boost innovation.

Figure 1: Proprietor Employment Per 1,000 Population
Wisconsin



What Is Rural?

Perceptions

The difference between rural and urban is, in part, a matter of perspective. Someone from Milwaukee may consider Lancaster (pop. ~3,700) to be rural, yet someone from Livingston (pop. ~660) might consider Lancaster urban.

U.S. Office of Management of Budget (OMB) defines a metropolitan area (county) as having at least one [urban area](#) of at least 50,000 persons, plus adjacent territory that has a high degree of economic and [social integration](#) with the core as measured by [commuting ties](#). Dane County is clearly metropolitan (urban), but because of strong commuting flows with Dane County, Iowa County is also considered metropolitan. Residents of Iowa County, however, tend to view themselves as rural.

The Census Bureau defines any place (municipality) as urban if it has a population of at least 2,500. Using this definition, Lancaster is indeed urban whereas Livingston is rural.

Thus, while what is urban or rural can be a matter of perspective, our analysis of the economic data requires some definition to move forward and we will use the OMB's definition of metro.

A Working Definition

To conduct our analysis, we need specific working definitions of urban and rural. This report breaks "rurality" down into three different levels, "metro," "adjacent," and "remote." Ultimately, "rural" refers to "adjacent" and "remote" areas. A "metro" county is one of two types. First, it can be a "central" county, which has at least one area that has 50,000 or more persons in it and a population density of at least 500 persons per square mile. Secondly, it can be an "outlying" county, which either has 25% of its labor force commute into a "central" county for work or has 25% of said "central" county's labor force commuting into it for work (ERS, 2019). An "adjacent" county is a non-metro county that physically adjoins one or more metro areas and has at least 2% of its labor force commuting to "central" metro counties. A "remote" county is any county that does not fall under the "metro" or "adjacent" classification (ERS, 2020).





Blue Line Battery engineers intelligent lithium-ion power systems that are a more energy-efficient, environmentally friendly, and safer alternative to lead acid batteries.



Kristen Holtan

Beloit | Population: 36,836

Since her freshman year of college at UW-Whitewater, Kristen Holtan has immersed herself in the world of entrepreneurship. She has had a hand in over a dozen startups, including two of her own. She co-founded Blue Line Battery and is the driving force behind the company's marketing efforts. Kristen is recognized on the Wisconsin Inno Under 25 list for 2021.

What are the pros and cons of being headquartered in Beloit?

Pros

- Centrally located to several big cities, but small-town feel.
- Strong industrial history which provides a great network for entrepreneurship.
- Tight knit community allows startups to receive more local attention and resources than startups in larger cities.

Cons

- Far fewer overall capital resources when compared to larger communities.
- Finding the talent we need for the highly technical work who also want to live/work in a smaller city.

Keys to Success outside of metro communities?

Mentorship and collaboration. We have partnerships in strong entrepreneurial networks. I was lucky to have some great mentors at UW-Whitewater that really helped me get on the right path.

Take-aways for non-metro innovation?

We must make a proactive effort to revive smaller towns.

Coworking spaces are critical to cultivating ideas and collaboration.

Communities must identify what makes them unique and invest in that, whether it's a specific industry sector, a group of investors, or a visionary business leader. Leverage your assets.

Bullish on Wisconsin?

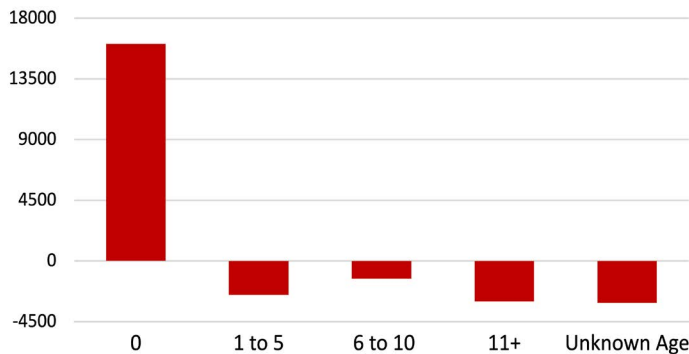
Encouraging people to experience the culture of the Midwest because it is more accepting and forward than people may think and there are misconceptions about small towns that aren't big cities.

How do you want to pay it forward?

It's important to share with the next generation early on what it means to innovate and be an entrepreneur- it's not always about making money, it's about impact too.

Beyond being a primary mechanism to bring innovations to market, entrepreneurship offers several benefits to the broader community. Entrepreneurship plays a critical role in job creation as startups create a disproportionately large share of new jobs (Conroy and Deller 2015, Decker et al. 2014). Without new jobs from startups, there would be no additional jobs added to the economy in any given year, as existing establishments generally lose jobs on net (Conroy and Deller 2015 (Figure 2). Entrepreneurship has also been linked to income growth and poverty alleviation in rural America (Goetz, Fleming and Rupasingha, 2012; Rupasingha and Goetz 2013). When a government focuses on fostering entrepreneurship rather than betting on a single industry to win by providing subsidies, this can also lead to more industrial diversity because business owners across all industries can benefit from entrepreneurial support. With a more diverse local economy, communities are less vulnerable to the downturns of any given industry (Deller and Watson, 2016a, 2016b; Watson and Deller 2017).

Figure 2: Average Annual Net Job Creation by Firm Age
Non-Metro Wisconsin, 1978-2018



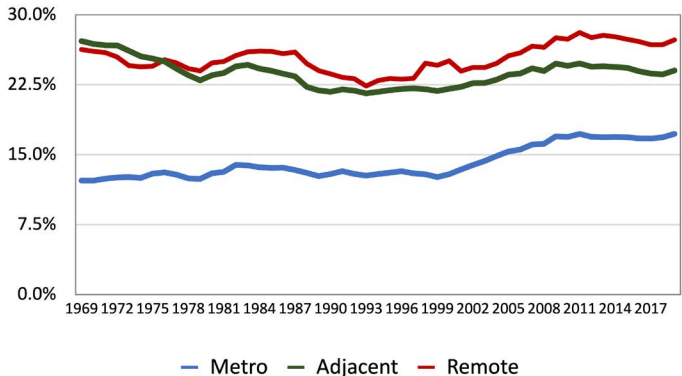
This report is composed of four additional sections. In the first section that follows, we describe and assess how entrepreneurship influences the Wisconsin rural economy focusing specifically on employment and business trends. We then turn attention to how to measure the innovative capacity in the Wisconsin economy. Particular attention is paid to the difficulties of developing meaningful measures of innovation. In the following section we outline a framework to think about ways to boost entrepreneurial innovation in Wisconsin. We use the Community Capitals approach to thinking about creating a positive entrepreneurial and innovative environment in Wisconsin. We close this report with a summary of the key points coupled with strategies or moving forward.

ENTREPRENEURSHIP IN RURAL WISCONSIN

Given the entrepreneurial potential of rural communities to bring forward new innovations, we take a closer look at several measures of innovation and entrepreneurship for rural Wisconsin. Entrepreneurship is multifaceted—encompassing innovation, risk-taking, risk management, business management, and clear lines of ownership, many of which are difficult to observe and measure. Innovation is just one key input into the entrepreneurial process of offering a new product process or service. As discussed in more detail below, it is difficult to quantify innovation beyond patents and spending on research and development (R&D) as it commonly happens privately, often in the form of problem-solving, whether that is within the walls of a company or at home in a garage. Entrepreneurship, too, can be difficult to define and measure precisely as risk-taking and experimentation can be hard to observe, let alone objectively compared across people. For example, in the case of Apple computer, we tend to classify Wozniak as the “tinkering innovator” and Jobs as the “business entrepreneur,” whereas the lines in reality are more blurred.

Given the challenges of developing a single measure that captures innovative entrepreneurship, we use several proxies and indicators to evaluate rural Wisconsin’s entrepreneurial potential. First, we consider the proprietor employment and proprietor income shares. Keep in mind, rural Wisconsin has a comparative advantage in the proprietorship rate—the number of proprietors per 1,000 residents. We can also consider proprietorship employment as a share of total employment which gives sense of entrepreneurial breadth (Low et al. 2005) or the extent of entrepreneurial activity as a share of the overall economy (Figure 3a). The most rural parts of Wisconsin, those that are remote or adjacent to metro areas, not only have a high rate of proprietorship but the proprietors’ share of total employment is also relatively large at 27% and 24% percent respectively. The share of

Figure 3a: Wisconsin Proprietors' Share of Total Employment



proprietorship income gives a sense of entrepreneurial depth, or the performance of entrepreneurial ventures as measured by the share of overall income (Figure 3b). Proprietors' income is also relatively high in remote and adjacent areas at 8% and 7%, as of 2019, respectively.

Next, we consider startup activity of employer businesses. A new business can be a signal of an innovation that has reached the market as an entrepreneur tests a new idea with consumers. In this way, the startup rate of new establishments is an indicator of an innovative environment. In Figure 4, we track the number of new businesses per 1,000 employees by rurality for Wisconsin over the past several years. Remote Wisconsin consistently had the most startup activity over the 40-year period since 1978. Nonmetro-adjacent Wisconsin has the next highest startup rates, and metro Wisconsin consistently had the lowest startup rate across the period.

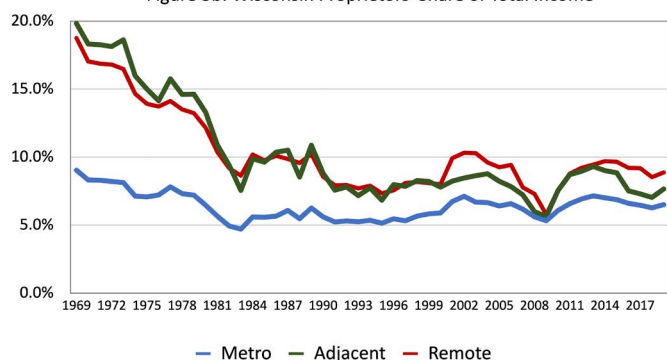
Even though startup activity has generally been higher in rural Wisconsin compared to more urban areas, startup rates have been declining in general, and relatively steeply, in remote Wisconsin. At the

highest, there were 16 new businesses per 1,000 employees in remote Wisconsin in 1978. Most recently, in 2018, the rate is roughly eight businesses per 1,000 employees, half of what it was at the peak. Similarly, in nonmetro-adjacent Wisconsin, the startup rate fell from near 11 establishments per 1,000 employees to near four in 2018.

Importantly, however, these are new establishments with paid employees. Consequently, any change in activity among the very smallest types of businesses, such as self-employed sole proprietors, is excluded. The decline in new establishments with employees may be at least partly offset by the rise of small businesses consisting of just an individual or a few partners such as those associated with the "gig economy." These may be contractors, freelancers, and other "gig" or self-employed workers. In the U.S., these small businesses without employees are sometimes called "nonemployer businesses" and they make up more than 75% of all businesses.

Looking at these small businesses without paid employees can lend insight into how entrepreneurial activity for very small or early-stage ventures is changing. In Figure 5a we show the growth of businesses with and without employees since the end

Figure 3b: Wisconsin Proprietors' Share of Total Income



Different ways of measuring small business activity:

Self-employed—Refers to a type of worker. Self-employed people can have more than one job. They can also have more than one business and their business(es) can have payroll employees. So, the number of self-employed will differ from the number of businesses whether with or without paid employees.

Businesses without paid employees—Refers to a type of business with no payroll also called a "nonemployer."

Proprietorship—Refers to a tax status. Self-employed individuals can incorporate or file as sole proprietors. Nonemployers can also incorporate or not, but the large majority are unincorporated. So, nonemployers tend to track closely with sole proprietors.

Source: SBA, 2013

Figure 4: Establishment Entry Per 1000 Employees by Rurality Wisconsin

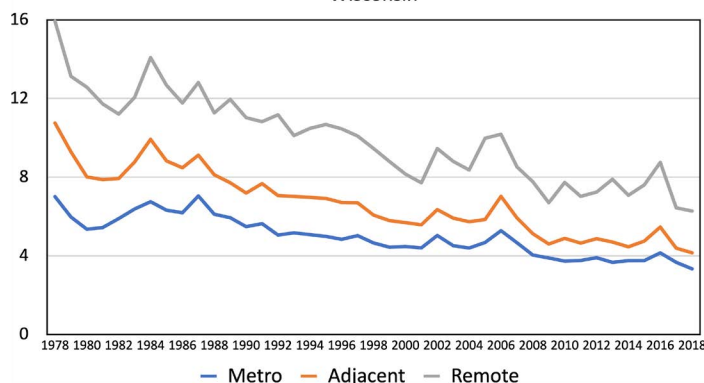
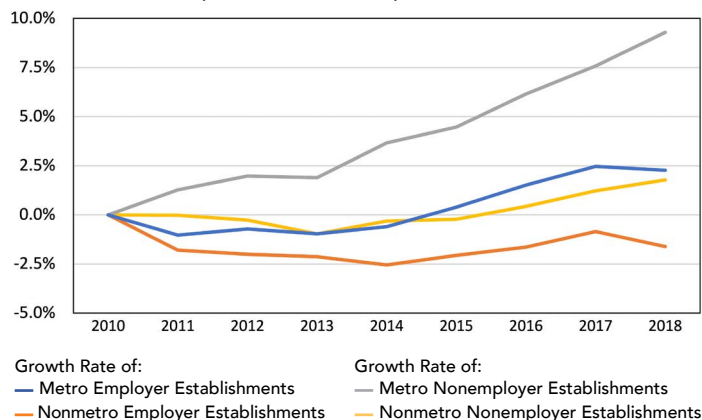
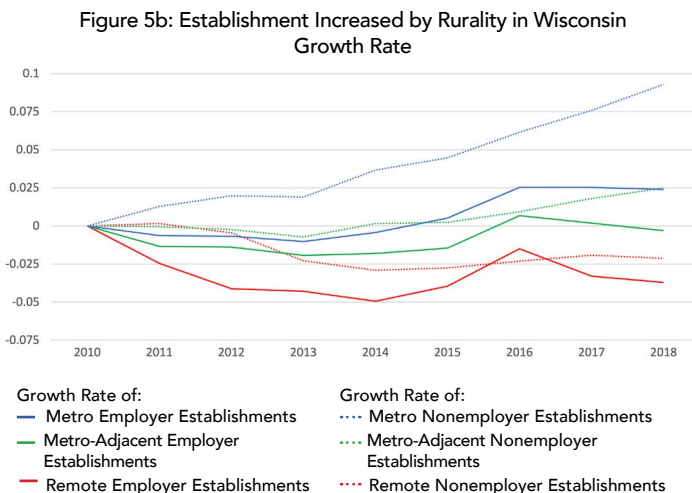


Figure 5a: Growth Rate of Employer and Nonemployer Establishments in Metropolitan and Nonmetropolitan Wisconsin Counties



of the Great Recession. The lingering effects of the Great Recession are evident except for nonemployer establishments in metro Wisconsin counties. It is not until about 2016 that the growth in employer establishments began to turn positive for metro employee establishments and nonmetro nonemployer establishments. Most noticeable is the continued decline in the number of nonmetro employer establishments. For both metro and nonmetro Wisconsin, the growth in nonemployer establishments has been vital to the post Great Recession Recovery.

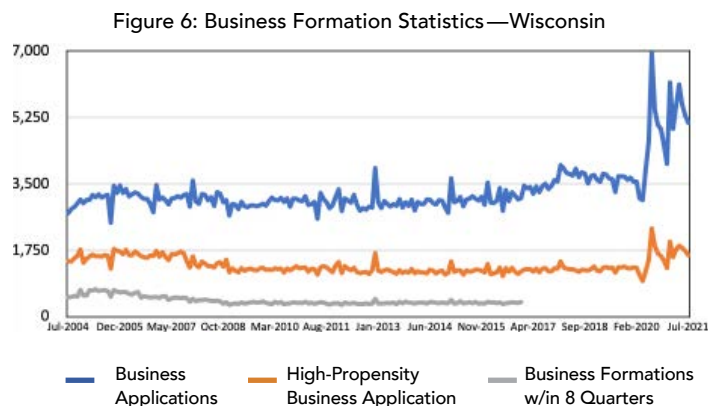
If we decompose nonmetro Wisconsin counties into those that are adjacent to a metro county and those that are nonadjacent (i.e., remote), a clearer insight into what is happening in rural Wisconsin becomes apparent (Figure 5b). While there is still a lag in nonmetro adjacent counties, there is noticeable growth in nonemployer businesses starting in about 2013. Other than in 2016, the growth in employer establishments in adjacent counties has generally been flat, if not slightly negative. Remote rural Wisconsin counties (nonmetro-nonadjacent) experienced a decline in the growth of businesses, both employer and nonemployer types, over the whole period. This reflects how more remote rural areas tended to lag behind in the post Great Recession recovery. Still, when looking across the whole time period and urban-rural spectrum, new business formation is being driven by nonemployer establishments.



The rise of establishments without employees may signal an increase in entrepreneurial activity that is different from entrepreneurial activity of the past that more often resulted in a firm with several employees. The pandemic may also signal a shift in entrepreneurial activity: many traditional types of wage-and-salary employment went away or became more difficult. At the same time, some households received stimulus money

and, unlike in previous recessions, financial markets remained strong. In this context, many people have seemingly pursued entrepreneurship as evidenced by new business applications (Figure 6) for an employer identification number (EIN). An EIN might be compared to a social security number for businesses and even businesses without employees may apply for one as they can be required for business bank accounts, as an example, and other business activities. Though not available by rurality, the data indicates widespread increases in new business activity. Business applications for the last six months of 2020 were up 43% compared to the same period in 2019. Among those, a smaller share, deemed “high-propensity” business applications based on a high likelihood of going on to hire employees, were up 33%. Time will tell if these initial applications during the pandemic will result in fully formed businesses (tracked with the gray line).

It is unclear currently if the recent spike in filings for new businesses (Figure 6) is a short-term effect of COVID or a more permanent shift to people wanting to be self-employed. As the economy recovers from the pandemic induced recession, the labor shortage issues experienced prior to the pandemic appears to be exacerbated in the recovery. Some have argued that the extended unemployment benefits discouraged workers from returning. But states that eliminated the extended benefits did not see a noticeable change in labor force participation rates. There is growing evidence that the lack of quality and affordable childcare is intensifying the labor shortage and some workers are still uncertain about remaining health risks associated with COVID. Relevant to this study, however, the evidence is indicating that a growing number of people are moving toward self-employment. If this is a short-term reaction to COVID, again remains unclear, there appears to be a growing opportunity to invest limited state and local resources into entrepreneurship support programs and efforts.





Arbré Technologies, Inc. is a Wisconsin-based company that uses state-of-the-art software and innovative hardware to help horticultural businesses and other green asset companies efficiently manage inventory — improving workflows, eliminating waste, reducing time, decreasing costs, and improving margins.



Matthieu (Matt) Vollmer

Stevens Point | Population: 26,229

Matt is one of the co-founders of Arbré Tech. He works on strategic leadership and the direction of the company. Matt also coordinates strategic planning within the team, works on marketing initiatives, and is directly involved in the sales process. In his free time, he enjoys spending time with his wife, Ashley, and their three children, Melody, Elsie, and Adelyn. He also likes most outdoor activities including, but not limited to, running, hunting, fishing, and golf.

Why Stevens Point?

We wanted a company that reaches beyond geographical boundaries. Rural areas resonate well with our company culture, target customers, and employees. It's an ideal place to raise a family, which is important to me and my team.

How could it be better for startups?

The creative side of innovation thrives in Stevens Point, like the arts and nonprofits; but, there seems to be less interest in economic oriented for-profit ventures, and limited access to capital.

What's your take on Wisconsin's views on entrepreneurship?

There is a humble mindset in the community that can make it difficult to feel confident in your product, or innovative business, without the stigma of feeling like you're being arrogant. That is a tough mindset to grapple with when you're pitching opportunities to potential investors.

In general, risk tolerance for investments in technology-based businesses seems low; particularly in rural areas that have a long history of investing in brick-and-mortar small businesses, manufacturing, and other asset-heavy businesses.

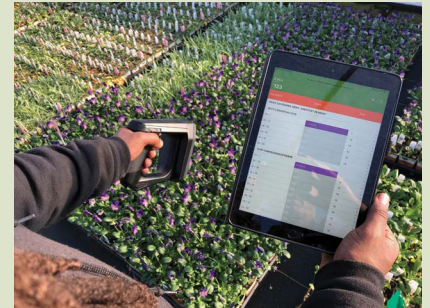
Advice for rural startup founders?

Resources are less robust compared to metro areas, so you must be more proactive about making connections in the community, or look beyond your immediate geography, to access those resources.

How can we help non-metro entrepreneurs?

There's largely a misunderstanding of what it takes to scale a technology-based business; in today's society we are much more connected globally than ever before so there's a need for more resources quickly.

Local governments could be more supportive of a digitally innovative community, including gig economy folks, and understand we're an economic driver much like the brick-and-mortar businesses, mature technology, financial businesses, and farmers' agricultural businesses that have worked in rural communities for years. We must remember that mature companies were once startups and received a lot of support along the way.



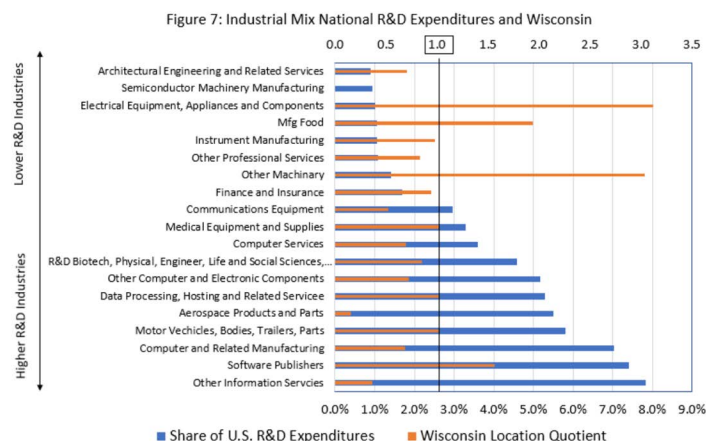
ASSESSING INNOVATION

Good ideas with market potential are at the beginning of the entrepreneurial process. Some ideas come about serendipitously, but others are developed more intentionally through identifying solutions to ongoing problems or by creating new knowledge through research and development (R&D). In the U.S., private industry is responsible for most of the research and development spending, and within private industries certain sectors dominate research activity. Innovation through R&D in these industries may lead to new offerings from a company or result in spin-off entities or individuals that take the lead on commercializing the new knowledge.

Using R&D expenditure data collected by the National Science Foundation (NSF) it is possible to see how Wisconsin's industrial structure fits into the R&D industrial mix. In these data from 2018, the most recent year of the NSF data, the Pharmaceutical and Medicines industries dominate R&D expenditures, accounting for nearly 19% of the national total. After removing this industry, which is an outlier compared to all the other industries examined by the NSF, Information Services, Software Publishers, Computer and Related Manufacturing spend the most on R&D nationally (Figure 7).

In the same figure, the employment-based location quotient shows whether Wisconsin has a relatively large concentration, compared to the U.S. average, of a given sector. Wisconsin has a relatively small concentration of employment in Pharmaceutical and Medicines (not shown), Information Services, and Computer and Related Manufacturing sectors as indicated by a location quotient less than one. Conversely, Wisconsin has a relatively large concentration of Software Publishers. The relatively high R&D spending combined with the large presence in Wisconsin points to an industry with innovative potential in the state. While Wisconsin has a relatively strong presence in some high R&D investment industries (e.g., Software Publishers), the predominance of employment is in industries that are less inclined to invest in R&D, and by this measure, tends to be less innovative.

From a rural innovation perspective, it is important to better understand how the employment distribution across industries for Wisconsin (Figure 7) is distributed across the urban-rural spectrum. Is it the case that the high R&D industries that are present in Wisconsin



sin concentrated inside or outside of metropolitan areas? To gain insights into these differences we looked at the distribution of employment by industry across metro, nonmetro adjacent and nonmetro non-adjacent (remote) and report the analysis in Figures 8a, 8b and 8c, respectively.

The overall pattern for Wisconsin in terms of the concentration of employment in higher R&D investment industries is particularly evident in rural Wisconsin. For rural counties that are adjacent to metropolitan counties, only a small handful of higher R&D spending industries appear to be a strength (based on the location quotient). For remote rural Wisconsin counties, the industries with relative strength appear to be in the less R&D intensive industries. Thus, the pattern identified for the whole of Wisconsin, where much of the state employment is in industries that are not R&D intensive, seems to be intensified for rural Wisconsin.

In essence, Wisconsin does not have significant levels of employment in industries that are considered high R&D investors. This is particularly true for rural Wisconsin. This is not to say that there are not companies in Wisconsin that invest heavily in research and development. SHINE Technologies in Janesville is one example of a company investing significant R&D resources in fusion technologies, or NorthStar Medical Radioisotopes in Beloit that invests in advances in complex manufacturing processes. These examples, however, are stereotypical of how innovation is viewed as the outcome of significant dollar investments in advanced technologies. But as we have discussed, innovation runs a wide spectrum from groundbreaking developments such as Exact Science's Cologuard® to existing small businesses adopting new processes.

The limit to using R&D expenditure data as reported by

A location quotient (LQ) is an indicator of industrial relative strength where an LQ greater than one indicates a higher level of economic activity than expected. A value less than one means that there is less activity than expected. Here economic activity is defined as employment in the industry, and Wisconsin is compared to the national economy.

the National Science Foundation is that the data comes from companies taking deductions and credits for R&D expenditures on their federal tax filings. Only the largest and most R&D intensive firms are likely to take advantage of these federal tax laws. For many smaller entrepreneurs who are investing in innovation are not declaring such expenditures on their federal taxes and as such are lost to the NSF data. This limitation to the NSF data speaks to the challenges of measuring investments in innovation.

Another commonly used measure of innovation is patent data. Patent data can be a rich source of information on technical characteristics of inventions, development and ownership of inventions and, the history of applications. Unfortunately, these data have proven to have serious limitations. Firstly, many innovations are not suitable for patents because they involve new ways to think about or approach a problem. Ideas or new insights are not patentable. Secondly, the propensity to file patent applications differs significantly across industries. In some industries, or fields of inquiry, advances come with incremental or marginal changes and there is a tendency to apply for a patent for each modest advancement. As a result of this “patent flooding” strategy, some technical fields have a larger number of patents than others. Analysis of patenting by research universities has shown that some universities are more aggressive with patenting marginal or incremental advances than other universities. Because of differences in patenting strategies some universities can appear to more “innovative” than others. The same applies to how different companies approach patenting strategies. Thirdly, not all patents are the same. As discussed, some patents cover incremental changes to existing products while others can be revolutionary. Finally, many new firms that are bring an innovation to market for the first time or even small and medium sized businesses, the costs and logistics of applying for an enforcing a patent is unacceptably burdensome.

For rural innovators, most tend to be small or medium sized and the costs/logistics of the patenting process is formidable. Indeed, an analysis of patents originating in Wisconsin over 40 years reveals that very few patents are from people or businesses located in nonmetropolitan counties (Figure 9). A further analysis of specific counties finds that Dane County has an outside share of patents. This is likely due to the nature in which UW-Madison encourages faculty and staff to pursue patenting opportunities. Thus, for our purposes, the patent data is less than ideal for assessing levels of innovation across the Wisconsin urban-rural spectrum.

Figure 8a: Industrial Mix National R&D Expenditures and Metro Wisconsin

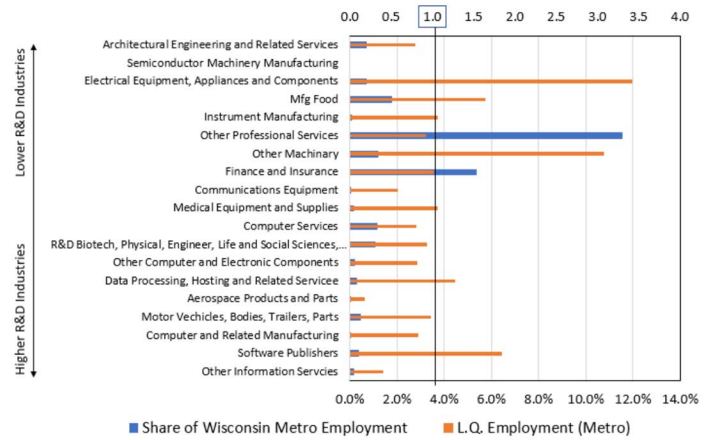


Figure 8b: Industrial Mix National R&D Expenditures and Adjacent Wisconsin

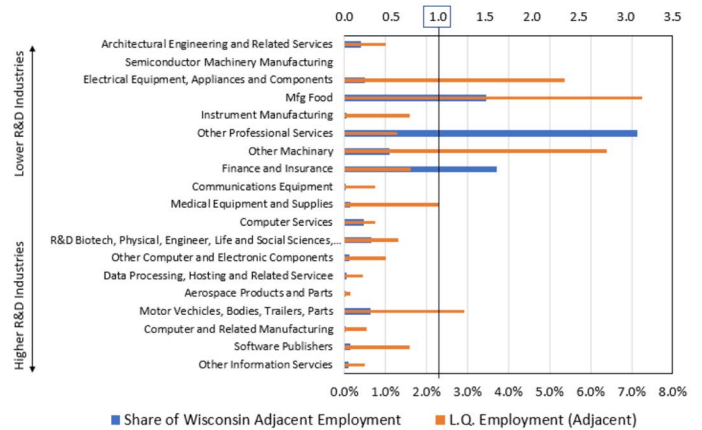


Figure 8c: Industrial Mix National R&D Expenditures and Remote Wisconsin

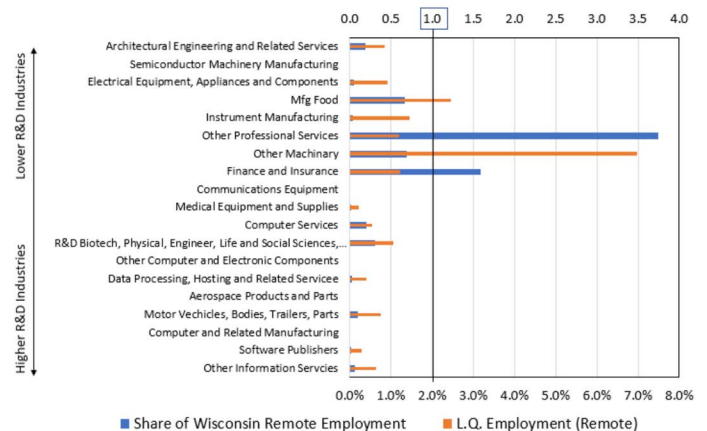
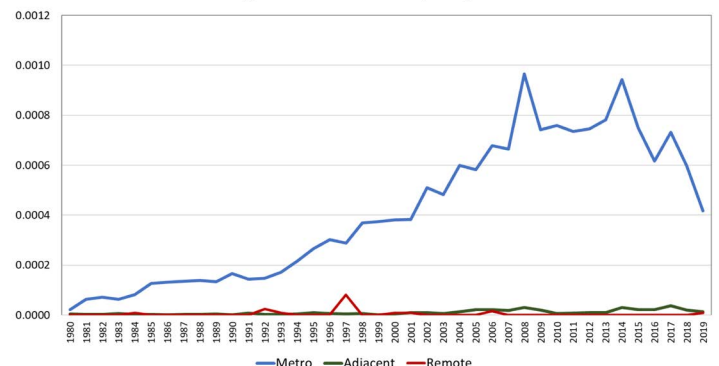


Figure 9: Wisconsin Patents per Capita



Debtle.

Debtle is a cloud-based software that automates, improves, and simplifies the negotiation and settlement of overdue customer accounts.



Stephanie Hoskins

Kohler | Population: 2,146

Stephanie Hoskins spent a decade in corporate finance and strategy before co-founding a B2B SaaS startup, Debtle. Her experience includes a large non-profit healthcare system, a publicly traded retail pharmacy chain, and several semesters spent teaching corporate and personal finance courses to undergraduates. She has degrees in finance from Tulane University and LSU, and is working on a dissertation for a financial economics PhD program. Originally from the Midwest, Stephanie and her co-founder/husband, Houston, moved their family and their startup to Sheboygan County shortly after the pandemic began. Stephanie is passionate about financial inclusion, community involvement, and civic engagement.

What's great about the Sheboygan area?

Quality of life and affordability are great in Sheboygan County. We are close to family and the public school system is much better than anywhere else we were looking. In addition, our location is close enough to Milwaukee and Chicago that we can easily tap into those networks. It is also slow paced so we were able to shut out all the distractions and really focus on our business.

What's challenging about running a startup in the Sheboygan area?

There are many entrepreneurs in Sheboygan, but not a ton of tech startups. The entrepreneurs are in bigger companies who are doing innovative things, but it's a lot tougher to connect with local smaller companies like us. Legacy industries that have typically had economic power, created all the jobs and had all the money, are not always aligned with the new ways to make money and jobs in their cities.

You hear this all the time, but the internet can be a challenge, especially in comparison to our previous home—New Orleans. We can run our business from this community, but better broadband would be a huge improvement.

How has the growth of your company been impacted by the shifting phases of the pandemic?

We're feeling a bit more isolated now that there are more events in person in the cities.

What do you need as a non-metro founder?

A rural network where people outside of the big city hubs could connect.

A program to educate and coach potential angel investors on the venture asset class. There's minimal understanding of venture investing among many higher net worth members of rural communities. We could unlock a lot of capital this way.

Strong state programs, like the Qualified New Business Venture Program that encourage investors, are extremely important.

Safe and standard convertible notes that are founder and investor friendly, and a breakdown of the little steps in the process to make everything less intimidating for the investor.

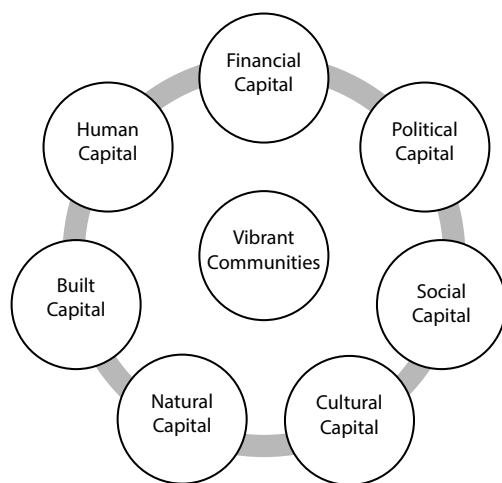
INCREASING RURAL ENTREPRENEURSHIP

Entrepreneurship is already an asset of many rural Wisconsin communities but there is room to grow and improve. Communities that want to further develop this asset, should think broadly about the entrepreneurial ecosystem—all the factors that attract, support, and sustain entrepreneurs, business owners, and community members. The challenge is developing a framework to think about all the interconnected pieces to a complex puzzle. Once such a framework is established economic development practitioners, policy makers and concerned citizens can begin to think through viable strategies to create a more entrepreneurial ecosystem at the local and regional level. One such framework is Community Capitals.

A COMMUNITY CAPITALS FRAMEWORK

The Community Capitals framework offers a useful structure for considering a diversity of strategies to support entrepreneurs. Much like a business uses a wide range of inputs in their production processes, communities also are built on several different inputs or capitals. In this framework there are seven different types of inputs or capitals: financial, political, social, human, built, natural, and cultural (Figure 10) (Emery and Flora, 2006).

Figure 10. Community Capitals Framework



Cultural Capital includes the pattern of who community members know and feel comfortable with, how heritages are valued, and the level of collaboration across races, ethnicities, and generations. Importantly, entrepreneurs' benefit from collaborative and inclusive environments that engage with new ideas and celebrate differences.

Human Capital reflects the skills and abilities of a community's members, as well as the ability to access

outside resources and bodies of knowledge in order to increase understanding and identify promising practices. Entrepreneurs will benefit from access to training and education both for themselves and in the form of hiring their needed work forces.

Social Capital reflects the connections among people and organizations or the social cohesion to take collective action in the community. Relationships and the exchange of information across community members is incredibly important for entrepreneurs. Creating strong networks for all community members can ensure that high social capital in the community benefits all entrepreneurs equitably.

Political Capital is the ability to influence the formal "rules of the game" such as state and local statutes and regulations and their enforcement. Allowing entrepreneurs access to local leaders and the ability to speak to policies that affect the business community can be important for fostering a strong partnership between public and private entities and creating supportive environment for new businesses.

Built Capital is the infrastructure that supports the community, such as that for transportation, telecommunication, and water, as well as parks and commercial buildings. For entrepreneurs, retail space, transportation infrastructure, and broadband may be especially important local assets.

Natural Capital has historically been viewed through the lens of extractive industries such as farming, forestry, mining, and water-based transportation but has shifted toward preserving natural amenities in support of the tourism and recreation industries. Entrepreneurs are often mobile—able to start their business wherever they desire to live. All else equal, entrepreneurs appear to be drawn to places rich with natural amenities which may motivate communities to protect or enhance such an asset.

Financial Capital, which perhaps has the most visible impact on entrepreneurship and the ability to invest in innovations, speaks to the ability to gather and organize financial resources to underpin investments. Financial capital reflects the presence of banks, community development financial institutions, or credit unions but also local rotating loan funds, investor communities, and informal networks with financial resources.

While a business may be operating to maximize profits, produce a given level of output at the lowest possible cost, or maintain a reasonable and stable return on investment for the owners of the business, communities applying this framework are seeking

to use their inputs, or capital, to build a vibrant community. Vibrant communities are those that are resilient to shocks, entrepreneurial in how they approach community issues, innovative in how they address those issues, and, most importantly, forward-looking in their planning. Vibrant communities embrace change and are constantly looking for new ideas, new innovations, and new ways of addressing community concerns. Vibrant communities create economic opportunities for residents. In the end, the ultimate goal is to create a community with a high quality of life that is attractive to entrepreneurs and supports entrepreneurial activity.

COMMUNITY CAPITALS IN WISCONSIN

While the Community Capitals framework provides us with a comprehensive, systems-thinking approach to valuing multiple and overlapping “inputs” or “capitals” as the drivers of a vibrant entrepreneurial community, empirically measuring these can be challenging. For example, political capital speaks to the ability to influence public policy. How does one quantitatively measure something like this? Part of the current research effort being undertaken by the scholars of community economic development is exploring and testing alternative empirical measures of Community Capitals. For this analysis of rural innovation, we have drawn on several studies and developed quantitative measures for many of these capitals at the county-level. We use the most data available for all the counties in the lower 48 U.S. states. Next, we use a statistical method known as principal component analysis to combine the different measures of each Community Capital into a numerical index. We then map each of these Community Capital Indices with a focus on Wisconsin within the context of the U.S. For comparisons, the national maps of the various Community Capital Indices are provided in an Appendix to this report.

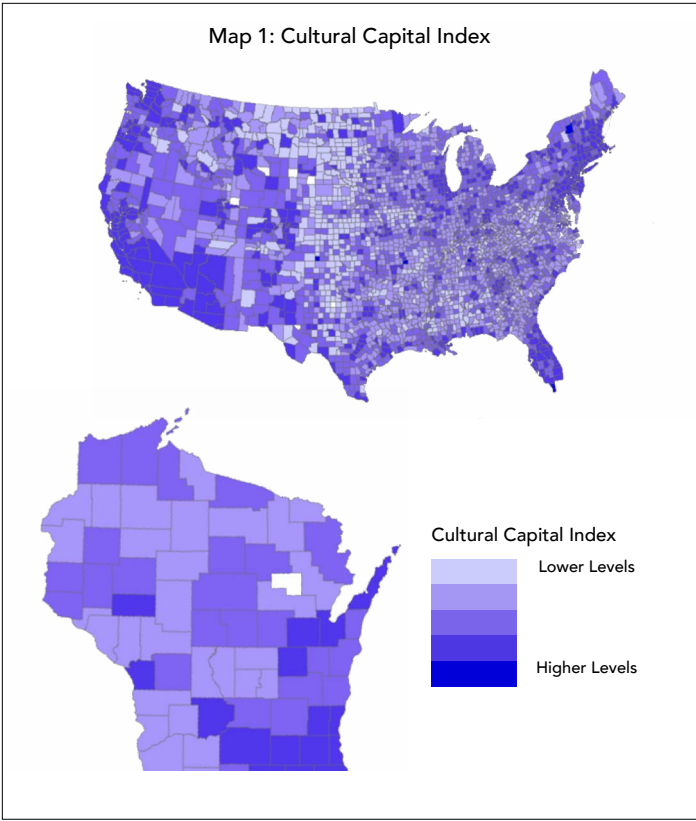
Cultural Capital Index	Index Weight
Theaters and Sports Entertainment Concentration	0.4341
Historical Sites and Museum Concentration	0.2445
Natural Sites and Zoo Concentration	0.1839
Religious Congregation Concentration	-0.5962
Percent of the Population Rural	-0.6021
Variance Explained	0.3828

Cultural Capital speaks to how members of the community view themselves within the community. This could be through the lens of historical traditions or how the community approaches issues. For practical purposes scholars and practitioners of community economic development quantify cultural capital in terms of institutions that support cultural activities such as theaters and museums. Our Cultural Capital Index is composed of five different attributes ranging from the number of theater and sports entertainment enterprises per capita to the percent of the population that is rural.¹ The “Index Weight” captures the degree to which the individual variable contributes to the total index. Here the number of theater and sports entertainment enterprises per capita contributes more than historical sites and museums or the concentration of natural sites, and zoos with the latter contributing very little to the final index. Note that the concentration of religious congregations and percent of the population that is rural enters the index with negative values. This implies that the concentration of theaters, sports venues, historical sites, museums, natural sites and zoos tends to move in the opposite direction from religious concentration and rural populations. In other words, more rural places with more religious congregations tend to have fewer of these other enterprises. These results should not be interpreted as communities with a higher concentration of religious congregations have lower levels of cultural capital; rather the cultural elements are different.

In the case of cultural capital, the index highlights regional variation (Map 1). What drives cultural capital in some communities is different than others. In some communities, cultural capital is likely driven by rural religious congregations. In others, it is driven by theaters, sporting venues, historical museums and zoos. The index shows there is little overlap between the two. In this case, where community culture varies, the index does not tell us that one place has an advantage over another. Rather, that the cultural capital asset looks different from community to community and that should be taken into consideration when pursuing an economic development strategy focused on entrepreneurship.

From a perspective of fostering a more innovative environment, rural communities can focus on enhancing cultural activities ranging from farmers markets, live music events, community art programs, and

¹ When we combine all five of these different community (county) characteristics associated with cultural capital, 38.3% of the total variation across the five measures is explained by the index.



celebrations of community history. If we think in terms of the “creative class” or people who are in creative occupations as advanced by Richard Florida, research has suggested that people that fall into this category of occupations tend to be attracted to places with high levels of cultural capital. There is a circular and cumulative causation type effect. To the extent that entrepreneurs are footloose and creative, investing cultural development may attract entrepreneurial individuals to a region or community. By focusing on attracting the “creative class” and fostering an innovative entrepreneurial climate or ecosystem, enhancing the quality of life through investments in cultural capital primes the pump for long-term growth and development. Thus, a natural community economic development strategy is to invest in institutions that advance cultural activities. For rural communities, this could range from arts fairs to farmers markets to live music events.

Human Capital speaks to the resources that are available to the community residents to support their ability to identify issues, collect relevant information, and make informed decisions. Human capital also addresses leadership’s ability to “lead across differences,” focus on assets, be inclusive and participatory, and be proactive in shaping the future of the

community or group. Human capital is also critical to the entrepreneurial process. Talented individuals come up with and identify ideas. It takes skill to see a product or service through development and run a business. By region, places with a large college-educated population tend to be the most entrepreneurial (Conroy and Weiler, 2015). The skills required for entrepreneurship, however, are diverse and the ability to gain those skills will depend on the quality of the local educational system including technical colleges, business development trainings, and access to valuable work experience. Further, business owners and employees will need access to high-quality employees and contractors. Thus, considering the ability to develop human capital locally is critical for communities looking to grow their entrepreneurial potential.

When attempting to empirically measure human capital the “default” measure is educational attainment, with a higher share of the adult population having at least some higher educational experience being a positive indicator of human capital. However, research on community vitality suggests that this traditional view is too narrow and should be broadened to include elements such as health. Research suggests that there is a direct relationship between the health of the population and economic productivity: healthier people tend to be more productive than unhealthy people (Deller 2022). Thus, our Human Capital Index is composed of one measure of educational attainment and four measures of health in the community.²

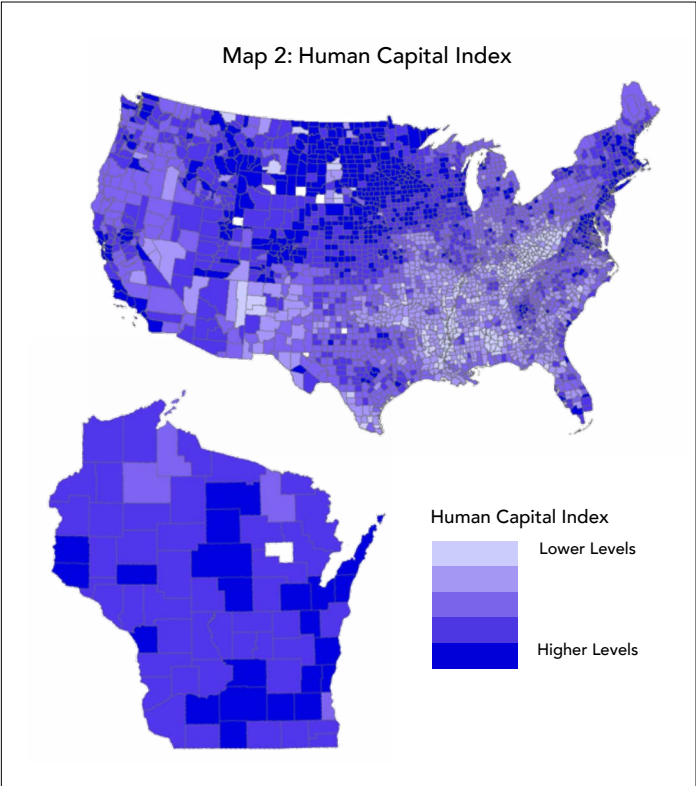
The Educational Attainment Index looks at the distribution of education levels of those 25 years and older over six different thresholds, ranging from less than a 9th grade education, to post graduate degrees. If the Index takes on a positive value that

Human Capital Index	Index Weight
Educational Attainment Index	-0.3422
Life Expectancy	0.4233
Fair or Poor Health	-0.4688
Physically Unhealthy Days	-0.5004
Mentally Unhealthy Days	-0.4833
Variance Explained	0.7291

²The principal component derived Human Capital Index explains 72.9% of the variation of all five measures and higher values of the Index is associated with higher educational attainment and better health outcomes.

means that the distribution of education levels is skewed toward lower levels of education and a negative value means that the distribution is skewed toward higher levels. Our health measures range from average life expectancy for the county to the percent of adults reporting fair or poor health, physically unhealthy days, and mentally unhealthy days.

Relative to the U.S. (Map 2) Wisconsin counties tend to have higher levels of human capital based on our Human Capital Index. This reflects the rich historical tradition of Wisconsin investing in education at both the K-12 and higher education levels. In addition, access to health care tends to be strong across Wisconsin and is reflected in programs such as Badger-Care and the strong network of community/regional health care providers.



In order to foster a more entrepreneurial environment for Wisconsin communities, we need a strong pipeline of healthy skilled individuals. Engaging in entrepreneurship itself is risky and taxing. Access to reliable quality healthcare makes taking the risk of entrepreneurship more feasible for some. The education and experiences necessary to succeed can also may help entrepreneurs reduce risk and encourage them to pursue their venture. One strategy to

this end is to consider is continued or expanded investments in education and health care services. The investment in educational opportunities must be balanced between technical skills as well as critical thinking and problem-solving skills. Investments in health care should emphasize preventative care and overall well-being including mental health services. For many rural Wisconsin communities, the latter is of particular concern. The recent proposal to expand mental health services to Wisconsin farmers is an example of the latter.

Social Capital speaks to the flow of trusted information through networks of personal relationships. Innovation and effective entrepreneurial ecosystems hinge on high-quality, trusted information. More and more research points to the importance of relationships to entrepreneurs. Entrepreneurs can access time-sensitive and private information as well as access resources such as financing and workers through their networks. Information flows across several channels with person-to-person communications and the wider the network of personal connections the stronger the flow of information. For example, local business associations such as chambers of commerce can be a vital mechanism for networking business owners and managers. Here information is shared and further connections expanding the network can be established.

Social Capital Index	Index Weight
Same Residence Five or More Year	0.2595
Ethnic Diversity	0.4622
Poverty Rate	-0.3424
Non-Profits (Non-Religious) Concentration	0.4793
Membership Organization Concentration	0.4392
Violent Crime Rate	-0.4233
Variance Explained	0.3867

Research on social capital, innovation, and community economic development is extensive and several empirical measures of social capital have been explored. We draw on that literature in selecting six community characteristics to build our Social Capital Index ranging from residential turnover rates and ethnic diversity to concentrations of non-profits, membership organizations, and violent crime.³ Only the poverty and violent crime rates enter the Index

³ Our principal component derived index explains 38.7% of the total variation in the six different characteristics with higher values of the Index associated with higher levels of social capital.



N29 Capital Partners financially supports early-stage startup companies that have created products or services that are disruptive in their industry.



Nicole Justa

Manitowish Waters | Population 572

Nicole Justa is co-manager of N29 Capital Partners, a northern Wisconsin angel group that focuses on investing in early-stage companies. Nicole is also manager of gANGELS, an angel investor group that focuses on supporting startups that graduate from the many programs offered by gener8tor, a Wisconsin nationally ranked accelerator.

What are some specific needs in non-metro areas for entrepreneurs today?

One of the major economic needs in northern WI is for everyone to have access to fast and reliable WiFi, which can be non-existent in certain areas.

Vilas County Eye on Entrepreneurs Network began in 2011 to incubate and mentor startups or expanding businesses in the Northwoods. N29 Capital Partners relationship with this has allowed investment throughout the Northwoods and a space for remote workers.

What factors led to your company being in a non-metro area?

Carl Ruedebusch, the other partner in N29, is a commercial developer based in Madison and has a second home in Vilas County. Because of his involvement in the startup ecosystem in Madison, he wanted to help startups in northern WI. As a resident of Minocqua, I met Carl while serving on the board of the Vilas County Economic Development Corporation, and to further help startups financially, N29 Capital Partners was created. N29 Capital Partners is described as an angel group that not only has a northern WI focus but also participates in the startup ecosystem throughout the rest of the state.

What resources are most in need?

One of the major economic needs in northern WI is for everyone to have access to fast and reliable Wi-Fi, which can be non-existent in certain areas. Lack of Wi-Fi is a major hindrance for rural communities to thrive in this internet-based economy, so N29 Capital Partners has a focus on helping bridge the Wi-Fi gaps-not only in the rural areas of WI-but across the country.

It is with this goal in mind that N29 has invested in WiscLift, an innovative Wisconsin company focusing on drone-based dynamic networks, systems integration, and closing the gaps in connectivity. Using the Telelift drone platform and next-generation mobile & Wi-Fi radios, WiscLift can provide connectivity to the military, first responders, and the general public.

with negative weights, suggesting the higher levels of these two variables are associated with lower levels of social capital with violent crime having a slightly larger negative effect. The three variables that have the largest positive effect are ethnic diversity and the concentration of non-profits and membership organizations.

Relative to the U.S. (Map 3), the levels of our Social Capital Index across Wisconsin tend to range toward the middle of the national distribution. One factor that might explain the relatively average position of most Wisconsin counties is the relative lack of ethnic diversity across many Wisconsin counties and pockets of higher poverty. Door County appears to have the highest level of the Index while Milwaukee County has the lowest. The result for Milwaukee is likely due to higher poverty and violent crime rates.

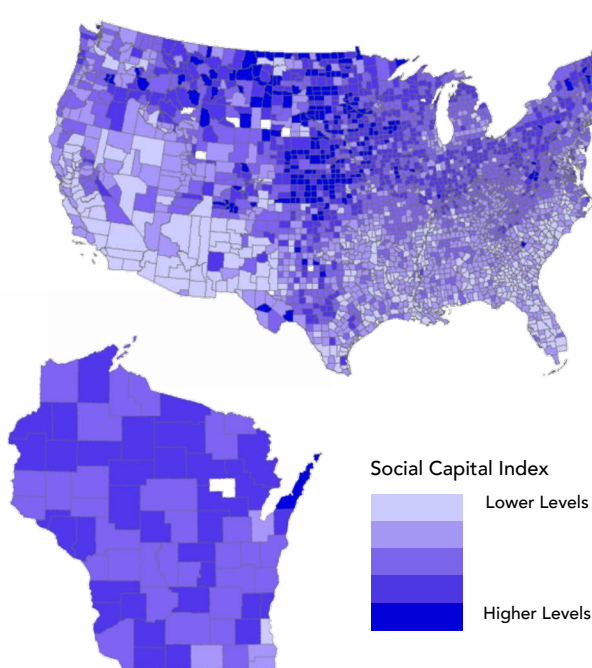
Given the relative importance of networking opportunities (e.g., membership organizations) and ability of people with shared values (e.g., non-profits) to come together and share information, a logical

entrepreneurs, however, suffer a less networked position and struggle to developing trusting relationship—newcomers, women, and people of color are especially vulnerable to this disadvantage. Communities wanting enhance entrepreneurship especially among marginalized audiences, may consider how to build more equitable networks and foster bridging social capital. The importance of ethnic diversity implies that networking opportunities should draw from as wide a potential pool of people as possible, including minority business owners/managers and non-male entrepreneurs. Minority-owned businesses are a fast-growing segment of the entrepreneurial community and foreign-born individuals are more than twice as likely to become entrepreneurs (McDermott and Conroy, 2021). Yet, a network disadvantage can inhibit entrepreneurial activity from marginalized community members. Designing strategies to welcome and include those outside the mainstream business community with newcomers' clubs and business associations is a way communities can work toward equitably expanding social capital to support entrepreneurship.

Political Capital is, again, the ability to influence the formal “rules of the game,” such as state and local statutes, regulations, and their enforcement. It reflects access to power and power brokers, such as to the local office of a member of Congress, local, county, state, or tribal governments, or leverage with a regional business. For entrepreneurs, connecting with local leadership can be an important vehicle for letting the needs of the business community be known. The ability to cultivate a strong relationship between public and private sectors can support entrepreneurship. Communication between groups may help raise awareness to cumbersome regulation and develop helpful resources. In a local community, this may look like updating zoning regulations, developing guides for food entrepreneurs as they work with their public health department or meet and greets between elected officials and business owners at their place of business.

Unfortunately, while the theoretical, or conceptual, research speaking to the importance of political capital to community vitality and positive entrepreneurial ecosystems is becoming more established, the empirical research is less developed. The most significant barrier to research is the lack of consistent data at the community (county) level. Unique data sets (e.g., survey data) have allowed for research in narrow geographic areas it is difficult to translate those data to other areas. For example, an excellent study (survey) of political capital in say Milwaukee

Map 3: Social Capital Index



policy implication is to promote these networking opportunities. Indeed, the popularity of many public-private partnership organizations across Wisconsin is largely driven by the desire to create greater opportunities for interactions or networking. Within the narrower focus of innovation, entrepreneurship, and business development, promoting opportunities for potential entrepreneurs and existing businesses to network and share information is vital. Some

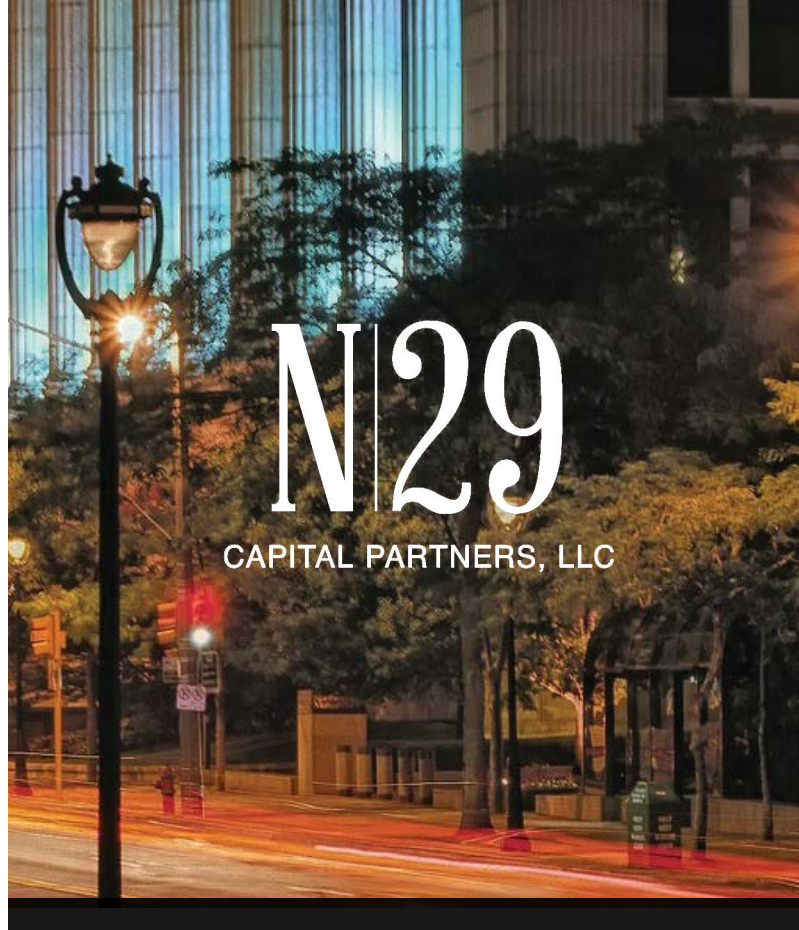
Political Capital Index	Index Weight
Vote Difference (Republican vs Democrat)	-0.6831
Political Organizations Per Capita	0.6965
Percent of Employment in the Public Sector	0.2197
Variance Explained	0.3519

does not help us develop empirical measures for Iowa or Buffalo County.

Thus, for our measure of political capital we rely on three widely available measures for all U.S. counties. These include voter preference, concentration of political organizations, and percent of local employment in the public sector. Voter preference is measured by the vote difference (percentage of all votes) in the 2020 presidential election between the Democratic and Republican candidates. A higher vote difference means that voters tend to be all of one political group whereas a lower vote difference means voters are more evenly split. For example, a county with 51% of voters voting Republican (49% Democrat) has a smaller differential and therefore more political diversity than another county that voted 75% Republican (25% Democrat). The concentration of political organizations speaks to how active residents are in political activities. The final measure is the percent of employment in the public sector. The logic here is that people that are public employees tend to be more conscientious of political activities within their community because of their direct involvement in the public sector. Indeed, because of their work they may bring unique insights into larger community wide discussions.⁴

A more unified voting pattern (larger shares voting either Republican or Democrat in the 2020 presidential election, thus leading to a larger differential) places downward pressure on our Index whereas a larger concentration of political organizations places upward pressure on our Index. The percent of employment in the public sector has a positive but relatively modest influence on the Index. Relative to the U.S. (Map 4) most Wisconsin counties have a relatively low level of political capital, based on our Index, with a handful of counties (e.g., Clark, Door and Grant) having higher levels. The low levels of political capital according to our Index is likely due to the lower levels of voter diversity across many counties. Dane County, for example, may have a relatively large number of political organizations for its population

⁴ Our Political Capital Index explains 35.2% of the total variation across the three measures.

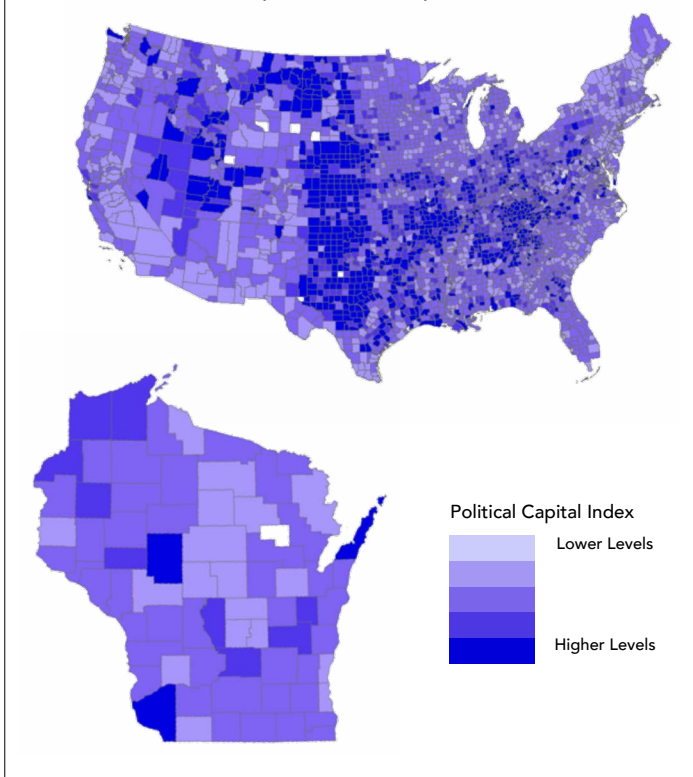


Responding to challenges in the area of hard infrastructure and the future of remote work:

Ruedebusch created the Vilas County Eye On Entrepreneurs (VCEO) Network, which began as a single, and then a series of buildings, dedicated to incubating and mentoring startups or expanding businesses in Wisconsin's Northwoods. VCEO now includes two facilities in Manitowish Waters, one in Phelps, and soon to be two facilities in Eagle River.

The facilities include office space, retail space, manufacturing and/or assembly space. Over the years, VCEO has hosted many companies from different sectors of the economy, including publishing, healthcare, and fabricating operations. VCEO's relationship with N29 Capital Partners has allowed investment, primarily in rural broadband expansion, throughout the Northwoods. Of special importance over the last 18 months has been VCEO's ability to accommodate remote workers seeking respite from larger cities during the COVID pandemic. This has resulted in hosting 51 remote workers in 2020, some of whom have found a permanent home with the VCEO.

Map 4: Political Capital Index



may want to consider how their built capital could be expanded in support of businesses as one strategy for expanding their entrepreneurial capacity.

Natural Capital takes two forms: extractive and non-extractive. Consider a forest which can be harvested (extractive) or used for recreation (non-extractive). For many rural communities, natural resources have been the backbone of extractive industries (e.g., farming, forestry, mining, fishing). But, as the economy has become wealthier, we have moved to more of a service-based economy where non-extractive consumption of natural resources has become more important. Increasingly, people and businesses are electing to locate in “high amenity” areas where resources such as forests are appreciated for their amenity value over their extractive (timber) value. This is evident across Wisconsin in how the North Woods are valued not for its timber but for its recreational opportunities or how the Driftless region is valued for its scenic beauty over its potential mining output. The recent debate around frac sand mining is evidence of continued conflict around alternative uses of our natural resources.

Entrepreneurs work for themselves and therefore may not be anchored to a place of work in the same that wage-and-salary employees often are. To the extent that entrepreneurs are mobile, we expect them to move to desirable places. Natural amenities are one component of desirability. Some businesses may be willing to forgo higher incomes and profits

Natural Capital Index	Index Weight
Average Temperature	0.6104
Air Quality PM2.5	0.6096
Percent of Land Covered in Forests	0.3666
Percent of Land Classified as Mountains	-0.3484
Variance Explained	0.4099

to locate in a place with access and enjoy higher levels of natural amenities. For some communities, they may choose to enhance or protect their natural assets as a way of attracting these entrepreneurial individuals and retaining them once they arrive.

For our Natural Capital Index measure we use four broad measures: average annual temperature, air quality, and the percent of land covered in forests and in mountains. The logic for these measures is as follows. First, migration patterns of people have told us that people prefer to live in warmer cli-

size, but it tends to heavily vote Democrat, meaning it has a more unified set of voters, and so, as a result, the voter differential is large, and our Index finds that it has a middling level of political capital.

From a policy perspective, these results may lend some insight into local political processes. While high levels of political unity may lead to general agreement and efficient decision-making, it may also stifle differing viewpoints. Entrepreneurs who are trying to do something new, need to be able to engage local leadership on important issues across the political spectrum. Those who are disenfranchised politically may also find it difficult to access the support necessary to thrive as business owners. Communities that encourage resident participation in government processes, respect differences of opinions, and approach conflict in a positive manner will have higher levels of political capital. This environment also creates a more vibrant and diverse entrepreneurial ecosystem that can lead to innovation.

Built Capital is the infrastructure that supports the community, such as that for transportation, telecommunication, and water, as well as parks and commercial buildings. Some would include the stock of housing in built capital. Research shows that businesses value rail, roads, telecommunications, as examples, and that access to broadband is critical for rural start-up activity (Conroy and Low, 2021). Communities



GIST

Your sidekick on the journey to well-being.



Gist is designed to be your sidekick on the path to everyday well-being. Our sparkling companion drinks are made with thoughtfully-sourced, botanical ingredients and 4g of plant-based prebiotic fiber to keep your gut happy and your body humming. Gist works symbiotically with your body to help you do you, whether you're in need of a pick-me-up, wind down, or something in-between.



Lizzy Haucke

Viroqua | Population: 4,377

Lizzy Haucke founded Gist in 2020 and remains at the heart of the company. For decades, Lizzy has embraced a "clean" lifestyle and approaches Gist as she does her own life: with intention and a "come as you are" philosophy. As an entrepreneur, mom, dancer and Pilates practitioner, Lizzy wanted a go-to beverage that aligned with her values and lifestyle. She created Gist to have delightful and distinctive flavor, while positively benefiting everyday life and health.

What are the pros and cons of working in a non-metro area?

Pros

One of the assets of being a rural founder is that my life is extremely efficient. My kids' schools and activities are literally minutes from my office, so I'm able to be the parent I want to be while also working the usual non-stop hours of a startup founder.

Cons

The biggest challenge is that I am far less connected to my peers than I was when I founded my first company in New York.

What are some specific needs in non-metro areas for entrepreneurs today?

I am most in need of local angel investors. It's surprisingly difficult to identify people who care about building a business right where we contrast with a metro region, where there are existing networks of angels and funds.

I think rural founders have a double whammy: we miss out on most of the efforts that the urban startup ecosystems put into developing early-stage funding opportunities, but we also have to invest time and energy into developing our own version of that ecosystem while also trying to raise funding and grow businesses. Rural communities need confidence, talent, and funding to support innovation.

The rural workforce lacks exposure to a startup environment - the risks and rewards, the attention to detail, and the tolerance for the unknown- that a startup requires.

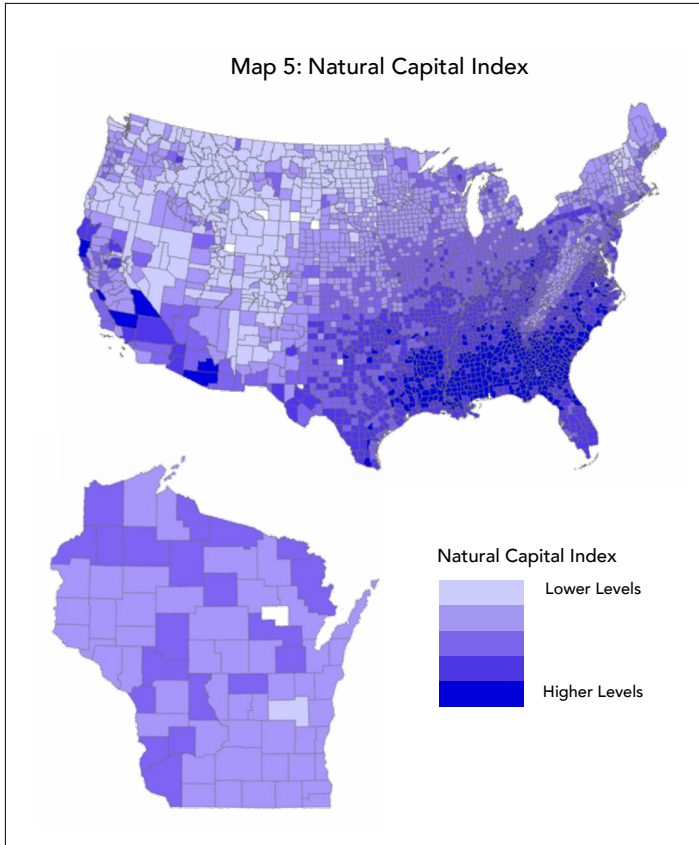
It's very difficult to find local capital that has an appetite for startup risk. Increasing familiarity among potential local investors around the risk and reward of developing a startup ecosystem in their locale is a key piece of the rural innovation puzzle; rural places need connectivity that is on par with metro areas.

I think that there's not an efficient way of matching potential investors who may have an interest in supporting a local startup with a deal down the street from them.

There's a fine line between small business and high-growth startups at an early stage, and improving potential investors' understanding of the residual effects their investment could have on their community is a key piece of rural startup ecosystems.

mates and avoid air pollution. Next, forests remain a vital resource, but increasingly seen through the lens of recreation and scenic beauty and a higher share of land in forests means a lower share of land or agriculture. Lastly, mountains provide great recreational opportunities and scenic beauty, and the Mountain West has seen significant in-migration in recent years for these reasons. While some may question referring to the Driftless region as “mountainous” we include this measure to capture some unique features of Wisconsin.⁵

The Natural Resource Index is largely driven by average temperature and air quality and to a lesser extent forest coverage. Indeed, percent classified as mountains enters the Index with a negative weight. What the data is telling us is that the first three measures tend to move together whereas mountainous characteristics moves in the opposite direction. In other words, mountainous counties tend to have lower average temperatures and lower levels of air pollution. Compared to the rest of the U.S. (Map 5) Wisconsin tends to rank low on our Natural Capital Index which is largely driven by lower average annual temperatures. Note, however, that Wisconsin counties with higher concentration of forested land tends to rank higher than other Wisconsin counties.



There is little Wisconsin can do about its climate, but how communities think about their natural resources is important. What is the proper balance between historical extractive-based industries and non-extractive industries that are gaining in importance? The answer to this question varies across Wisconsin, but through the lens of entrepreneurship and innovation, the movement toward “place-making” by many communities is relevant and important. What are the natural resources available to the community to make it more attractive to people, including potential innovative entrepreneurs? Can these natural resources be used in a more effective way to foster overall community well-being? Can resources, such as forests, be actively managed to support both extractive and non-extractive uses at the same time? Consider the conflict over frac sand mining in western Wisconsin where the choice was often presented as “either-or” rather than “both-and.” Several communities found compromises that allowed for frac sand mining, but in a manner that was respectful of recreational uses and scenic beauty.

Financial Capital, which perhaps has the most visible impact on entrepreneurship and the ability to invest in innovations, speaks to the ability to gather and organize financial resources to underpin investments. This means access to money, whether through credit or equity investments. In general, we often think of financial capital in terms of local financial institutions such as commercial banks or credit unions.

Financial Capital Index	Index Weight
Ordinary Dividends per Capita	0.4908
Taxable Interest per Capita	0.5039
Number of Business Loans <\$100K per 1K Population	0.5136
Dollar Volume of Business Loans <\$100K per Capita	0.4913
Variance Explained	0.7577

For entrepreneurs, financial capital is perhaps the most crucial community capital. Undercapitalization is one of the main reasons businesses fail. Thus, access to small business loans or other financing in the community is essential to supporting entrepreneurs, especially in rural areas where other forms of capital such as equity, or angel-investing, is more scarce (Conroy, Weiler, and Low 2017). For rural communities, considering banks, credit unions, rotating loan

⁵ The Natural Resource Index explains just over 40% of the total variation in all four measures.

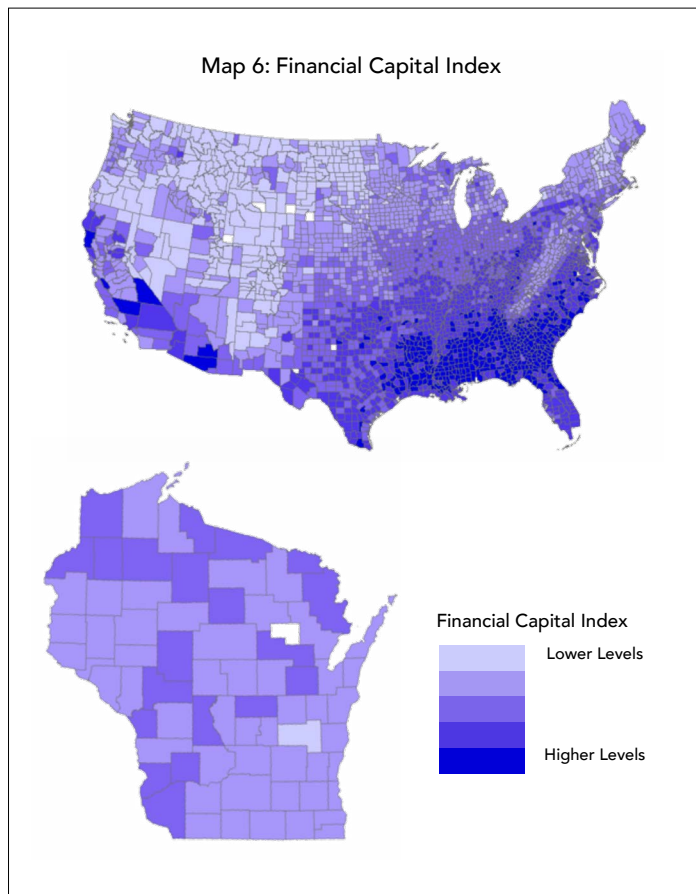
funds, investor groups, attracting equity, and developing community supported enterprise may all be ways to foster entrepreneurship.

Our final measure of Community Capitals is financial capital which speaks to the ability to gather and organize financial resources to underpin investments. For entrepreneurs and existing businesses that want to invest in innovation and bring those innovations to market, financial capital is perhaps front and center. For the Financial Capital Index, we combine four different measures into a single index. We use the level of ordinary dividend income per capita and taxable interest income per capita as measures of the financial resources at the disposal of individuals in the community. We also use the number of business loans valued at under \$100,000 (per 1,000 persons) and the dollar value of those loans per capita as measures of banks' (and other financial institutions') willingness to work with smaller businesses.⁶ A higher concentration of these smaller business loans are a direct measure of banks commitment to smaller businesses within the community. For most entrepreneurs across Wisconsin, and indeed the U.S., access to smaller lines of credits and loans is often a barrier to realizing their innovations.

A higher value of our Financial Capital Index is associated with greater access for small businesses to financial resources. Based on our Index, the typical county in Wisconsin tends to have lower levels of financial capital compared to the rest of the U.S. (Map 6). The handful of northern Wisconsin counties (e.g., Door County) with a higher Index is likely due to higher levels of wealthier retirees. Perhaps of more concern is the large number of more rural Wisconsin counties that fall into the lowest quintile classification. This is a cause for concern and presents

barriers to entrepreneurial activity, which in turn can limit innovation.

In absence of adequate small business lending from banks, communities may need to consider other models for enhancing access to financial capital. For example, communities can consider the offerings of credit unions and community development financial institutions. Alternatively, communities may want to develop a rotating loan fund or consider developing a local investor group or models of Community Supported Enterprise.



⁶ Our Financial Capital Index explains 75.8% of the total variation in our four individual measures with each having a roughly equal weight in the final Index.



At Ruby Coffee we are guided by the notion that responsible business can do good and create value for everyone involved—from the producers we work with, to our dear and valuable supporters drinking our coffees at home or preparing them in their shops. We are driven to present our menu in a way that celebrates the producer while also making the coffees inviting and accessible for everyday drinking.

Jared Linzmeier
Nelsonville | Population: 191



Jared Linzmeier and his family moved back to Wisconsin from the Pacific Northwest in 2013 with a vision for their specialty coffee company, Ruby Coffee Roasters. Jared worked in many roles in the specialty coffee industry prior to launching Ruby, including traveling coffee buyer, roaster, wholesale sales, and brand identity. They started Ruby in his garage and bootstrapped their way to become a national brand, recognized by publications such as *The Wall Street Journal*, *GQ*, *Bon Appetit*, and *Thrillist*, to name a few. Now the company is based in Nelsonville, Wisconsin, population 191, where they roast and distribute orders daily. In 2018 Ruby added a flagship cafe in nearby Stevens Point, Wisconsin. Throughout

Ruby's growth, Jared has helped center the brand around Wisconsin landscapes and lifestyles while also emphasizing their many direct relationships with coffee producers. One of his goals is to make delicious, craft coffee more accessible to consumers all over.

What factors led to your company being in a non-metro area?

When my wife and I were preparing to launch Ruby, we made the decision to start the business in the garage of my childhood home, located in unincorporated Portage County. We didn't want to take on outside investors or incur a huge amount of debt. We also thought the low overhead would help ensure focus and adherence to our core ideals and vision for our products.

Within a year, we were already looking for a new space to expand our business. Our search focused primarily on nearby small towns because there were some vacant commercial properties that would accommodate our growth while keeping costs low.

Our wholesale and direct to consumer sales had found success nationwide, so we thought it would be more fun and rewarding to maintain our presence in a small town. I am able to remain more focused on the many facets of our vision without the distractions of a higher traffic metro area.

What are the assets of running a company in a non-metro area?

The assets are many. In this current technology climate, we have essentially a level playing field with our competitors no matter where anyone is located. That means we have the same web platforms, similar shipping infrastructure, arguably better quality of life on a dollar-for-dollar basis. In addition, we have good access to qualified fabricators and a variety of specialized contractors that have contributed to keeping our niche equipment up and running smoothly. Also, we can craft a unique social media presence based on our physical surroundings.

The challenges we face running a company in a non-metro area pose specific barriers. Some examples are limited workforce, particularly for specialized roles, and infrastructure—we had a hard time finding a building with 3 phase electricity so we had to get a single-phase converter. Additionally, to service our coffee equipment, we hire a firm that is two hours away in the Madison area.

Finally, we are responsible for the maintenance and access of our old building, including snow removal. When a heavy winter storm hits, we are on our own to figure out access for UPS trucks, freight trucks, etc.

We had a significant power outage a few years ago in nearby Stevens Point that left some local residences and businesses

(Continued on page 30)

Venture Investing in Rural Areas

Venture Capital is a form of private equity where investors provide financing in exchange for a fraction of ownership in small companies with exceptional long-term growth potential, or that have rapidly grown and appear poised to continue to expand. Venture Capital investment gives entrepreneurs the flexibility to scale their companies to have an impact outside the communities they are founded in while, creating more jobs and wealth locally. Traditional SBA, traditional loans, and other financing programs are helpful for small main street businesses but are insufficient when it comes to financing the sort of high-growth companies that provide local job growth and other economic benefits that will ensure Wisconsin is prosperous for decades to come.

In recent years venture funds and angel investment networks located in non-metro areas of Wisconsin are on the rise including Idea Fund of La Crosse, N29 Capital Partners (Manitowish Waters), Gray Collar Ventures (Beloit), Chippewa Valley Angel Investors Network (Eau Claire), Sachse Family Fund (Sheboygan), Stateline Angels (Beloit), Titledown Tech (Green Bay), Tundra Angels (Green Bay) and Winnebago Seed Fund (Neenah). While these recent developments are positive Wisconsin continues to lag neighboring states such as Minnesota, Illinois, and Michigan in terms of venture capital invested per capita a key indicator of economic health.



Discussion

The research is clear: the interface between innovation and entrepreneurship drives economic growth and development across the urban-rural spectrum. Within the context of our discussion, innovation is developing new products and processes while entrepreneurship is bringing those innovation to market. Where those two factors overlap is where economic growth and development occurs. As we have seen this can occur through the activities of existing businesses, both large and small, and through new start-up businesses. We have also seen how these innovations can range from what may appear to be simplistic, such as small businesses adopting new ways of conducting business, to radical changes that can fundamentally alter an industry or market.

The key to creating a dynamic and vibrant Wisconsin economy is to create an entrepreneurial ecosystem that embraces and fosters innovation. Fundamental to this desired outcome is the appreciation is that innovation and a vibrant entrepreneurial ecosystem comes from things that people do. Rather it is people working in research at the University of Wisconsin, existing medium and large businesses, budding small new businesses, or even people working on ideas in pre-business settings. The idealized version of the latter is Steve Wozniak tinkering with computers in his garage, but most innovations are more modest where the effects on economic growth and development are cumulative over time.

Because innovation and entrepreneurship are people driven it is crucial that successful policy decisions must be focused on investing in people. This investment can take two forms: long- and short-term. The long-term is centered on investing in education ranging from pre-K or early childhood education, through K-12 and higher education. This investment in education should not be narrowly focused on technical skills but inclusive of problem solving and critical thinking skills. The latter is vital to innovative thinking and the development of new products and processes that can move the economy forward. Too often policy discussions on education favor one area over the other, rather than a balance of the two (technical skills training versus critical thinking and problem-solving skills). In addition, these investments should not be viewed as “finished” with the conferment of a degree or certificate. Rather, continuous learning opportunities across all ages should be focal point of educational

investments. For many rural areas the entrepreneurial ecosystem is driven by older persons (Deller, Kures & Conroy 2019). Here older persons who are in that early retirement age category are often a strong source of new entrepreneurial activity. Continuous educational opportunities aimed at these older entrepreneurs is but one example.

Shorter-term strategies are more focused on immediate opportunities that arise. The research flowing from the Community Capitals framework suggests that innovators and entrepreneurs learn best from others like themselves, and this learning can take place in formal (i.e., continuous learning opportunities) and informal (i.e., networking and mentoring opportunities). As discussed, a primary objective of many public-private partnerships across Wisconsin is to create opportunities for people to network and learn from each other. At the local level this can be a chamber of commerce or other local business organization that sponsors professional development workshops (e.g., latest strategies for social media marketing, basics of business plan development, or new technologies for tracking accounts, among others) that promote networking. These can create stronger bonding social capital amongst local business owners-managers but must at the same time invest in bridging social capital to bring potential entrepreneurs to the table. It is vital that all business owners-managers feel welcomed and embraced within these networks.

Here technical assistance can be offered for early-stage businesses to existing businesses that are struggling to move to the next stage. Many programs exist for early-stage businesses at the local, state, and federal level but a challenge is that many potential innovators and entrepreneurs are unaware of the services available. For businesses that are struggling to move to the next level, programs such as UW-Madison’s Economic Gardening, could be a model to build upon. Here a team of experts work closely with the business for a period of time to help the business move forward. The role of venture capitalists can also be seen in helping these businesses move to the next stage. Venture capitals bring not only the financial resources necessary to the table, generally through assuming partial ownership of the business, but also the technical resources that the business owner and/or management team may lack. Here what the venture capitalist brings to the table overlaps with the objective of the



UW Economic Gardening program: technical skills that the business may lack.

For most pre-venture businesses and smaller businesses, which tends to dominate the Wisconsin entrepreneurial ecosystems, venture capital is not the right “tool” for the problems at hand. Rather these businesses need access to financial credit (e.g., loans, lines of credit) that many traditional financial organizations (e.g., banks, credit unions, etc) are unable to provide. Many times, the financial needs of the business are too modest for traditional financial institutions, the history of the business is insufficient to make adequate risk assessments, or the terms (e.g., interest rates) of any financing are unacceptable to the business. Thus, there is a “credit crunch” for many new and younger businesses. Here communities can form financing opportunities parallel to more traditional financial institutions. These efforts can tap into existing business financing programs offered by state and federal agencies (e.g., the USDA, SBA, or EDA among others) or create local pools of financial resources. Using public tax dollars and/or private investments local economic development organizations can provide seed grants or loans. Rather than debt financing (e.g., loans) local “angel investors” may wish to take small equity positions (i.e., ownership investments) in local businesses. These “angel investors” could serve as silent partners, mentors, or even act as a more involved venture capitalist.

In the end, innovation and entrepreneurship comes from what people do. For many rural Wisconsin communities a long-term strategy around “place-making” could make the community attractive to potential innovators and entrepreneurs. In the research of Deller, Kures and Conroy (2019) on rural migration and entrepreneurship found that early stage retirees relocate to high amenity and quality of life rural communities then start their businesses. It is the amenity and quality of life elements that made these communities attract to these potential entrepreneurs. A long-term and sustainable approach is to invest in the quality of life of the community. Invest in quality schools not with the initial aim of producing a quality workforce but to be attractive to younger families that can feed into the entrepreneurial ecosystem. The Community Capitals framework outline above provide just such a framework to think through how to invest in Wisconsin’s entrepreneurial ecosystem which will foster innovation and economic development and growth.



(Continued from page 26)

without grid power for as many as six days. As a result, we invested in our own natural gas generator. Thankfully, that particular storm didn’t affect our operations.

What resources are you most in need of? How are these different from a metro region?

The biggest resource will be continued access to skilled and talented employees. So far I don’t think that has been more difficult compared to metro regions. Perhaps we even have a better time drawing and keeping talented employees because they find the cost of living here more sustainable.

We rely a lot on county road infrastructure to keep our shipments moving to and from our warehouse smoothly. This can be a unique challenge in the winter, so I have sometimes considered buying my own skid steer or plow to clear snow as needed.

Stabilized energy costs will be important in the long term, but I don’t suspect this to be much different in metro areas. Perhaps metro areas will be more likely to invest in supplementary solar and power storage options.

What do you need to promote/support innovation?

Rural communities will benefit from village and town planning that designates land to business and/or is receptive to business activity. I can see why many businesses are more likely to take their startup to a business park because of better access to guaranteed infrastructure.

I have benefited from guidance from the nearby UWSP small business development center, but I am not sure how many rural innovators are aware of this resource. Access to business guidance and support will do a lot to support innovation.

Cooperation between innovators, successful businesses, and the small business amenities that make living in smaller towns or rural communities more inviting and exciting.

Access to Capital

Commercial loans can be very difficult to access, and the collateral required can be really challenging and risky to contribute. Lines of credit, construction loans, etc. are usually tied to assets and that can be a huge risk.

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