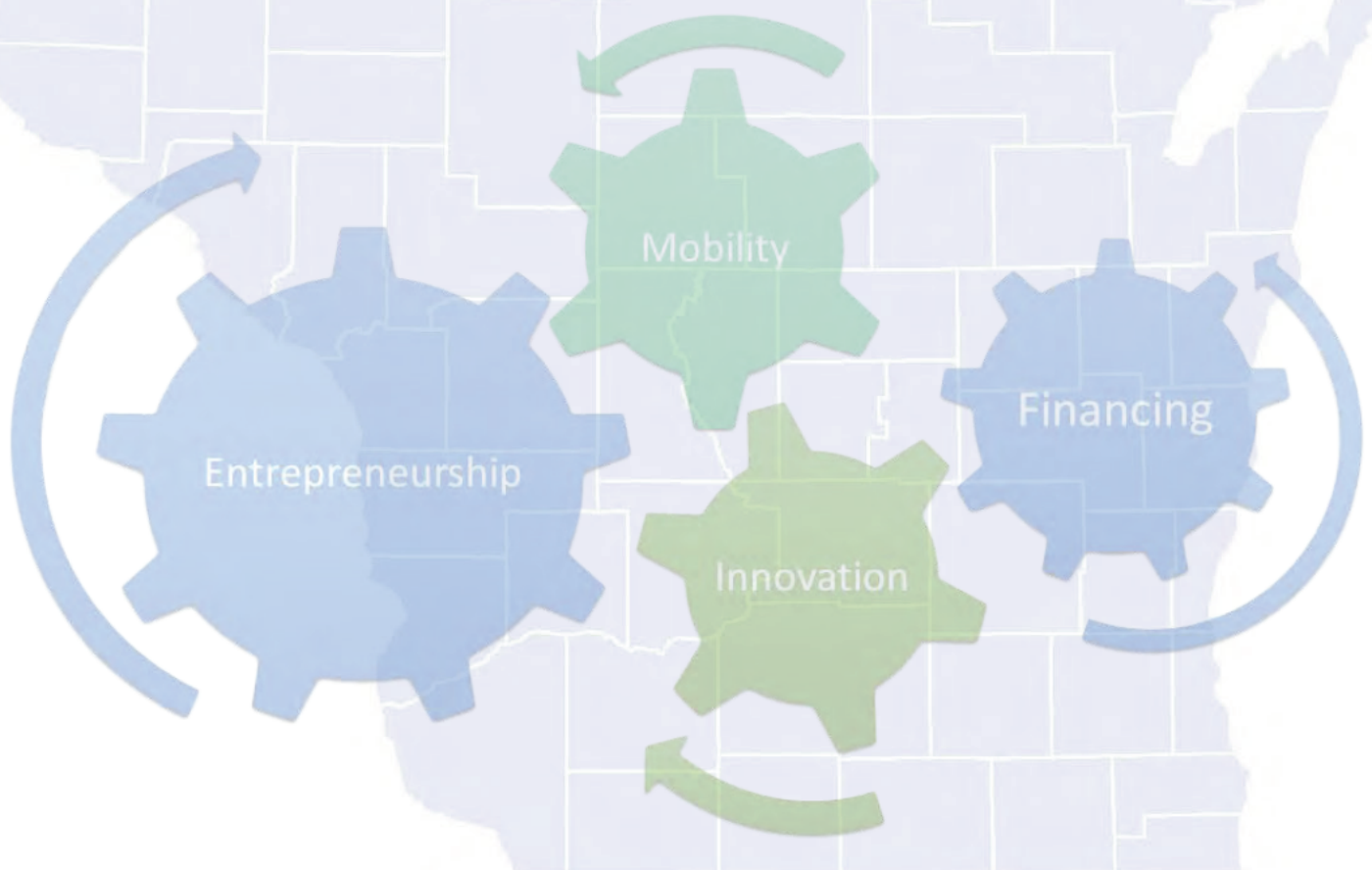


Slow Churn: Declining Dynamism in America's Dairyland

A Special Report on The Wisconsin Economy



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Key Findings

- Since the start of the Great Recession, the death rate of Wisconsin businesses with employees (i.e. employer businesses) has outpaced the startup rate. As a result, after almost three decades of growth, the number of businesses with employees in Wisconsin started to decline in 2007.
- New employer businesses are a critical source of job creation. The low birth rate of these businesses is linked to the slow job recovery coming out of the most recent recession.
- While the number of employer businesses in Wisconsin has declined slightly compared to 2000, nonemployer businesses have increased substantially. This perhaps signals a shift where more and more people are entering self-employment and work for themselves. This coincides with the rise of the “gig economy” where more people are doing freelance work, short-term contract work, or are otherwise employing themselves.
- Mobility has declined nationally. Within the state, the issue of mobility is especially pressing because in-migration is among the lowest in the country. This low in-migration limits a critical source of new ideas and innovation which are important for economic health.
- A decreasing share of resources in Wisconsin is going toward research and development (R&D). While the manufacturing sector conducts the large majority of research and development nationally, Wisconsin manufacturing is dominated by subsectors that are less active in R&D.
- Small business lending declined dramatically during the Great Recession and has yet to recover thus limiting an important source of financial capital for businesses to start and grow. The banking sector has also become increasingly consolidated resulting in both fewer vendors and fewer locations for consumers seeking financial services.



Downtown Mineral Point, Wisconsin

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Key Findings

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Wisconsin's economy, as part of a broad national trend, is becoming less dynamic. Dynamism—the speed and scope at which the economy can change—is measured by business activity, employment patterns, population mobility, spending on research and development, and lending activity by banks. Economic dynamism thus encompasses a number of economic activities—transactions, investments, ventures, and experimentation. It incorporates business openings and expansion as well as closures and lay-offs. It incorporates innovative activity like research and development and capital investments such as that financed by small business lending. It also includes population dynamics such as growth and geographic mobility.

While we often measure the success of an economy based on only a few indicators such as job growth or business startups, these signals are just part of the overall health of an economy. A vibrant economy is driven by a wide variety of activities. Perhaps more so than jobs alone or even entrepreneurship alone, an economy is better measured holistically by its dynamism—the economic activities that signal opportunity and advancement. Ultimately, dynamism summarizes how quickly and how broadly an economy can change (EIG 2017). In a world of rapid progress, the ability to adapt, change, and take advantage of these opportunities is a key component of a strong economy.

Recently, a report by the Economic Innovation Group in Washington, DC highlighted the decline in dynamism at the national level. By their state-level analysis, Wisconsin ranks among the least dynamic states. Indeed, the lack of dynamism in Wisconsin is widespread; the result of fewer businesses opening or closing, referred to as “business churn”, low mobility rates, fewer innovative activities, and less investment. The applied research provided in this report dives deeper into understanding Wisconsin's economic dynamism. We evaluate dynamism based on business behavior—openings and closings, as well as jobs created and lost. We consider population change by looking at growth and two major determining factors, in- and out-migration. Lastly, we use investment behavior to analyze dynamism with data on research and development spending and small business lending. We find that the Wisconsin economy has become less and less dynamic over decades of economic change.

The “Gig Economy”

The “gig economy” is a growing segment of the economy where more and more people are working for themselves often in the form of freelance, temporary or short-term contract work. This is likely partly driven by firms that are choosing to contract services that used to be kept in-house—accounting, human resources, legal, janitorial. The effect is two-fold: Firms get smaller and more people can work for themselves by taking up this contract work. Adding to the trend are companies like Uber and Lyft that rely on these “gig” workers.

The lack of dynamism in Wisconsin is most evident in the slowing churn of businesses. While the number of businesses grew consistently for decades, the number of businesses with employees has actually fallen compared to 2000. This is partly due to the declining birth rate of new Wisconsin businesses since the 1970s. Alongside the birth rate, the death rate of businesses has been falling as well. On its own, a low business death rate may be considered good for the economy as these closures are of course associated with job loss. In the long run, however, research has shown that places with high birth and death rates generate the most jobs. New innovative firms (birth) push out less innovative firms (death) and the net result is higher levels of economic activity and jobs. Research also suggests that when businesses close the owners/managers learn from mistakes and are a more likely to be successful in their subsequent enterprises.

Limited startup activity is important to Wisconsin's local economies because new businesses are a critical source of job growth. The low business birth rate coming out of the Great Recession also means that fewer jobs were created, explaining, at least in part, the slow jobs recovery in Wisconsin since 2009. More and more, Wisconsin is relying on mature firms for jobs. This shift toward employment in older businesses could be problematic as older firms, on net, shed more jobs than they add to the economy.

In a labor market with fewer new job offerings, the opportunities for workers to advance in their careers by moving into a new position are much more limited. For this reason, lower startup activity and the jobs that come with those startups, may explain declining mobility rates. With little reason to pick up and move for a promising job opportunity, people stay in the same place longer. Nationally, mobility rates have been falling since the 1990s and Wisconsin's population, with low rates of both in- and out-migration, is relatively stagnant. Low in-migration combined with the aging demographic and low population growth rate, compounds an already pressing talent attraction and retention issue in Wisconsin.

In addition, investment in research and development, as a share of Gross State Product (GSP), has been falling. These investments in new ideas are a critical component of innovation, which add value and spur growth in local economies. Wisconsin has only a small presence of the industries that account for most of the research and development nationally. Wisconsin's large legacy industries tend to invest modestly in research and development which limits the dynamism of the Wisconsin economy.

Banks too are consolidating, limiting the variety and access to vendors for institutional finance. For years the number of community banks has been declining. While some community banks have been replaced by branches of larger community

BUSINESS DYNAMICS

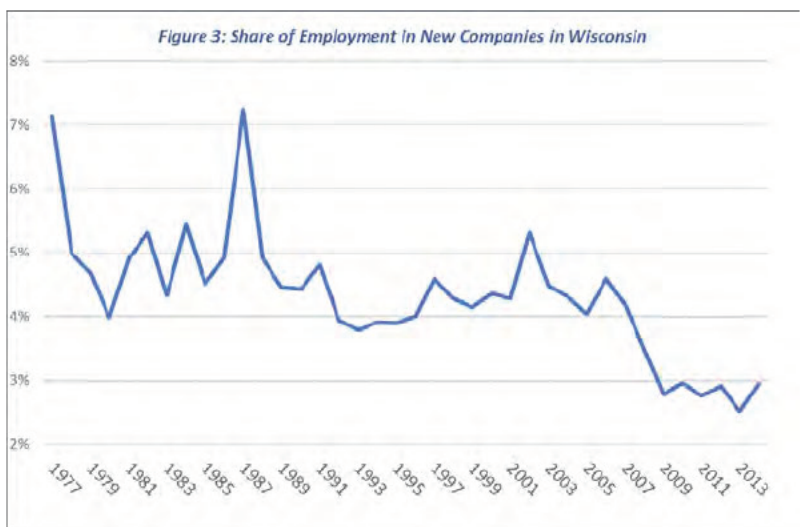
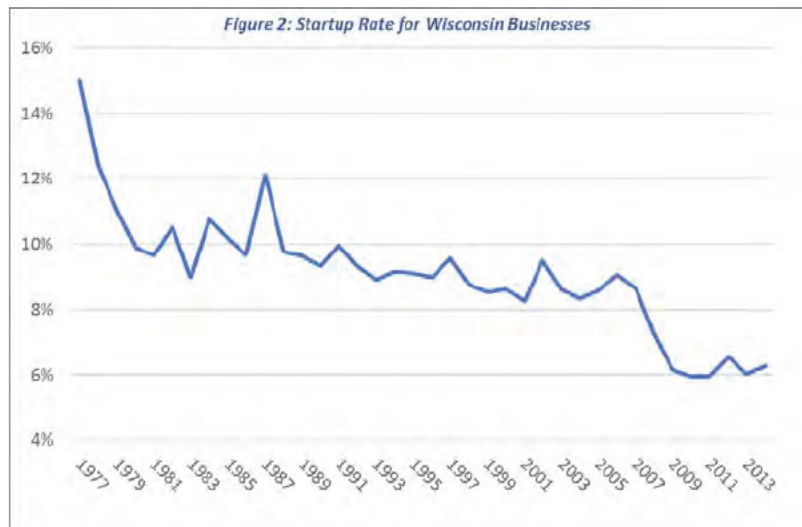
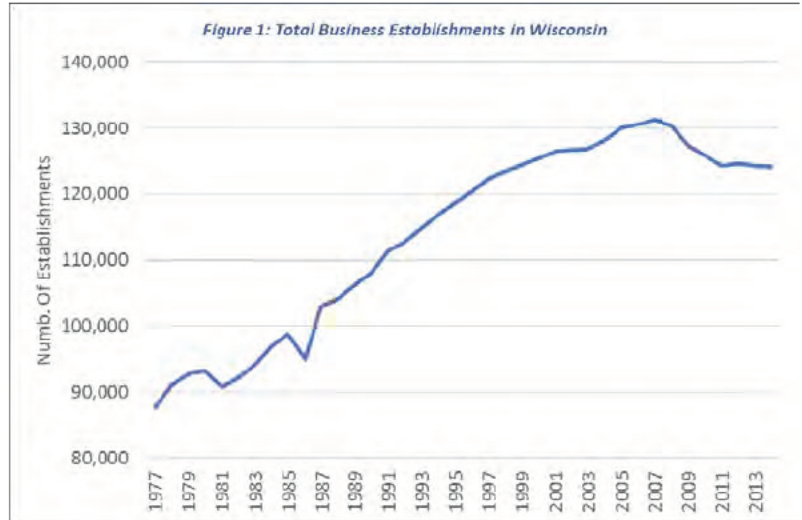
banks, on net, the number of institutions is still declining. The banks we do have are tightening their lending practices, both in terms of the number and size of loans, making it more difficult for new businesses to start and grow since the financial crisis.

While the Recession might appear to be a pivot point for these changing dynamics, many of the trends have long been in motion. These include the broader national shift to a leaner “gig economy”, where more and more people are working for themselves often in the form of short-term contract work, as well as the regional issue of low in-migration. These shifts were exacerbated, but not initiated by, the Great Recession. Even though the decline in small business lending is directly linked to the Recession, the consolidation of the banking sector began more than a decade earlier. In this report we dive into the long-run decline dynamism in Wisconsin through the lens of businesses, population growth, innovation, and lending.

BUSINESS DYNAMICS

The most fundamental component of economic dynamism which has the broadest implications is entrepreneurship. New businesses[1] are vital to the economy as they largely determine the job opportunities that are available and the attractiveness of the state to workers. For several decades, business startup rates have been falling both in Wisconsin and across the nation. Thus, the decline of economic dynamism in Wisconsin is perhaps seen most clearly in the business sector. In Wisconsin, the number of businesses with employees (i.e. employer businesses) rose steadily from fewer than 90,000 in 1977 to a peak of more than 130,000 in 2007 (Figure 1). However, after more than 40-years of expansion, growth slowed to the point of decline with the onset of the Great Recession. Wisconsin lost 6% of employer businesses between 2007 and 2014. In 2014, the state had no more employer business than it did in 2000, despite 7% population growth.

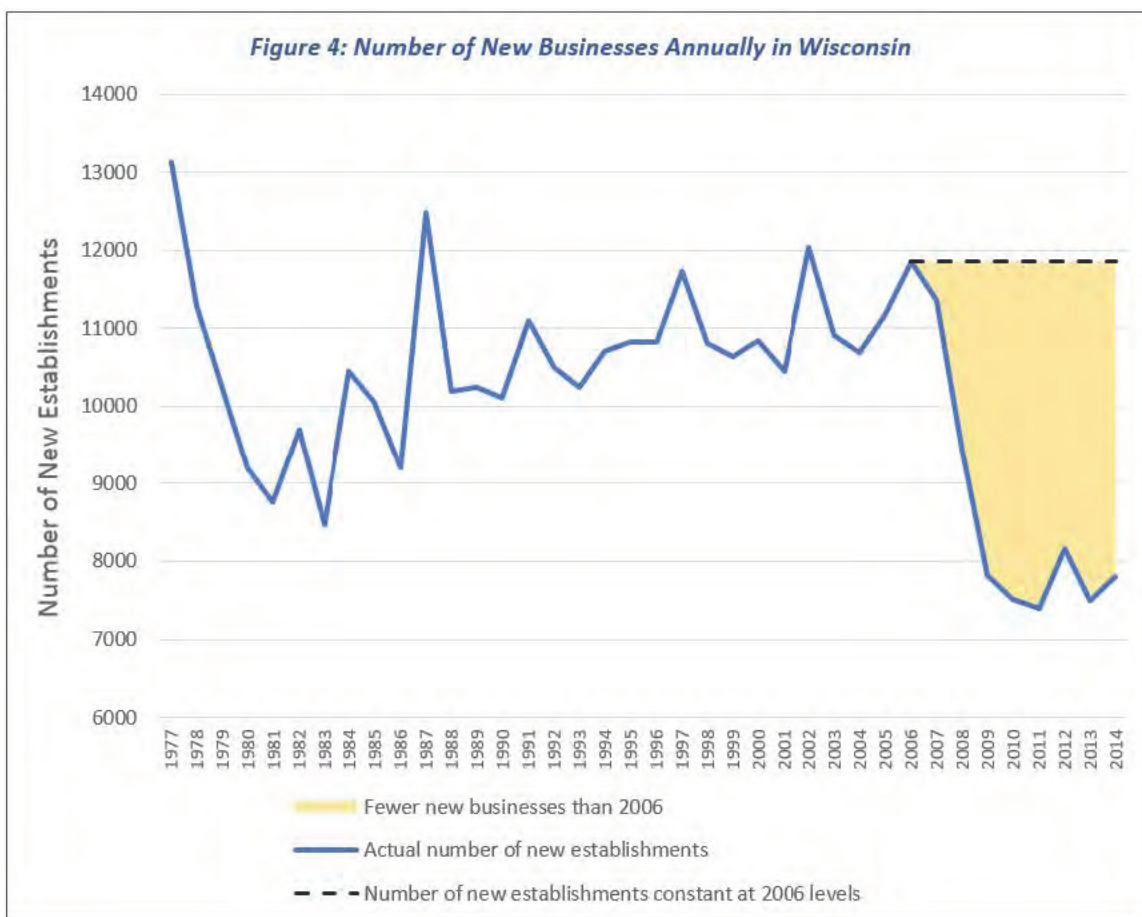
Looking at the number of businesses alone can be misleading without considering the broader economic context in Wisconsin. While the number of businesses increased for decades, this is really just a small net gain resulting from a slightly larger number of businesses opening than closing. A closer look at these business openings and closings, can help us understand the recent decline in the total number of businesses. The startup rate, the number of new businesses with employees relative to existing employer businesses, is especially revealing. As shown in Figure 2, startup rates have been in decline since the 1970s. During the Great Recession, they slowed even further and have yet to show signs of strong recovery.



[1] Businesses as used in this report, generally refers to establishments as opposed to a firm which may have several establishments such as McDonalds.

While it varies by year and region, new businesses are responsible for anywhere from 1 in 3 to 1 in 5 gross new jobs (Conroy and Deller 2015, Decker et al 2014). Further, new businesses generate over 100% of net job creation, meaning new firms more than offset job losses in more mature categories. Startups are thus a critical source of new jobs, making them essential to economic growth. As new businesses have declined in number, so has the share of workers they employ. The share of workers in new businesses (Figure 3) has dropped from peaks of 7% in the 1970s and 80s to about 3% in 2014. New businesses currently employ the smallest share of workers since the 1970s.

Because new businesses are such an important component of job creation, Wisconsin may have regained jobs lost in the Great Recession much sooner had there been more startup activity. In 2014, nearly 8,000 new businesses opened in Wisconsin. That is more than 4,000 fewer than in 2006. In fact, between 2006 and 2014, total new businesses were nearly 28,000 fewer than if the state had remained at pre-recession levels (shaded area in Figure 4). On average, over this time, approximately nine new jobs were created by each business that opened. The lack of new businesses since 2006 translates to over 200,000 jobs that were not created. Clearly, the precipitous drop in startup rates driven by the Great Recession has had a significant impact on employment in the state.



"Indeed, Wisconsin may have regained jobs lost in the Great Recession much sooner had there been more startup activity."

A Note On Data

There are several different data sources that keep track of business dynamics—opening, closing, expansion and contraction—as well as the jobs lost and gained with these changes. Each source has advantages and disadvantages as well as distinct methodology resulting in variation between datasets even for seemingly identical series. The data used for this report are from the Business Dynamic Statistics from the U.S. Census Bureau. The dataset tracks businesses with employees. The BDS data are generated from the Longitudinal Business Database (LBD) which covers firms and establishments starting in 1976. The LBD is built by linking annual information from each establishment in the Census Bureau’s Business Register.

The Business Dynamic Statistics (BDS) have the advantage going back to 1977 which is useful for evaluating long-run trends. It has been used in a number of rigorous analyses of business dynamics (see Moscarini and Postel-Vanay 2009, Haltiwanger et al. 2010) This BDS dataset, however, has the disadvantage that the last release was in 2015. The dataset is being upgraded and is scheduled to resume sometime in the next 18 months.

Alternatively, the Business Employment Dynamics (BED) from the Bureau of Labor Statistics (BLS) similarly (but not identically) tracks business dynamics and associated employment changes. While it does also keep track of business openings and closings as well employment changes, it is based on the Quarterly Census of Employment and Wages and thus does so on a quarterly basis. The quarterly release includes gross jobs gained and lost from business activity. More recently, these data have been compiled into national and state-level tables detailing annual employment changes by firm age and size and industry.

This data is comparatively new, having come out in its early form in 2003. It has become more detailed since its first release with added data by sector, firm, and state as well as eventually by age. It goes back to 1992, making it much shorter than the BDS, but has the advantage of being relatively up-to-date with data for 2017 already available. Given the variation between data and the delayed release of the primary data for this report, it is important to consider the BED. For comparison, we’ve included alternative versions of Figures 4 and 8. In general, the BED follows a similar pattern to the BDS in years since 1994 when it started. The BED data compared to Figure 4, however, does seem to suggest fewer births in the late 1990s and leading up to the recession as well as an earlier and complete recovery. The BED data compared to Figure 8 suggest larger gains in expansionary years, including those since 2012, as well as larger losses during contractionary periods. These differences are difficult to reconcile with a number of methodological factors to consider as well delayed release of the BDS. Until the BDS used for this report is released for more recent years, it will be challenging to assess the strength of the recovery.

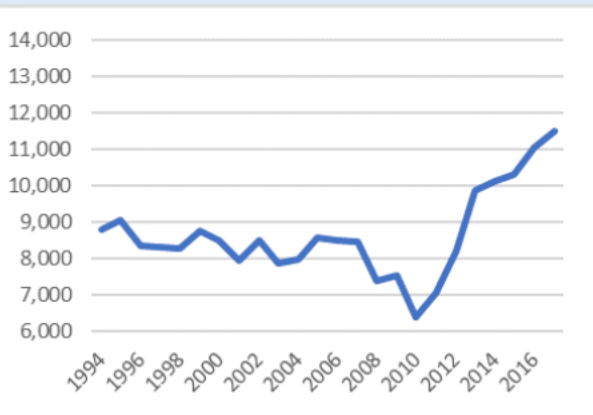


Figure A4: Number of New Businesses Annually in Wisconsin

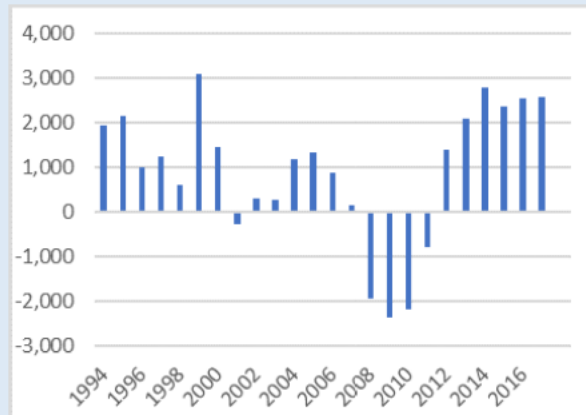


Figure A8: Annual Difference between Establishment Births and Deaths in Wisconsin

As the startup rate of employer businesses has slowed, there are indications of what is perhaps the more interesting underlying trend in Wisconsin: the changing structure of the business sector itself. The decline in employer businesses seems to be offset by more and more people working for themselves, as measured by the number and share of businesses without employees (nonemployer businesses). Figure 5 shows significant growth in nonemployer businesses in 2009 and 2015 relative to 2000 in Wisconsin. While the increase is large, Wisconsin is actually lagging behind national averages (Figure 6). This apparent transition to what some have referred to as a “gig economy” is harder to track. Nonemployer businesses, often without storefronts operating out of a home-based office, and not subject to payroll taxes, evade the conventional methods of identification. Still, existing evidence suggests that as employer businesses decline in number and size, nonemployer businesses are rising in their place.

“...the positive effect of churn, the process of business openings and closures, is that these ventures produce useful market signals: business owners can learn which products and methods work well...and which do not.”

STARTUP ACTIVITY IN WISCONSIN

In Wisconsin, the rate of establishment births has been falling steadily since the 1970s. This decline has compounded the already below-average start-up activity in the state (Figure 7). This lag in entrepreneurial activity may be partly related to Wisconsin’s concentration in legacy industries, such as metal product, paper, and wood manufacturing. Due to the amount of capital and scale required for entry, these business sectors have historically low birth rates. Yet, Wisconsin’s startup rate was highest in the 1970s and 1980s, when manufacturing was also thriving, suggesting factors apart from the state’s industrial composition affect its entrepreneurial outcomes.

In addition to the business birth rate, the death rate of establishments is an important component of economic dynamism. While the failure of a business is accompanied by direct losses, closure is part of an active and innovative business sector. As businesses experiment and take risks, some number of ventures will be unsuccessful while others will discover new niches. As part of the process of experimentation, failures are a component of a healthy growing economy. Over time, the places that have both high birth rates and high death rates tend to exhibit stronger economic performance, a pattern that has been observed since at least the 1980s (Birch 1981, 1987, Bunten et al 2015).

Part of the positive effect of churn, the process of business openings and closures, is that these ventures produce useful market signals: business owners can learn which products and methods work well...and which do not. This informational component of business activity increases with business successes, of course, but also with failures as business owners can see which strategies and potholes to sidestep in their own projects. In this way, closures offer important lessons to subsequent entrepreneurs about which paths to avoid. Thus, the birth rate, coupled with the death rate, can indicate a path for entrepreneurs that leads to more successful ventures and higher job growth in the future (Bunten et al. 2015).

Figure 5: Change in Employer and Nonemployer Businesses in Wisconsin Since 2000 as A Percent of 2000 Levels

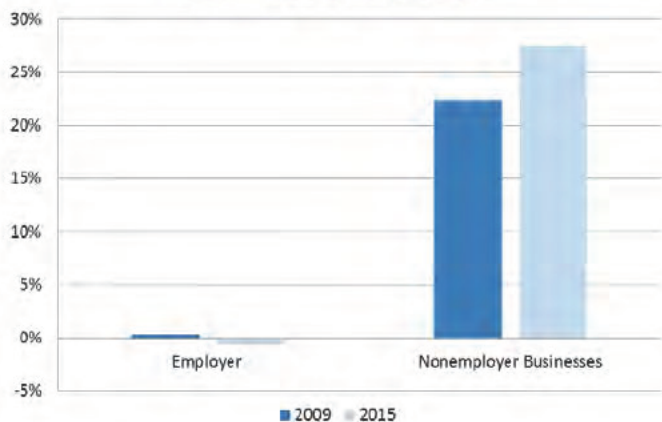


Figure 6: Nonemployer Businesses as A Share of Total

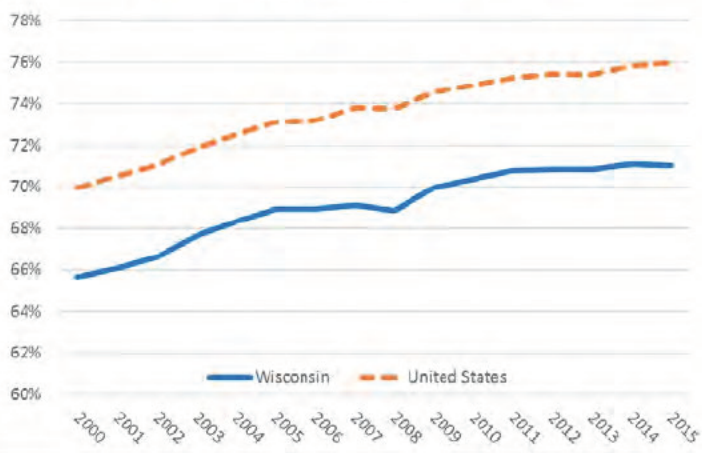
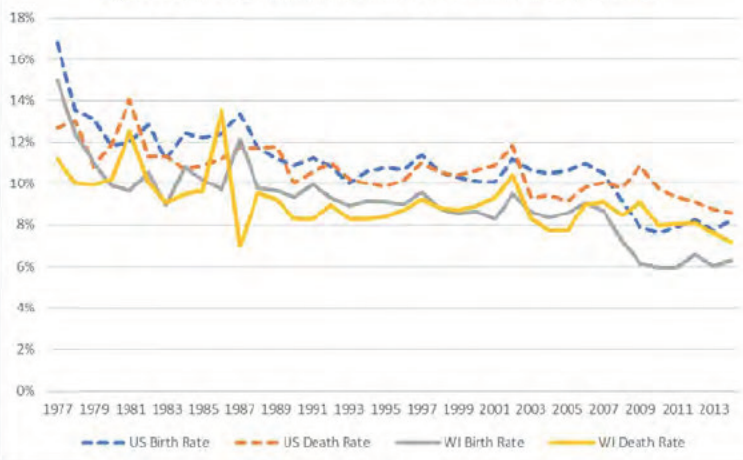


Figure 7: Business Birth and Death Rates in Wisconsin & the United States

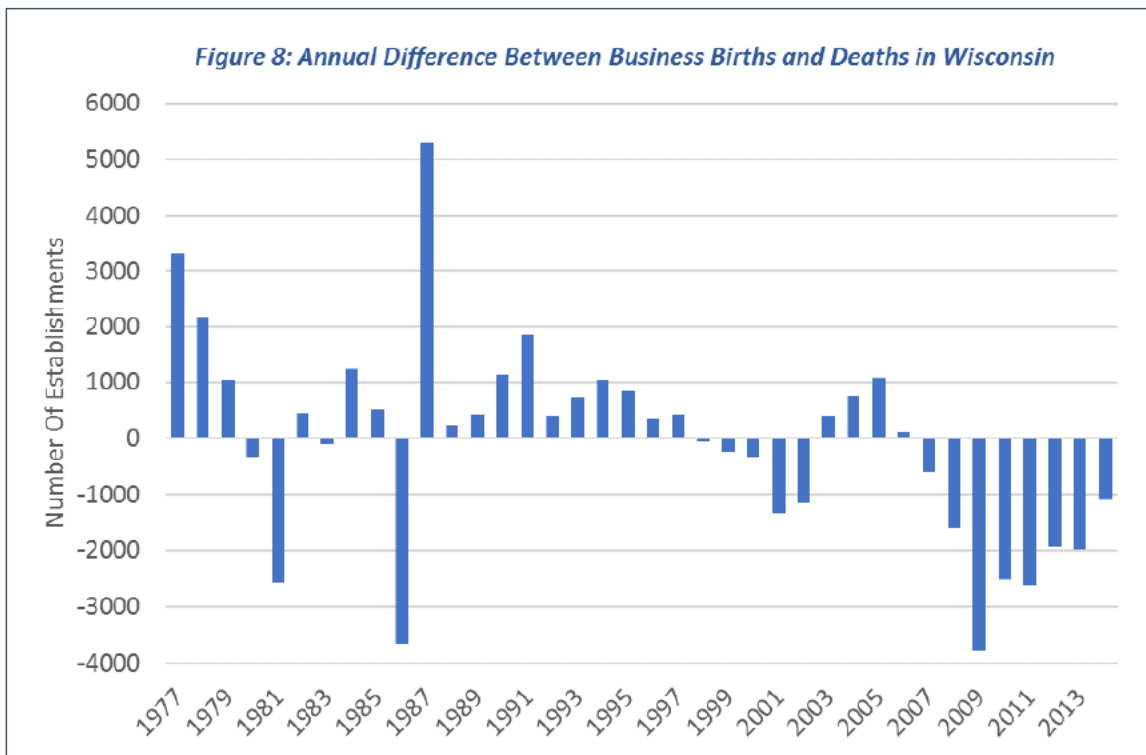


In Wisconsin, just as birth rates of employer businesses have been trending downward so too have death rates. Not only does this limit the market information available to future entrepreneurs as previously described, this can also stymie the benefits of competition. With little competitive pressure from new firms entering the market, older firms have little incentive to invest in improvements and innovation themselves. Some of these marginal businesses probably would not survive in a more competitive environment where they would be pushed out by a more innovative firm offering a better product or service. Thus, low establishment death rates, just like low establishment birth rates, may signal less innovative economies that do not advance as quickly as more dynamic economies.

While churn, active entry and exit by businesses, is part of a strong regional economy, growing the business sector does require the

number of new businesses to exceed those that close. Prior to the Great Recession, with the exception of a few volatile patches, birth rates exceeded death rates in Wisconsin leading to fairly consistent growth in the number of businesses over time. However, as can be seen in Figure 7, death rates surpassed birth rates by a relatively wide margin and long period during the Great Recession.

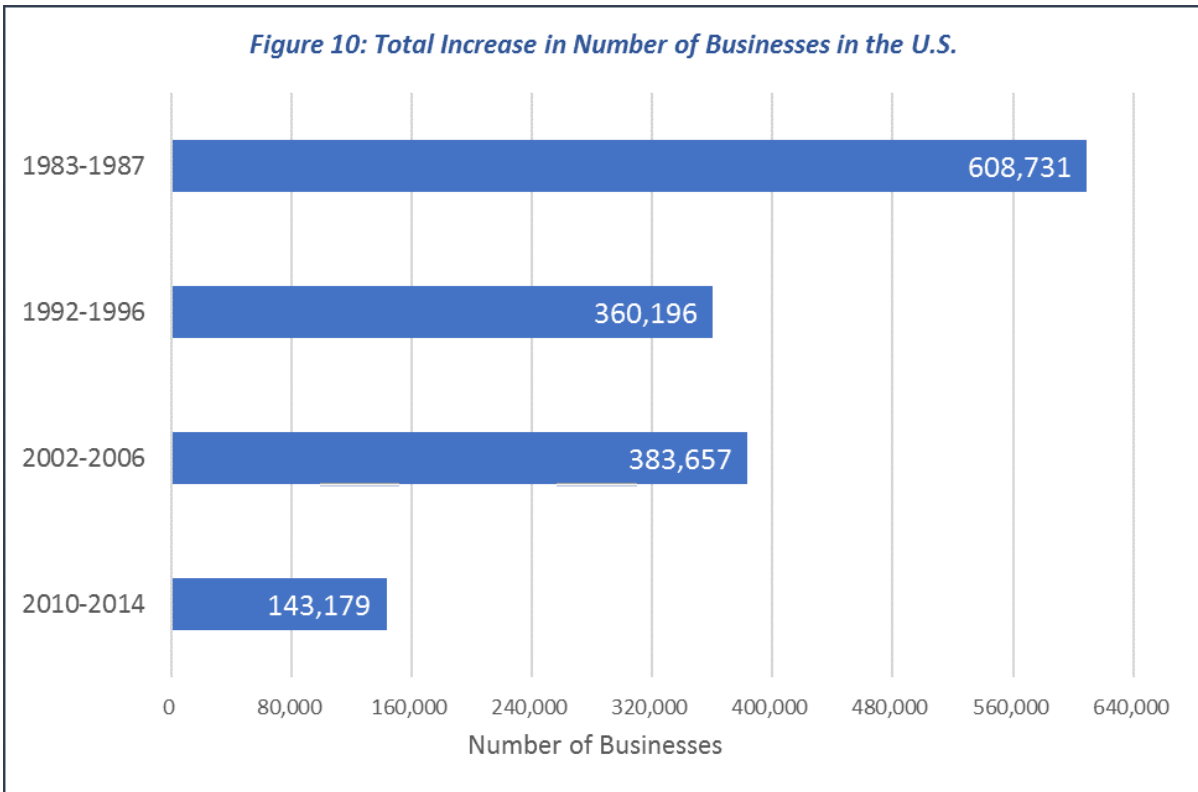
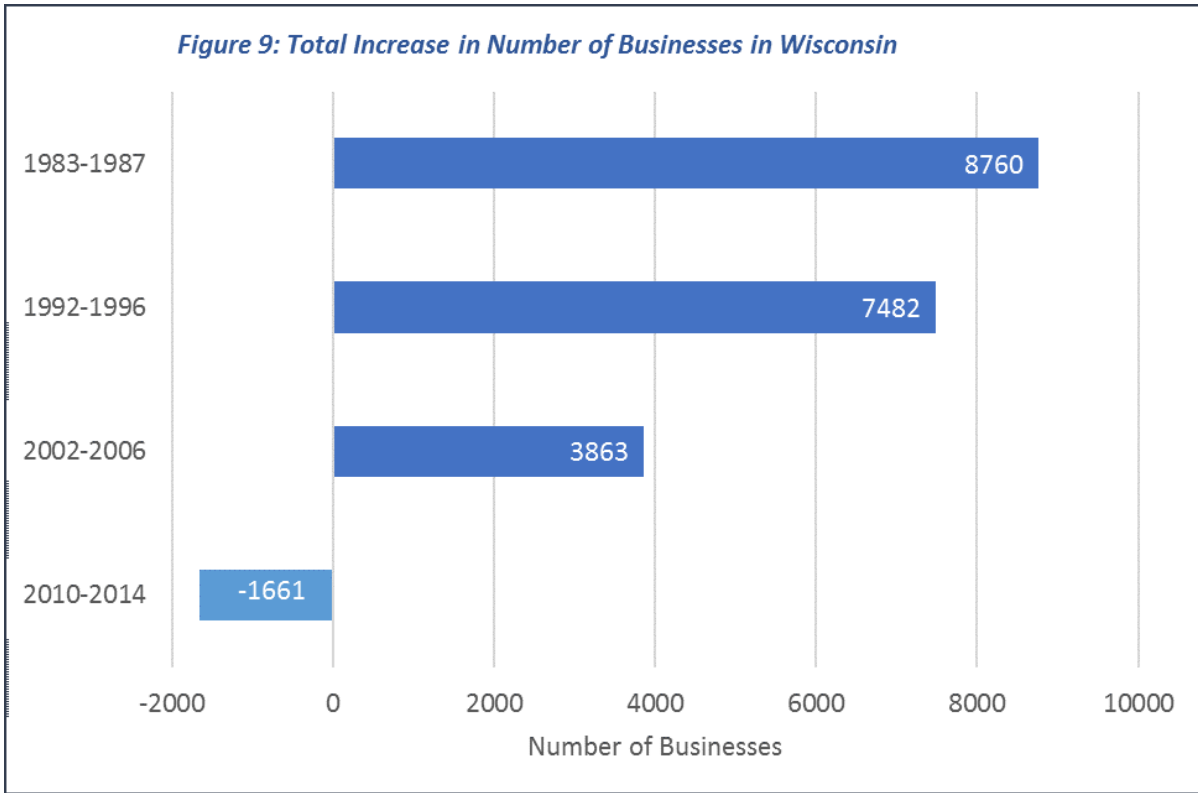
These differences between business births and deaths in Wisconsin are shown more precisely in Figure 8. In general, the net change in businesses has reflected national economic trends, with business losses during economic downturns and growth during expansions. In fact, entrepreneurs play an important role in the business cycle—coming out of recessions, rising entrepreneurial activity is one of the first signs of recovery that leads to more hiring and more spending, and ultimately economic growth (Koellinger and Thurik 2012).



Volker Disinflation

In the late 1970s, the Federal Reserve Bank, under newly appointed chairman Paul Volker, made reigning-in high inflation a top priority. The change in monetary policy, primarily through increased interest rates, drove investment down and led to a recessionary period in the early 1980s. This can be seen in nearly every figure in this report and became known as the Volker disinflation (Bordo et al. 2007). It successfully reversed inflation patterns at the short-term cost of higher unemployment and lower economic activity.

As the birth rate has declined over the last five decades, recoveries have become weaker and weaker (Figures 9 and 10). In the mid 1980's, the economy took a downturn following the Volker disinflation and recovered quickly with a much lower inflation level. The strength of this recovery, both in Wisconsin and at the national level, was indicative of the economy's ability to rebound at the time, led in part, by entrepreneurial activity. As mentioned above, the high business churn during the 1970s and early 1980s was a key feature of this resilience. The Great Recession was different. Unlike the short, steep recessions of the 1980's, startups did not immediately bounce back. In fact, years later, Wisconsin continued to shed businesses, in spite of the combination of fiscal stimulus and low interest rates through aggressive monetary policy by the Federal Reserve Bank.



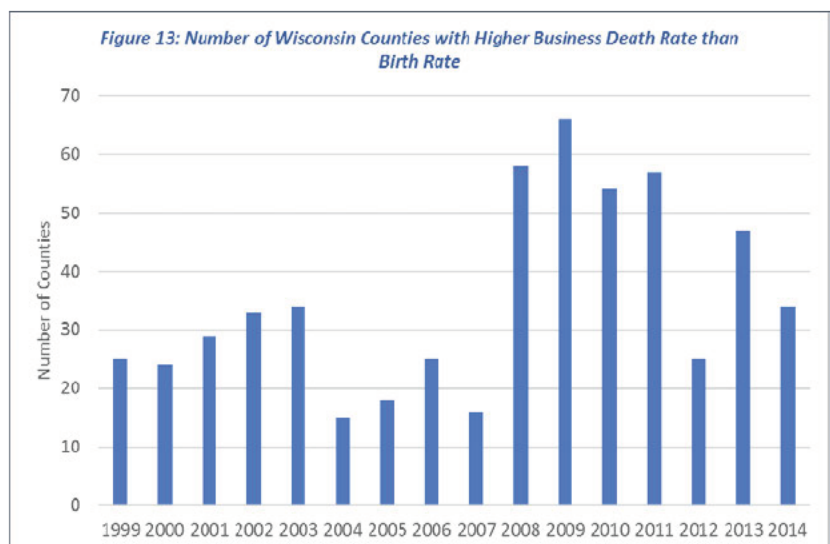
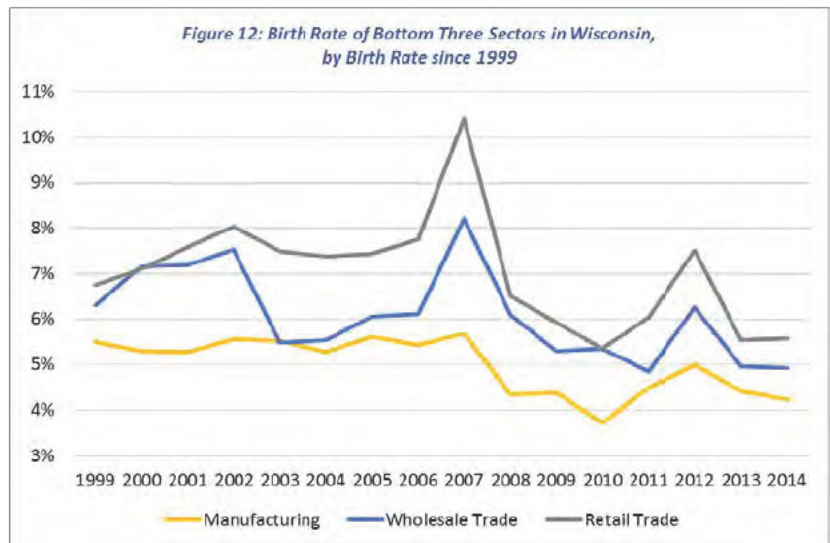
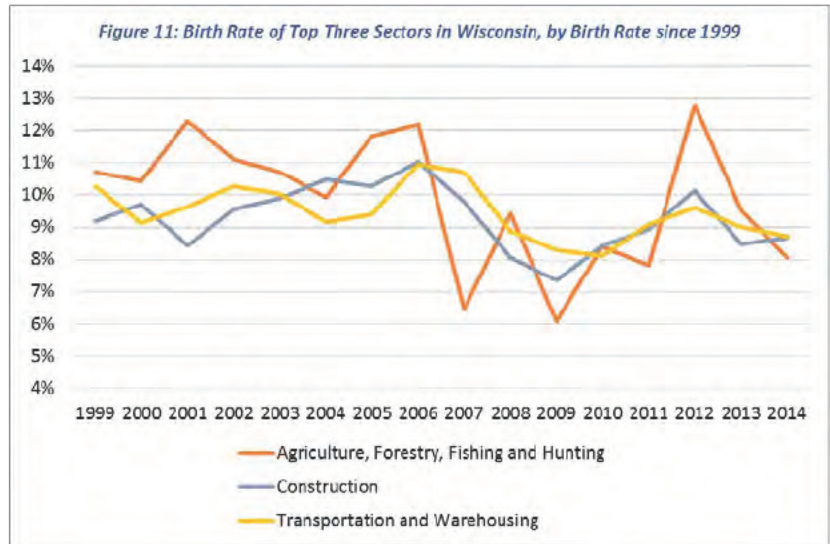
COUNTY AND INDUSTRY STARTUP DYNAMICS

In the next section, we take a closer look at economic dynamism shifting from the state as a whole to exploring comparable data for Wisconsin counties and individual industrial sectors. In this finer detail, it is clear that the set of challenges facing startups in Wisconsin is pervasive, spanning both industrial sectors and geographic regions across the state. That is to say, the decline in dynamism is not an isolated trend in one part of Wisconsin or one particular industry. Over the last 15 years startup rates have declined across sectors, from those with the most startup activity to those with the least.

The top three sectors for startup rates in Wisconsin (Agriculture, Forestry, Fishing & Hunting; Construction; Transportation and Warehousing) peaked in 2006 before plummeting during the Great Recession, in the case of agriculture, to nearly half its value (Figure 11). While these rates have recovered somewhat, they have not returned to pre-recession levels. Similar trends for the bottom three economic sectors for startup rates in Wisconsin (Manufacturing, Wholesale Trade, and Retail Trade) are noted in Figure 12. Given the historical, or legacy, importance of manufacturing to Wisconsin, the low and declining startup rate is of particular concern.

The widespread decline seems to contradict some potential explanations for the decline of dynamism. In particular, these declines have come during a period of compositional change towards an increasingly more service-based U.S. economy. As service businesses are less capital intensive, local, and specialized, we might expect this change to actually increase startup activity (EIG 2017). Arguably, changes to retail, specifically productivity enhancements that would reduce demand for small, labor-intensive startups, could lower the startup rate but even this effect should have dissipated by now (Foster 2006). Thus, the decline in startup activity is all the more curious, as it is contrary to expectation with little explanation.

For years before the Great Recession, fewer than half of Wisconsin counties had establishment death rates that exceeded birth rates (Figure 13), and thus had net growth in the number of businesses. Over the last two decades, the number of counties in Wisconsin where establishment death rates exceed birth rates has increased particularly with the recession so that in some years half or more of Wisconsin counties have lost businesses on net.



These net losses are largely due to declining births, rather than increasing deaths. That is, counties are suffering more from a lack of entrepreneurship than high business failure rates. This low birth rate is important for understanding the potential problem. It doesn't appear that once businesses have started that they are facing an especially harsh environment. Instead, getting started in the first place may be the real challenge—perhaps because of capital constraints, but even less obvious factors like health insurance and childcare can constrain entrepreneurial potential (Conroy, 2018).

The 20 Wisconsin counties with the highest startup rates over the early recovery period following the Great Recession (2010-2014) are provided in Table 1. [2] It is expected that counties like Dane (home to Madison) and Milwaukee (home to the city of Milwaukee) have higher business activity due to the benefits of agglomeration economies such as supply chain linkages and demand from a large local population. Interestingly, several rural counties like Rusk and Vilas also rank highly. Natural amenities such as miles of lakefront property make many northern Wisconsin counties popular destinations for retirees. The result is that these counties are home to an older population which has, on average, accumulated both human capital from years of work experience and financial capital from saving, investment, and accumulated home equity. This pool of skilled retirees has significant entrepreneurial potential. Many have traditional resources, time, money to invest, and, though they may have left traditional employment, a desire to be productive. Given this demographic feature of some rural counties, perhaps their entrepreneurial tendency is unsurprising.

While it seems that both rural and urban counties can be highly entrepreneurial, a lack of entrepreneurial activity seems to be a

primarily rural issue. The 20 counties with the lowest average startup rates over the early recovery period following the Great Recession (2010-2014) are almost entirely rural (Table 2). Because new businesses provide such a large share of new jobs, the low rate of start-up activity in rural parts of the state is likely linked to the slow recovery from the recession in these areas.

In the midst of ongoing discussions about the rural-urban divide, the distribution of economic dynamism across Wisconsin is especially relevant. With high-performing entrepreneurial regions becoming both fewer in number and more concentrated in metropolitan areas, already lagging distressed communities, many of them rural, are falling even further behind (EIG 2017). This divergence is likely a factor in the real and important economic gap between rural and urban areas. The rural areas that do have a high startup rate, like Rusk and Vilas counties, demonstrate that rurality is not necessarily a limiting factor. Rural areas do have the potential to be entrepreneurial, suggesting that it may be possible to narrow these economic gaps.

While urban areas are doing better than rural areas in Wisconsin, they still lag behind other urban areas across the nation. According to EIG, the 20 metro areas with the lowest average rates of firm formation in the country, from the same period as our study, were small urban locations in the "Rust Belt" including some in Wisconsin. These regions with a strong industrial legacy suffer from low birth rates much more than from high death rates as described above. In fact, death rates are generally below the national average in these cities; it is the low startup rate that defines their lack of dynamism.

"Natural amenities such as miles of lakefront property make many northern Wisconsin counties popular destinations for retirees. The result is that these counties are home to an older population which has, on average, accumulated both human capital from years of work experience and financial capital from saving, investment, and accumulated home equity. This pool of skilled retirees has significant entrepreneurial potential. Many have resources, time, money to invest and, though they may have left traditional employment, a desire to be productive."

[2] Full table of counties available in the appendix.

County Name	Average Startup Rate	Average Death Rate	Average Annual Startups	Average Annual Deaths
Menominee County	12.5%	7.8%	3	2
Rusk County	8.8%	8.0%	28	25
St. Croix County	8.2%	7.7%	172	162
Pierce County	8.1%	7.8%	63	61
Chippewa County	8.0%	7.3%	124	112
Florence County	7.9%	10.5%	8	11
Vilas County	7.9%	9.2%	74	86
Vernon County	7.9%	8.3%	49	51
Eau Claire County	7.9%	7.5%	212	201
Milwaukee County	7.9%	8.4%	1538	1651
Kenosha County	7.9%	8.2%	238	248
Dane County	7.8%	7.4%	1038	987
Adams County	7.7%	8.3%	25	27
Bayfield County	7.7%	7.6%	33	33
Jackson County	7.6%	7.3%	32	31
Dunn County	7.6%	7.8%	68	70
Monroe County	7.6%	7.1%	72	68
Buffalo County	7.4%	8.0%	24	26
Clark County	7.4%	7.3%	54	54
Forest County	7.4%	7.6%	18	19
Wisconsin	7.2%	7.6%	9898	10444

Table 1: The 20 Wisconsin Counties with the Highest Average Startup Rates Over the Recovery (2010-2014 Averages)

County Name	Average Startup Rate	Average Death Rate	Average Annual Startups	Average Annual Deaths
Langlade County	4.8%	6.2%	27	35
Dodge County	5.8%	6.9%	102	121
Wood County	5.8%	6.7%	104	120
Fond du Lac County	5.9%	6.9%	141	164
Manitowoc County	5.9%	6.5%	106	116
Lincoln County	6.0%	6.9%	41	47
Ashland County	6.1%	8.0%	32	42
Sheboygan County	6.1%	6.6%	164	177
Green County	6.2%	6.1%	58	57
Winnebago County	6.3%	7.0%	221	248
Grant County	6.3%	6.5%	77	79
Lafayette County	6.4%	6.7%	23	24
Marinette County	6.5%	7.2%	71	80
Price County	6.5%	8.1%	28	35
Waupaca County	6.5%	7.5%	79	92
Door County	6.5%	7.0%	84	91
Richland County	6.5%	7.1%	24	26
Calumet County	6.5%	6.7%	57	59
Douglas County	6.5%	7.2%	68	75
Marathon County	6.7%	7.5%	222	249
Wisconsin	7.2%	7.6%	9898	10444

Table 2: The 20 Wisconsin Counties with the Lowest Average Startup Rates Over the Recovery (2010-2014 Averages)

[2] Full table of counties available in the appendix.

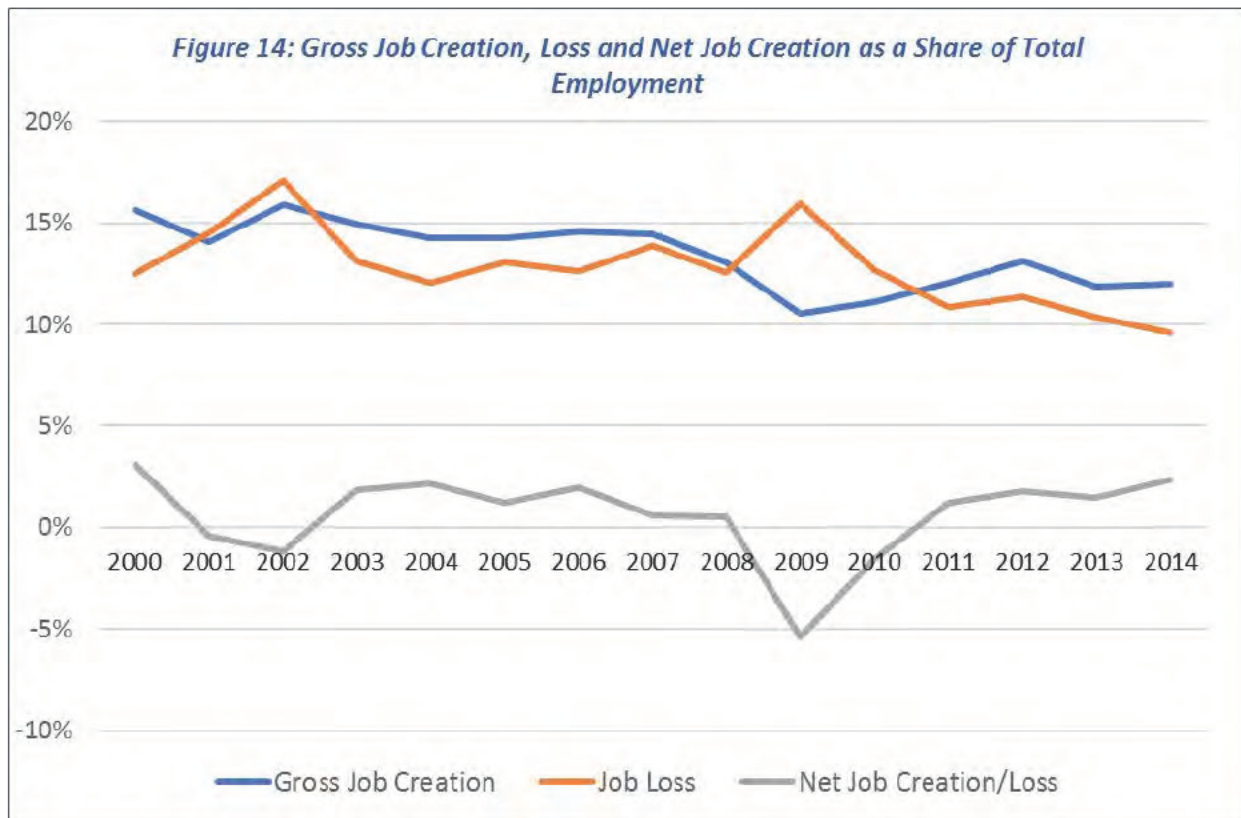
EMPLOYMENT DYNAMICS

EMPLOYMENT DYNAMICS

Often economic development policies focus on jobs, making it important to explore how changes in employment fit into the broader context of an economy. The research suggests that employment growth is inseparable from business dynamics. The small net change in jobs in any given month is the result of an ongoing process of business dynamics—firms opening, closing, expanding and contracting. Net new job creation in the economy is the slim difference between gross job creation and gross job loss.

In Wisconsin, nearly 10,000 businesses open and create jobs each

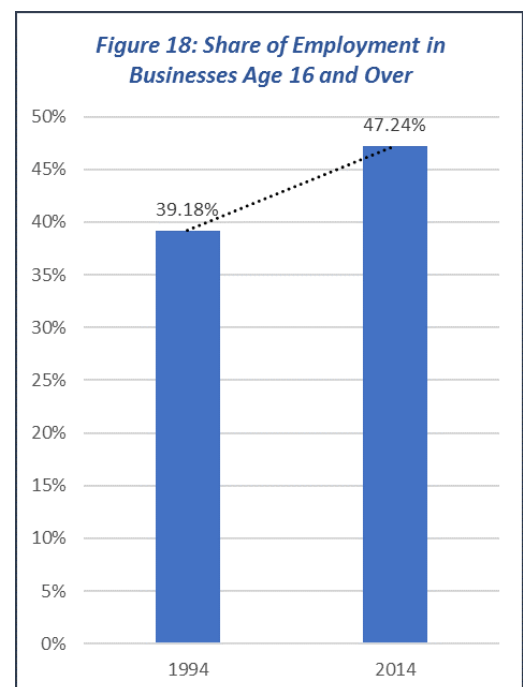
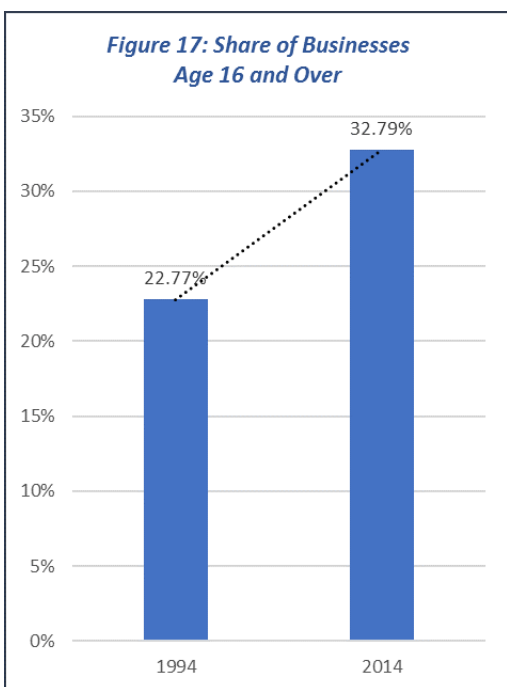
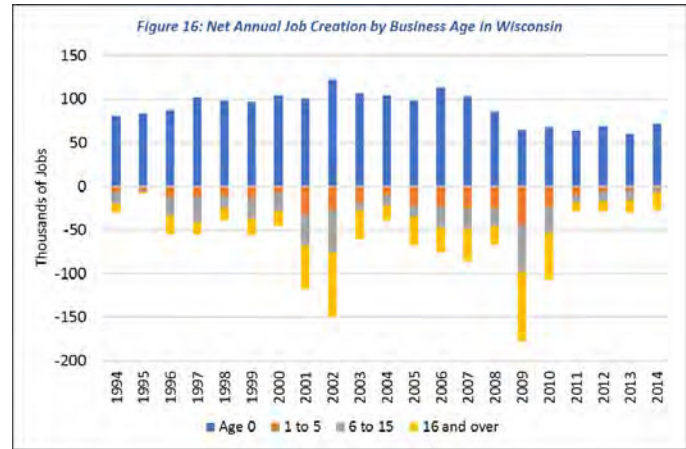
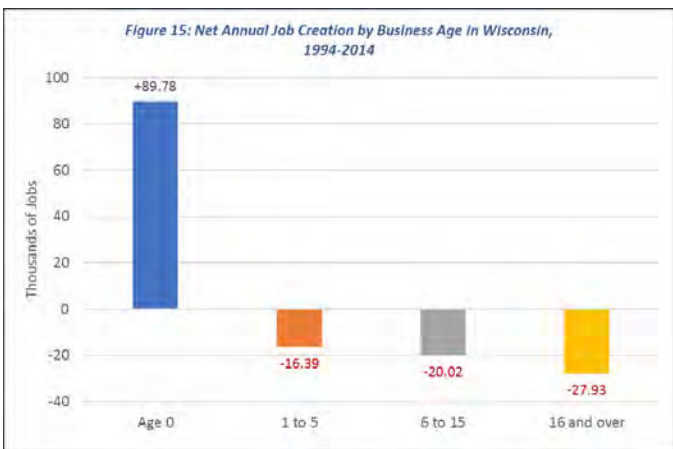
year (Table 1). Roughly another 10,000 close each year, taking jobs with them. In addition, if existing firms expand they add new jobs and if they downsize they take away existing jobs. The net jobs effect of these processes is quite small compared to the gross activity (Figure 14). Generally, gross job creation at least slightly exceeds gross job loss, resulting in positive net job growth. During the recession, however, gross job loss exceeded job creation, leading to pervasive joblessness. Lately, this is largely explained by the decline in startup activity and younger small businesses which drive job creation (Haltiwanger 2015, Decker et. al 2014).



“Often economic development policies focus on jobs...the research suggests that employment growth is inseparable from business dynamics.”

Taking a long-run view of net job creation, which incorporates potential losses from layoffs and closures, we show average annual net job creation by establishment age in Wisconsin, over the last several decades in Figure 15. The large role played by startups relative to incumbent firms is particularly striking. As shown in Figure 16 where year-to-year job creation by establishment age is plotted from 1994 to 2014, older firms' contribution to net job growth has been negative in every year. So, while these mature, and often larger, firms are very important for maintaining existing employment, their impact on job creation, over and above current jobs, is minimal if not negative. In essence, existing businesses in Wisconsin are shedding more jobs than they are creating. It is also clear how labor market conditions are closely linked to startups, especially during the Great Recession when both startups and job creation slowed dramatically.

With fewer new businesses in the state (shown in the previous section), incumbent or existing, mature firms are accounting for a larger and larger share of the market. This means incumbents represent a growing share of all business (Figure 17) and that they are employing more and more of the workforce (Figure 18). While mature firms provide stable employment for their current employees, this shift toward relying more on "older" business could be problematic for two reasons. First, mature firms create fewer new jobs on net than startups thus limiting job growth as made clear in Figures 15 and 16. This difference is largely because, in the life cycle of a typical firm, it will add employees as it grows and expands in its relatively young stage, but stabilize and make only small employment adjustments in maturity. Second, productivity growth is lower in older businesses which places downward pressure on total output as well as wage growth for workers.



For local Wisconsin economies, these results have strong implications. Places with a large presence of mature firms and little entrepreneurial activity are likely to see less job growth than places with more startup activity. In larger, mature businesses there may be plenty of stable jobs for workers who are currently working there but little potential to add new jobs. Further, with thin labor markets compared to states with large metro areas and a more dynamic business sector, the prospect of attracting new residents to Wisconsin communities, which is already a challenge, is all the more serious.

Labor market flexibility is another traditional way of measuring economic dynamism. The job turnover rate, the share of workers beginning or ending employment each year, is a good measure of this flexibility. Higher turnover rates are typically associated with stronger, more dynamic economies where workers feel comfortable leaving their job to move into jobs that are better suited to their skill sets, offer better wages and perhaps benefits, or fit their personal needs. Conversely, when workers perceive few opportunities and little chance of improving their situation, they tend to stay in the current job. While high job churn, in the form of high employee turn-over rates, may be costly to businesses that are losing employees, it is a signal of a stronger more dynamic economy. Businesses with high turn-over rates may want to explore reasons why this might be the case and implement strategies to retain, and attract, quality employees. In aggregate, though, turnover is usually associated with a favorable labor market for workers.

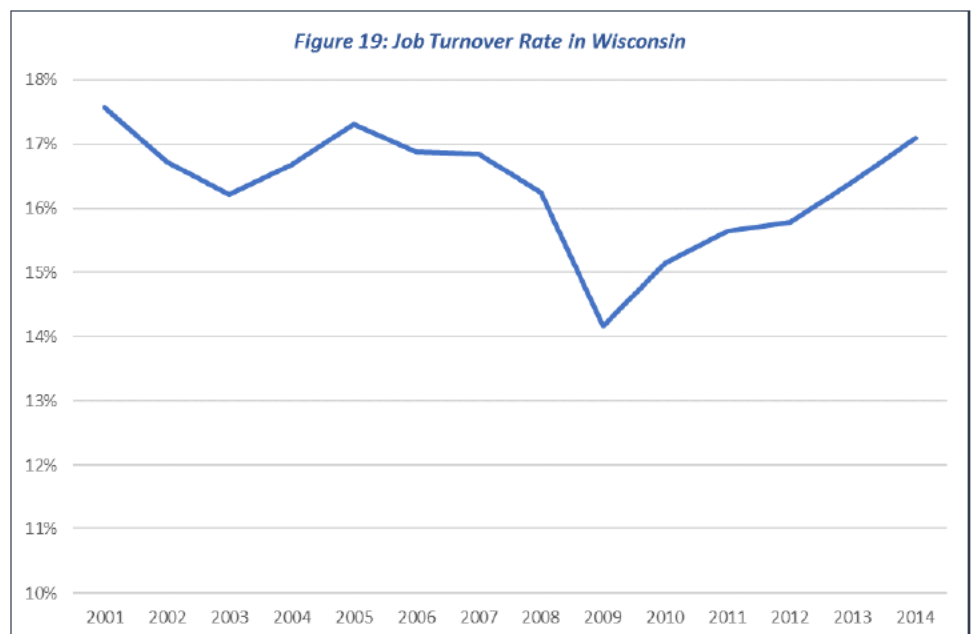
As would be expected, the job turnover rate bottomed out during the Great Recession (Figure 19). As the economy has recovered the job turnover rate has increased. At first glance, this seems like a good sign for the Wisconsin economy. But, it is important to keep in mind other trends that were occurring simultaneously, such as a business death rate that exceeded birth rate. In other words, the job

turnover rate may be increasing for reasons counter to what economic intuition would suggest. With more establishments closing than opening, it is possible that workers are changing jobs not because they want to pursue opportunities but because their current employer went out of business and their job no longer exists.

When a worker does seek a new job, either because they have to or choose to, it matters which new job they take. With a lack of jobs in new businesses, workers are more likely to move into an older firm, which gives way to another set of issues for workers, namely productivity and wage growth (Shambaugh et al 2018). Wage growth relies on productivity growth—workers get paid more as they are able to produce more with less. Most labor productivity growth occurs in young firms. In fact, labor productivity growth slows by two-thirds within the first five years of a firm (Alon et al. 2017). By ten years of age, productivity growth goes to zero. This productivity trend implies that the best jobs may be in younger firms. If more workers are working in older firms, the regional growth implications are fairly stark. Regions that are dominated by more mature firms are likely to see lower productivity growth than regions with a larger presence of younger firms. The large share of low-to-zero productivity growth mature firms can then also put downward pressure on wages (Stansbury and Summers 2017).

Additionally, downward pressure on wages may come from there being less competition for workers between businesses, which reduces workers' bargaining power. As workers receive fewer outside offers, their position to either pursue wage-enhancing negotiations or transition to a new position is weakened. With the long-run decline in startup activity and potentially thinner labor markets, workers are left with less bargaining power and few other routes to increase their wages. Thus, the decline in startup activity may be linked to the relatively tepid wage growth observed since the 1980s.

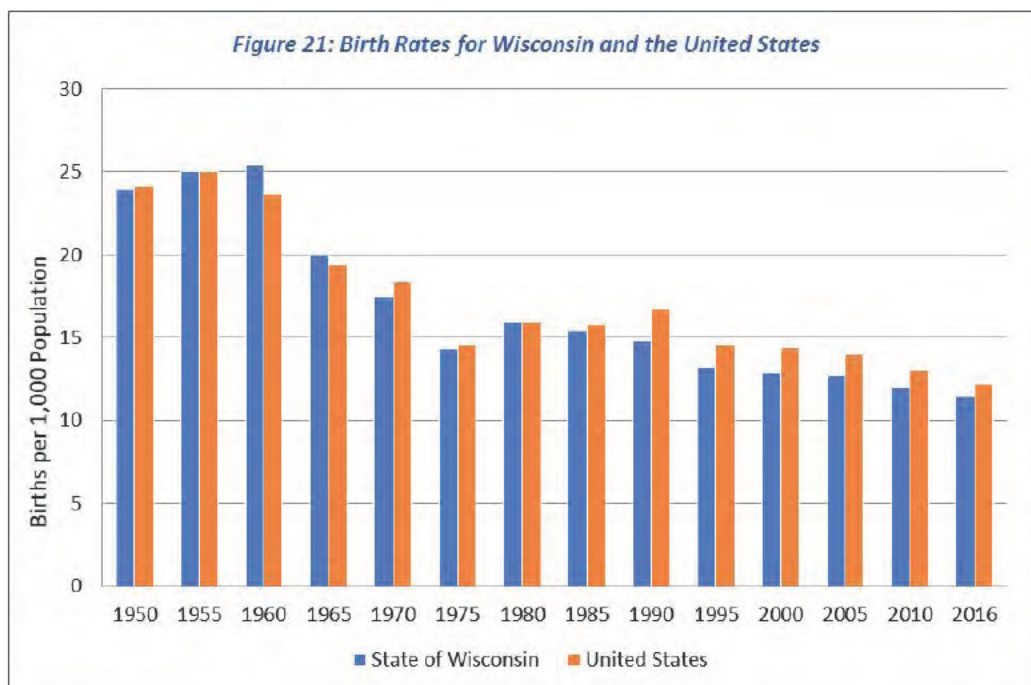
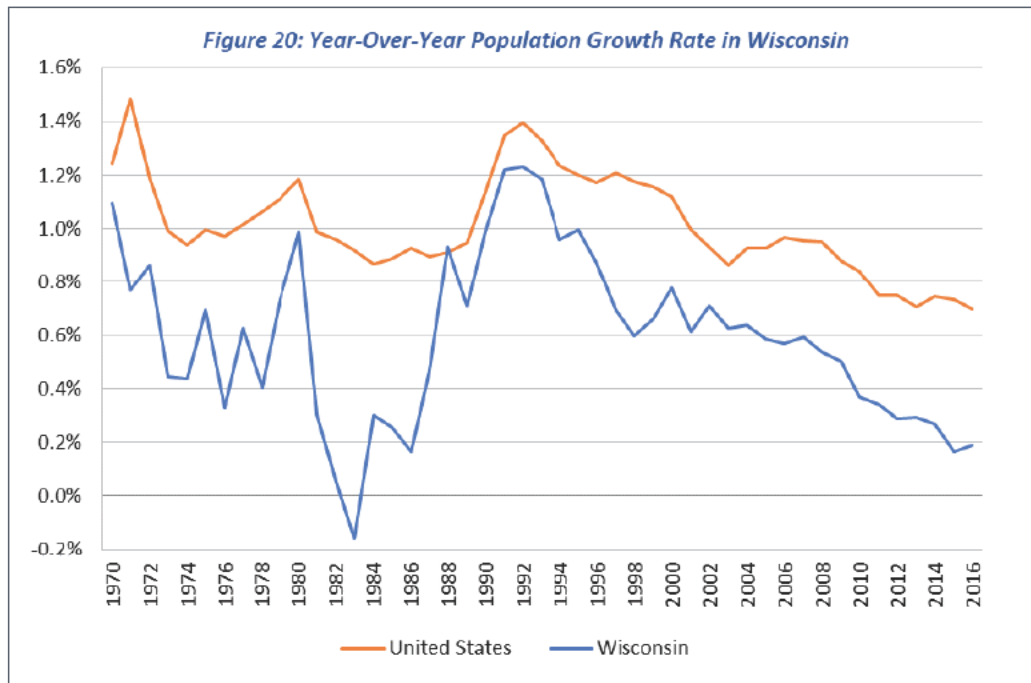
“Regions that are dominated by more mature firms are likely to see lower productivity growth than regions with a larger presence of younger firms.”



POPULATION DYNAMICS

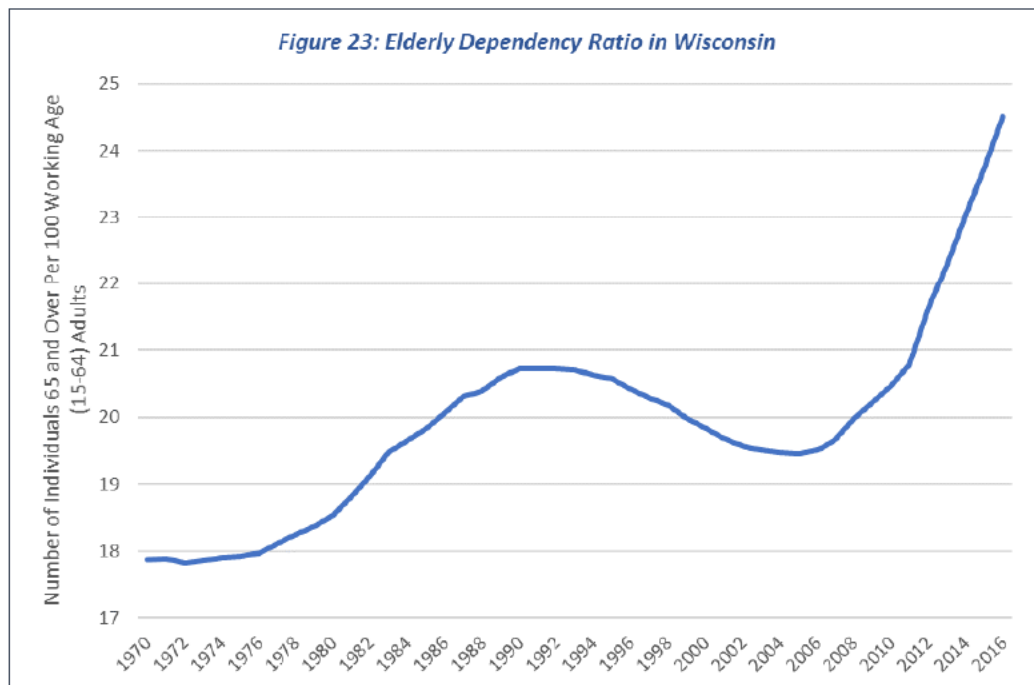
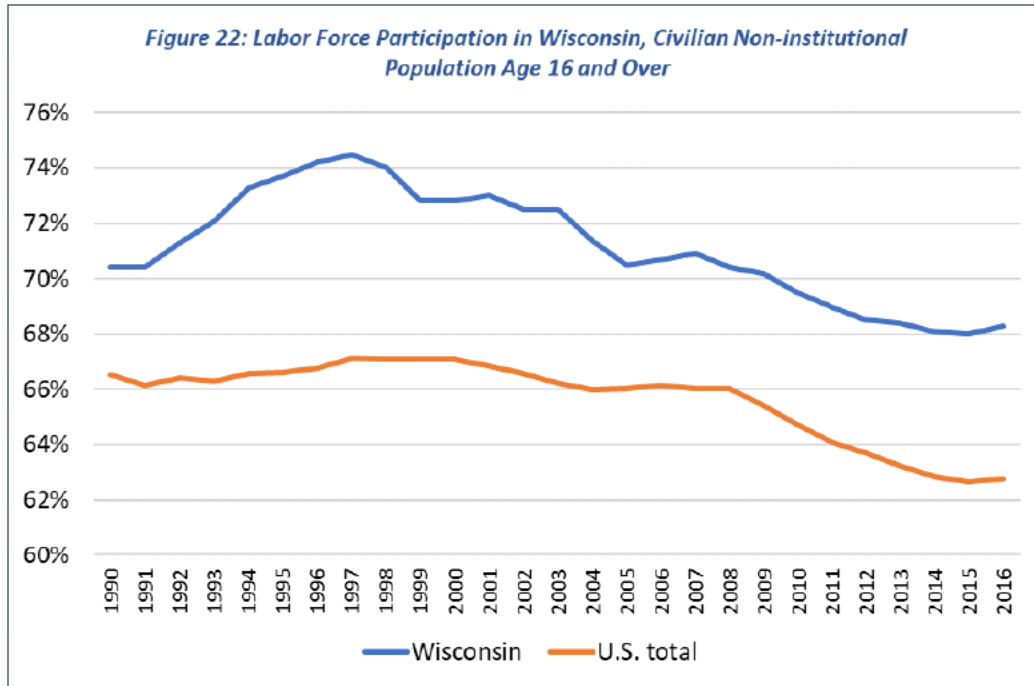
Population growth is an important factor in understanding the dynamism of the economy. At a minimum, a growing population stimulates demand with needs for various local services. Wisconsin's population is growing, though at a slower and slower rate (Figure 20). The slow population growth partly reflects a

declining birth rate: births have fallen to nearly half the rate between 1950 and 1960 when the many baby boomers were born (Figure 21). This slow population growth limits the demand for new businesses, which may partly explain the decline in startup activity discussed in the previous sections.



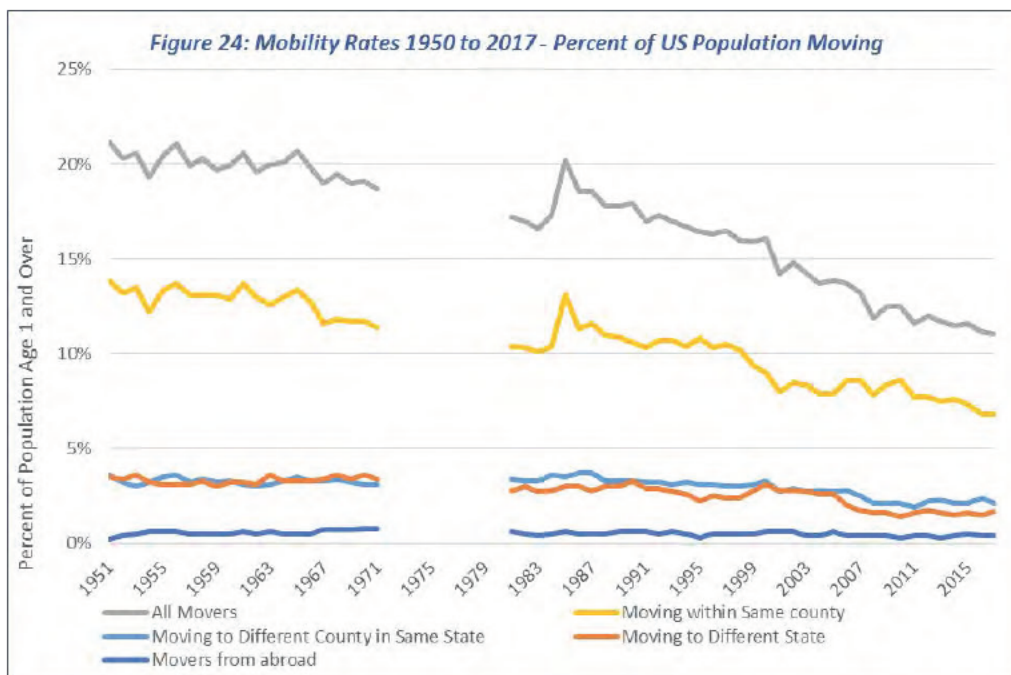
In addition to a slowing population growth rate, a decreasing share of the population is working (Figure 22). The large share of Baby Boomers reaching retirement age largely explain lower labor force participation rates in the state. Economists estimate approximately half of the decline in labor force participation can be explained by demographic shifts (Council of Economic Advisors). Indeed, the elderly dependency ratio (the number of

citizens over age 65 per 100 working age (15-64) adults) has been increasing dramatically (Figure 23). The Great Recession likely also played a role in this decrease, as discouraged workers, many of them near retirement, left the labor force and have not returned. Wisconsin is also largely rural and rural areas tend to have lower overall labor force participation rates (USDA, Rural America at a Glance).



Declining dynamism may also be a factor in the falling labor force participation rate (EIG). In addition to typical of-age retirements, people may choose to leave the labor force because of economic factors. Most relevant to the dynamism discussion, they may be unable to find a position well-suited to their skills at a wage they are willing to accept. A labor market with weak demand for workers and fewer and fewer new jobs is unlikely to keep workers on the

fringe engaged in employment or a job search. It is even less likely to pull in workers who never joined or have already exited the labor force. This pattern can even hold with record low unemployment rates as wages, benefits and working conditions may not be sufficient to entice people to reenter the labor force. In other words, an overabundance of low quality jobs will not be attractive to people that are not already in the labor force.



The lack of new, high quality, job prospects may also help explain the declining mobility observed in the nation as a whole. Mobility is important because periods of economic growth and decline do not happen uniformly across the country. Some places grow rapidly while others grow slowly or stall entirely. In order to get the most benefit from growth, workers need to be able to move freely from places with limited opportunities to those with the most. When people move into an area for employment opportunities or even life style choices (e.g., amenity-driven migration) they inject new knowledge and ideas into the local economy which in turn drives innovation and ultimately enhances the competitiveness of the region. Thus mobility has both productivity and innovation benefits that are important for local economies.

Often a move is motivated specifically by a job opportunity—a promotion, pay increase, or a chance for professional development. If fewer of these opportunities exist due to declining dynamism, we might also expect fewer people to move. Indeed, geographic mobility across the United States has been

declining since the 1990s: people simply are not migrating at the same historical rates (Figure 24). The lack of mobility in Wisconsin is clear in both the in and out-migration rates (Figures 25 and 26). While, it is true that working age, college-educated people do not leave Wisconsin at a very high rate, it is also the case that these skilled workers move here at an especially low rate. The latter, low in-migration, is the more pressing migration challenge for the state as people who come here generally stay. Getting them to come here in the first place is the limiting factor. With declining birth rates, future population growth will seemingly be linked even more strongly to migration patterns.

This lack of migration churn places downward pressure on the dynamism of not only the Wisconsin economy, but the nation overall. New people moving into Wisconsin bring with them new ideas and ways of conducting business. These new ideas are a fundamental source of innovation which drives a dynamic economy. As the flow of people declines, so does the flow of ideas and talent they bring with them.

“When people move into an area for employment opportunities or even life style choices, they inject new knowledge and ideas into the local economy which in turn drives innovation.”

Figure 25: Domestic Out-Migration Rate (2011-2015 5-Year Estimates) Per 1,000 Age 18 to 64 with a Bachelor's Degree or Higher

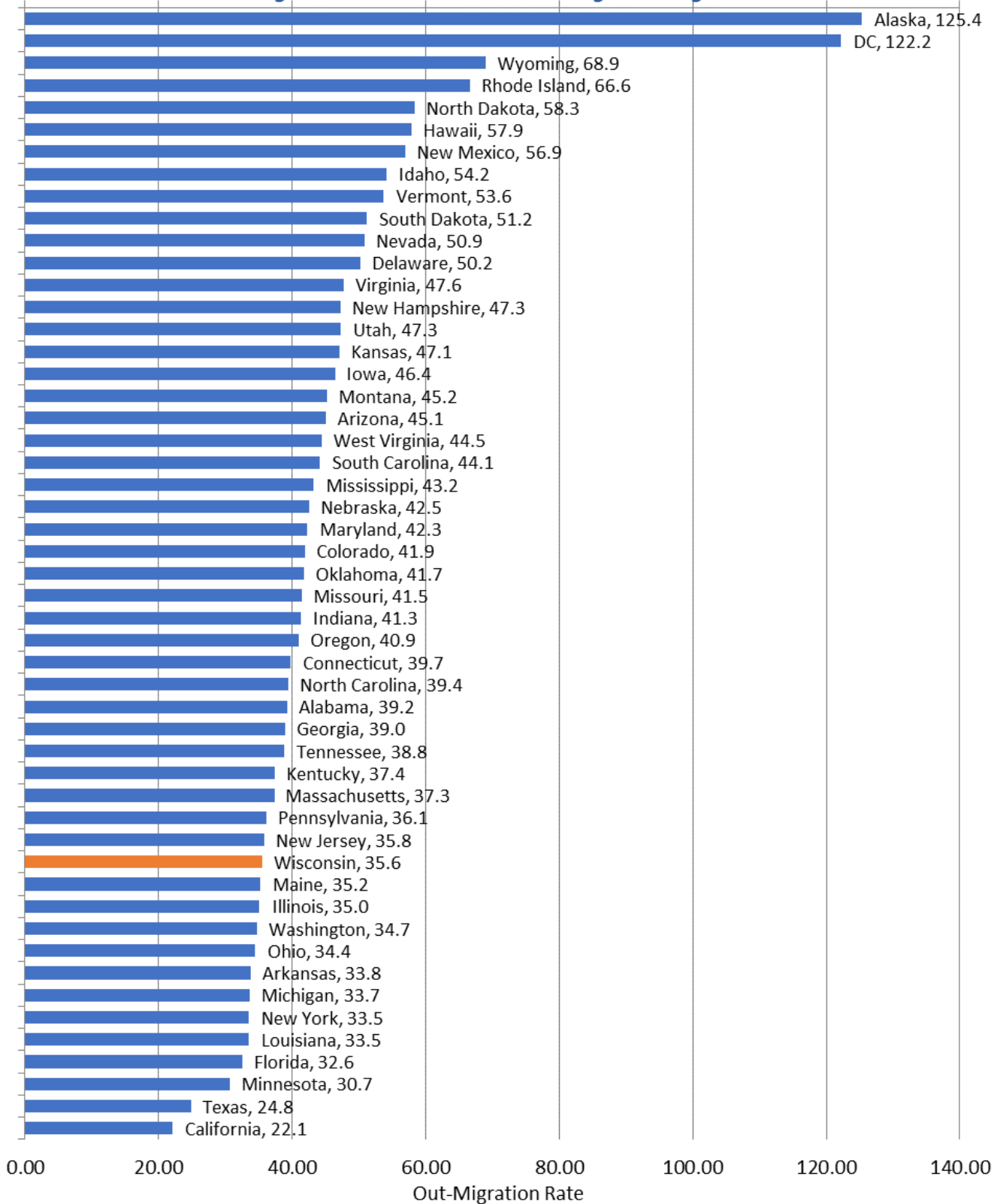
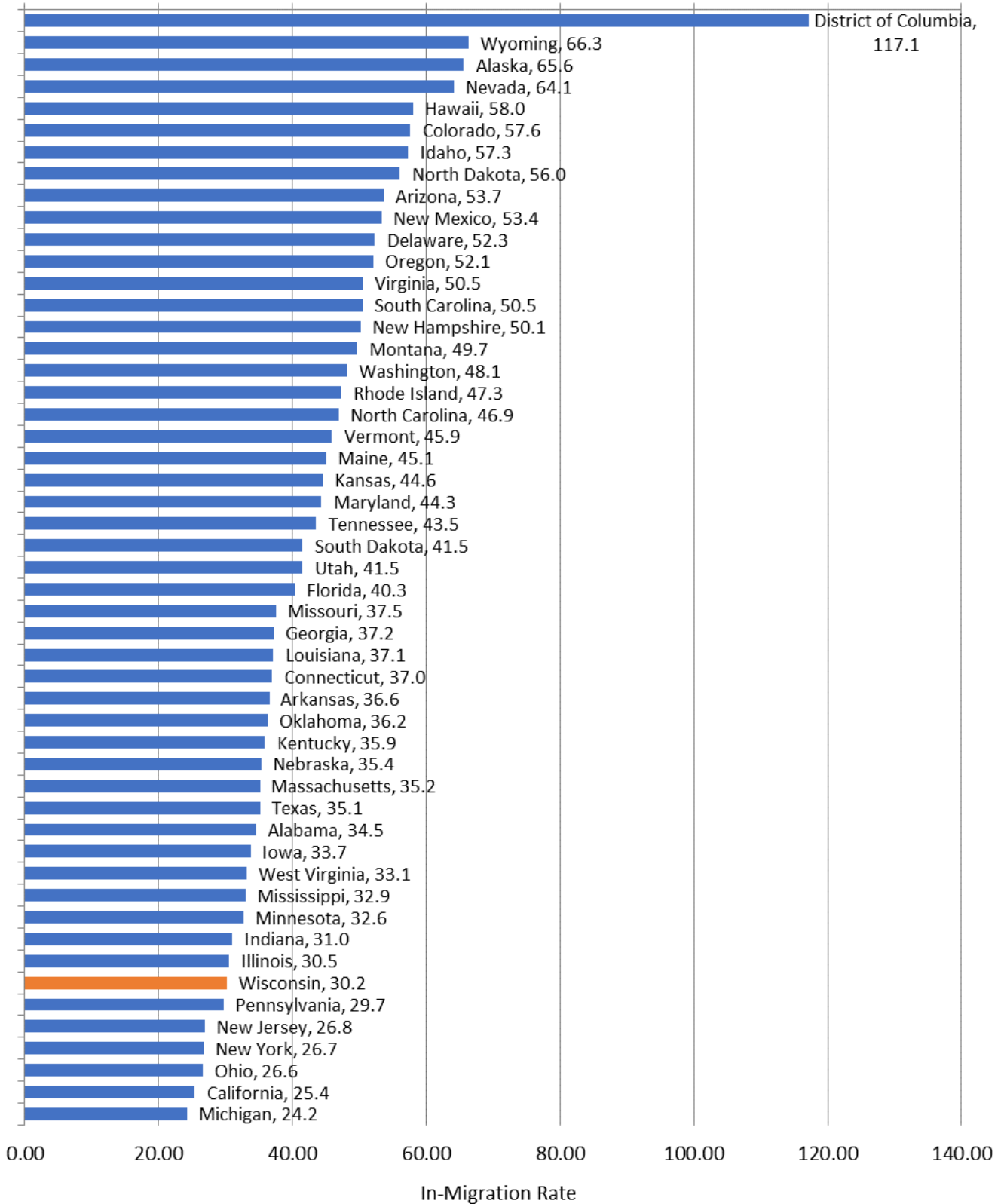


Figure 26: Domestic In-Migration Rate (2011-2015 5-Year Estimates) Per 1,000 Age 18 to 64 with a Bachelor's Degree or Higher

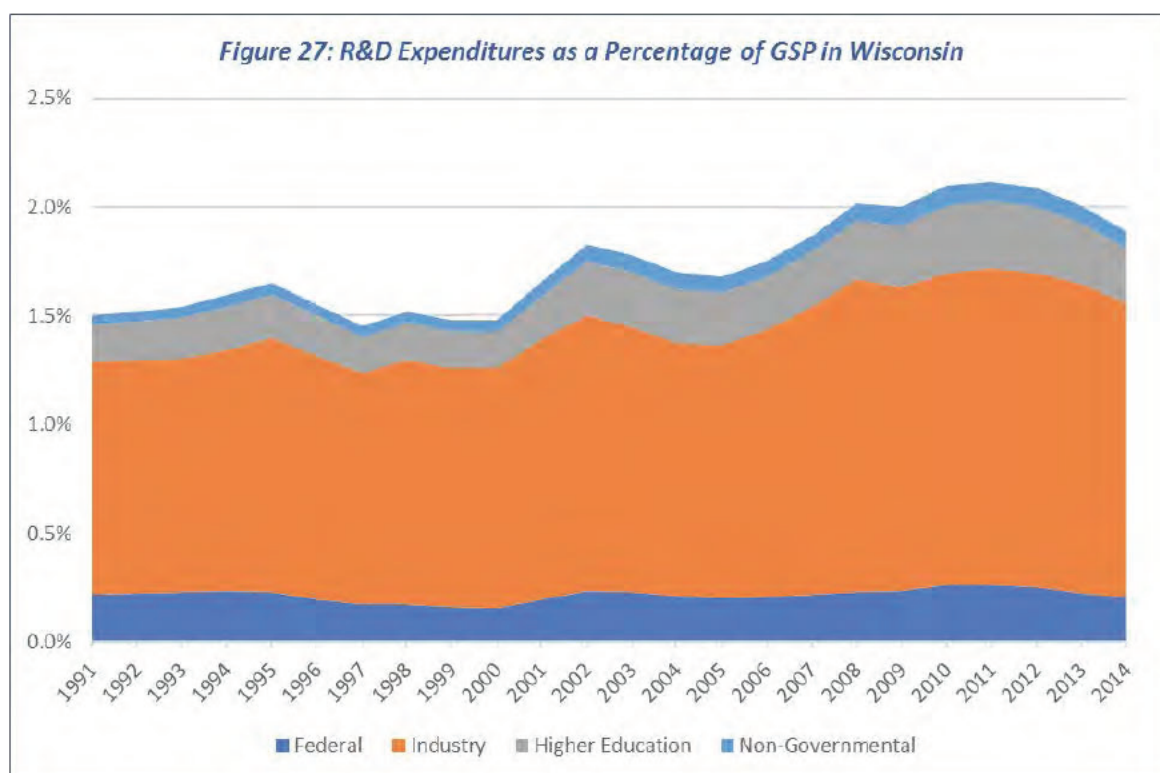


R & D DYNAMICS

As previously noted, innovation is one of the primary generators of economic growth and development. The advancements, new ideas, products, services, and applications that result from research and development (R&D) are a key component of dynamic, changing economy.[3] Therefore, no discussion of economic dynamism is complete without investigating changes in R&D over time. Unfortunately, innovation itself is difficult to quantify with the data available. Innovation is sometimes qualitative, non-linear, difficult to identify, or otherwise hard to measure. In this section, we focus on R&D as a key driver of new ideas and products. We view the dollar investment in research and development by businesses, the public

sector, and higher education as a signal of innovation and in turn a more dynamic economy.

Figure 27 shows R&D expenditures by institutional category, as a percentage of Wisconsin Gross State Product (GSP), between 1991 and 2014.[4] R&D spending as a share of GSP generally grew in the 1990s through 2010. With the onset of the Great Recession, spending began to decline. As of 2014, spending on R&D was noticeably lower than in peak years, indicating that a smaller share of Wisconsin's resources are going toward experimentation and innovation.



Despite the recent decline, the private sector (industry) is the clear leader of research and development in Wisconsin which is consistent with the rest of the country. Industry has also increased R&D spending since the early 1990s. Tasse (2010), however, highlights two additional trends. First, these increases are small compared to other competitor countries, such as China, and second, a growing share of this money is going toward applied research rather than highly innovative and risky basic research. This means firms are potentially becoming less likely to develop break-through technologies and entirely new platforms and instead focus on iterating a current product with smaller, incremental improvements.

Even though businesses fund and conduct the large majority of

research, they may still be underinvesting because research is risky. Businesses may be discouraged from spending on research that has an uncertain future value. Consequently, public benefits from technological advancement and quality improvements can go unrealized. Given the large potential public benefits from new products and services, quality improvements and technology advancements, the Federal government has long had an active role in R&D funding.

Often the Federal government funds R&D through grants to universities for basic research. This has allowed universities and colleges in Wisconsin, primarily UW-Madison, to be more active in R&D. Indeed, higher education in Wisconsin makes the second largest contribution to R&D, closely followed by the federal

[3] For a more detailed discussion of the role of R&D in the Wisconsin economy, see Deller and Conroy (2017)

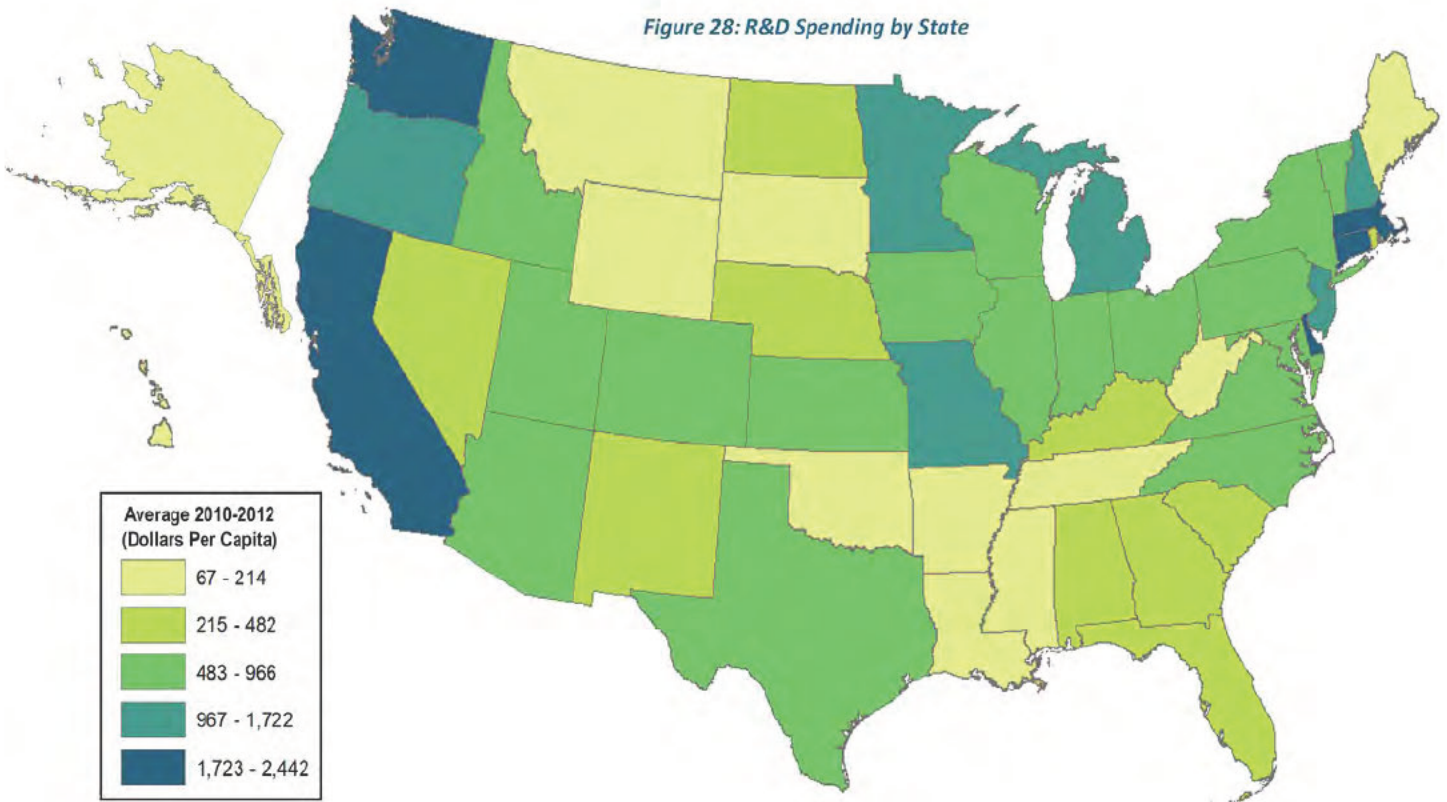
[4] Non-Federal R&D expenditures are a negligible percentage of GSP in Wisconsin so this category was removed from Figure 27.

“Higher rates of R&D investment in neighboring states increase their likelihood of forming [innovative] clusters which may be pulling startups out of Wisconsin and into these states.”

government. Some ideas developed at universities are spun off into startups, but much of the insight and new knowledge flowing from R&D likely remains in the public domain and freely available to all businesses and individuals. Thus, universities are an important component of R&D and innovation as partners of federal and private funders.

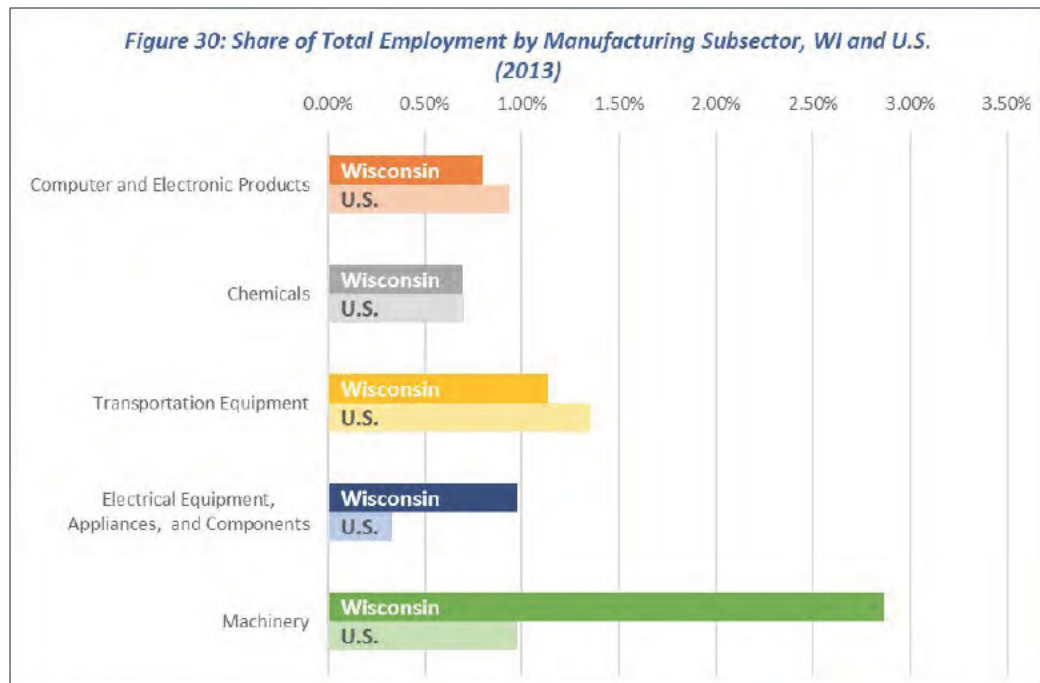
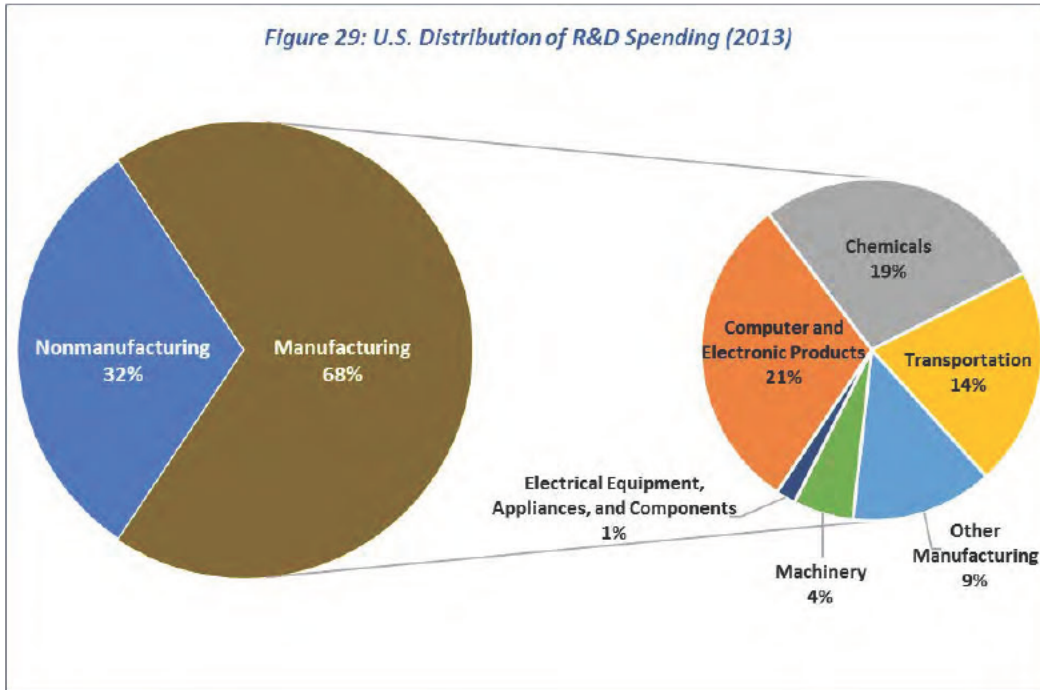
Wisconsin lags behind neighboring states such as Michigan and Minnesota in per capita R&D investment (Figure 28). This is potentially another contributing factor to the overall decline in

business dynamism in the state. It is possible that innovative clusters are one of the primary factors innovative firms are looking for when choosing where to open their facilities. These clusters are typically defined as areas with diverse and highly skilled labor pools, strong information networks, and robust investment in R&D. Innovative firms cluster in such places due to collective benefits offered by such assets. Higher rates of R&D investment in neighboring states may increase their likelihood of forming such clusters which could be pulling startups out of Wisconsin and into these states.



Another reason Wisconsin may be struggling to maintain levels of R&D is the industrial composition within the state relative to national trends in R&D investment. Manufacturing conducts the large majority, more than two-thirds, of R&D nationally (Figure 29). Manufacturing R&D is concentrated in certain subsectors namely computer and electronic products, chemicals, and transportation equipment. Wisconsin's manufacturing, unfortunately, tends to be dominated by sectors, in terms of employment, that tend to invest relatively modestly in R&D (Figure 30).

This means that the most active R&D sectors are average or underrepresented in Wisconsin. Conversely, the sectors that do comparatively little R&D, electrical equipment, appliances and components and machinery, are overrepresented in Wisconsin. With a relatively small presence of research-intensive industries in Wisconsin, the innovative capacity for the state is limited to more traditional industries which contribute to a less dynamic economy.



LENDING DYNAMICS

A dynamic economy requires a flow of financial resources (e.g., credit) to allow businesses to make investments and expand. As noted above, startup activity tends to drive a dynamic economy and prior work (Conroy et al. 2017) suggests that startup activity, particularly in rural areas, is sensitive to changes in small business lending. Thus, we focus our discussion here on the pattern of small business lending.

Figure 31 presents trends in small business lending in Wisconsin over the last two decades. There is a clear increase in lending until the beginning of the Great Recession, followed by a steep decline between 2007 and 2010 with little recovery since. Compared to the years preceding the recession, banks are making fewer loans and lending a smaller amount in total. With much less institutional finance, businesses are operating under the conditions of a new normal. Given this low and stable lending trend, perhaps it is not surprising that Wisconsin has no more employer businesses than it did in 2000.

Some care must be taken in relating the decline in business startup activity and small business lending patterns. Though some evidence does suggest that changes in lending precede changes in startup activity (Conroy et al. 2017), this analysis cannot conclude that declining small business loans is causing the decline in startups. We can conclude, however, that the combined effects of less small business lending activity and startup rates is leading to a less dynamic Wisconsin economy.

Compared to the rest of the nation, Wisconsin's share of lending activity has also declined, both in volume and number of loans (Figure 32). This implies that the negative impacts of tightened credit markets have been more severe in Wisconsin than the rest of the country. To the extent that entrepreneurs are footloose and are attracted to available capital, Wisconsin may be becoming less competitive for new businesses relative to other states due to changes in institutional finance.

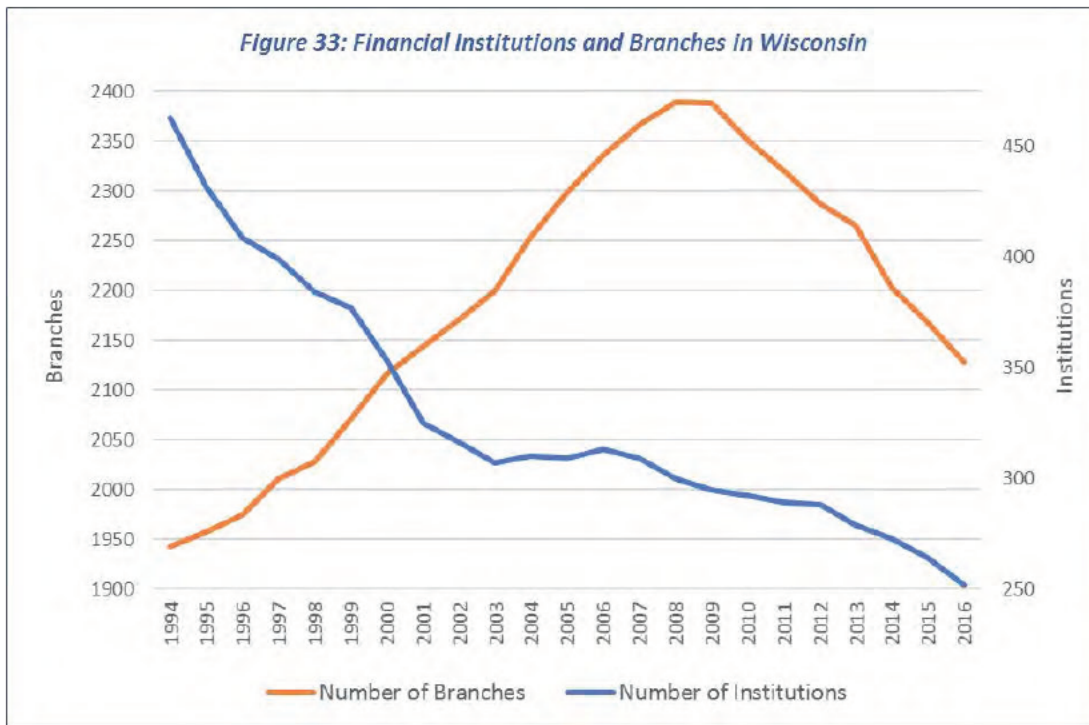


Given the declines in lending, this most recent recession, which was paired with a financial crisis, had particularly dire consequences for entrepreneurs by stifling an important source of capital. Decreasing home values compounded the problem by making it harder to get home equity loans which small businesses owners can use as an alternative source of capital. With limited access to institutional finance, entrepreneurs undoubtedly faced unusually adverse conditions during and after the recession that curbed startup activity. Now, years from the recession, entrepreneurial activity and lending are both lower than the years leading up to the recession, suggesting a new equilibrium with fewer businesses and more severe capital constraints.

These changes in lending have come alongside broader sectoral shifts in the banking sector. Over the last two decades, the total number of banking institutions has consistently declined (Figure 33). In addition to large commercial institutions, the number of banking institutions includes smaller community banks, credit unions and similar lending institutions. The total number of these various types of institutions has decreased steadily since the early 1990's and show no signs of changing course.

The number of institutions is distinct from the number of branches or locations these banks operate, which are spread across the state. Wells Fargo, for example, is just one institution but it operates many branches in the state. The declining number of unique banking institution is due, in large part, to continued consolidation of the financial sector. Many small and independent community or regional banks closed while branches of larger commercial banking institutions expanded. The result was that, prior to the Great Recession, the number of unique institutions decreased while the total number commercial bank branch offices went up by roughly a quarter (Figure 33). This trend, though, changed in 2009 in the midst of the recession.

From 2009 to 2016, a new trend emerged. Following the financial crisis both the number of institutions and branches declined. This suggests that consolidation continued but branch locations were also closing. These conditions in the financial sector limit both the access to capital and selection of vendors for entrepreneurs throughout the state.

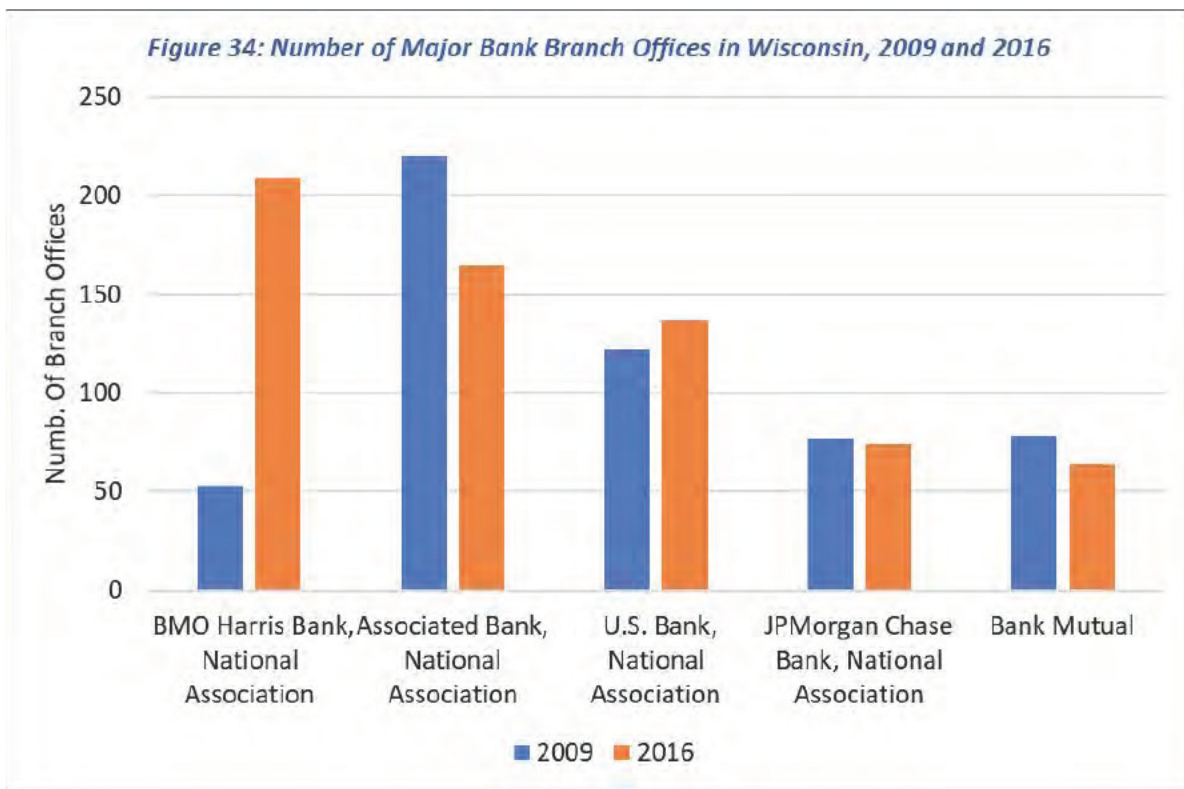


“The number and volume of small business loan activity in Wisconsin has yet to return to its pre-Great Recession levels.”

“[Consolidation] in the financial sector limits both the access to capital and selection of vendors for entrepreneurs throughout the state.”

Figure 34 shows the number of major bank branch offices in Wisconsin in 2009, compared to those in 2016. These five banks account for more than a third of all branch offices in the state in 2016, whereas just five years prior, they accounted for a little more than a quarter. This is yet one more indication of consolidation in the banking industry. While this may lead to more efficient delivery of services, it is also likely partly responsible for the downward trend in small business lending, especially in rural parts of the state where borrowers have traditionally relied on personal relationships with community banks to qualify for loans.

Care must be taken, however, to draw a causal linkage where tightening small business credit is the cause of lower rates of small business dynamics in Wisconsin or throughout the U.S. One may be tempted to conclude that bankers are restricting financing to new and small businesses in Wisconsin thus placing a constraint on Wisconsin entrepreneurialism. Alternatively, the demand for business loans, particularly small business loans, could be low and banks are responding to changing market conditions. In reality, it is likely that both supply and demand for loans are changing and the research required to disentangle these relationships is beyond the scope of the descriptive analysis provided in this study.



“While [bank consolidation] may lead to more efficient delivery of services, it is also likely partly responsible for the downward trend in small business lending, especially in rural parts of the state where borrowers have traditionally relied on personal relationships with community banks to qualify for loans.”

Conclusion

The decline in economic dynamism over the last few decades, and particularly since the recession, is striking.

There is less churn across the economy—fewer employer businesses are being created, leading to thinner labor markets. Population growth is slowing and fewer people are moving across state lines. Investment in research and development as well as small business startup and growth has declined as well. This widespread slow-down means the economy is less agile—in a less competitive position to experiment, change, and adapt to an always-changing economic landscape.

The most critical component of the decline in dynamism is the loss of new business activity. The birth rate of new establishments has been falling for decades only to have accelerated during the recession. The lack of new businesses is just one sign of a less active business sector. Alongside the birth rate, the establishment death rate is falling too. On its own, fewer closures may seem positive because it can mean more businesses and jobs. However, together a slow birth and death rate signal less experimentation and fewer new ideas in the market.

Entrepreneurship is nearly inseparable from job creation. The quantity of new businesses each year is necessarily tied to the number of jobs created—or not. Comparatively, mature firms are reliable sources of existing employment but do little to add additional jobs to the economy. These existing firms, even bolstered by policies that may enhance their survivability or growth trajectory, are unlikely to offset the scale and impact of the losses from a lack of new firms. For workers, the decline in dynamism means that they're losing an important mechanism that leads to opportunities for advancement and wage growth. Workers across the country are drawn to thick labor markets for their job prospects as well as their amenities. With fewer new businesses creating jobs, there are fewer opportunities for career advancement by moving for a new job or by using an outside offer to bargain with a current employer.

Thinner labor markets may partly explain both decades of declining mobility and slow wage growth. The labor market conditions for workers are also stalling already slow population change in Wisconsin. Population is one factor driving new business formation but population growth in Wisconsin has slowed and the residents we do have are

aging. With little in-migration, the potential to offset our slow population growth with people from out of state is limited, especially if there are few attractive new jobs to incentivize their relocation.

As further evidence of the decline, investments in new ideas have also slowed. While it's true that the amount of money spent on research and development has increased, it has increased slower than the rest of the economy. That is, a smaller share of the Wisconsin economy is actively being put toward innovation. Part of this may be due to limits on federal support but, it is also the case that Wisconsin is low on industries that are more active in research and development. Since the last recession which was coupled with a financial crisis, banks have tightened their lending practices, reducing an important source of capital for entrepreneurs. These lending practices have also come along with consolidation of the banking sector which is likely to disproportionately affect rural areas who rely on their relationships with community bankers for access to lending. These factors together are creating a difficult financing environment for small business to start and expand.

Altogether, the lack of business dynamism, opportunity, and investment activity suggest a concerning picture of Wisconsin. The rest of the country is facing similar challenges, but Wisconsin is already seeing more severe changes than most states. In the midst of long economic expansion, these trends may be exposing fault lines—indicating where there might be challenges for the future.

These trends may also be equally useful for informing economic development ahead of potentially more damaging consequences.



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Appendix A

County Rankings by Average Startup Rate and Average Death Rate

County Name	Avg. Startup Rate	Avg. Death Rate	Avg. Annual Startups	Avg. Annual Deaths
Menominee County	12.5%	7.8%	3	2
Rusk County	8.8%	8.0%	28	25
St. Croix County	8.2%	7.7%	172	162
Pierce County	8.1%	7.8%	63	61
Chippewa County	8.0%	7.3%	124	112
Florence County	7.9%	10.5%	8	11
Vilas County	7.9%	9.2%	74	86
Vernon County	7.9%	8.3%	49	51
Eau Claire County	7.9%	7.5%	212	201
Milwaukee County	7.9%	8.4%	1538	1651
Kenosha County	7.9%	8.2%	238	248
Dane County	7.8%	7.4%	1038	987
Adams County	7.7%	8.3%	25	27
Bayfield County	7.7%	7.6%	33	33
Jackson County	7.6%	7.3%	32	31
Dunn County	7.6%	7.8%	68	70
Monroe County	7.6%	7.1%	72	68
Buffalo County	7.4%	8.0%	24	26
Clark County	7.4%	7.3%	54	54
Forest County	7.4%	7.6%	18	19
Racine County	7.3%	7.8%	294	313
Polk County	7.3%	7.3%	81	81
Iron County	7.3%	8.4%	16	18
Iowa County	7.3%	7.3%	40	40
Portage County	7.3%	6.9%	117	111
Washburn County	7.2%	7.8%	37	40
Walworth County	7.2%	7.9%	189	208
Sawyer County	7.2%	8.8%	48	58
Waukesha County	7.1%	7.8%	884	974
Columbia County	7.1%	7.7%	99	107
Oneida County	7.1%	7.9%	94	105
Trempealeau County	7.1%	7.0%	47	46
Oconto County	7.1%	7.8%	54	59
Pepin County	7.0%	6.1%	16	14
Taylor County	7.0%	6.2%	33	30
Outagamie County	7.0%	7.3%	345	359

Appendix A cont.

County Name	Avg. Startup Rate	Avg. Death Rate	Avg. Annual Startups	Avg. Annual Deaths
Rock County	7.0%	7.8%	226	252
Ozaukee County	7.0%	7.3%	190	200
Crawford County	6.9%	8.0%	29	33
La Crosse County	6.9%	6.6%	205	196
Burnett County	6.9%	8.5%	28	35
Washington County	6.9%	7.2%	217	227
Brown County	6.9%	7.1%	435	446
Shawano County	6.9%	7.9%	61	71
Jefferson County	6.8%	7.5%	131	144
Sauk County	6.8%	7.2%	120	128
Barron County	6.8%	7.0%	87	90
Marquette County	6.7%	8.2%	20	24
Green Lake County	6.7%	7.7%	33	38
Kewaunee County	6.7%	8.2%	31	38
Juneau County	6.7%	8.1%	37	45
Waushara County	6.7%	7.9%	32	37
Marathon County	6.7%	7.5%	222	249
Douglas County	6.5%	7.2%	68	75
Calumet County	6.5%	6.7%	57	59
Richland County	6.5%	7.1%	24	26
Door County	6.5%	7.0%	84	91
Waupaca County	6.5%	7.5%	79	92
Price County	6.5%	8.1%	28	35
Marinette County	6.5%	7.2%	71	80
Lafayette County	6.4%	6.7%	23	24
Grant County	6.3%	6.5%	77	79
Winnebago County	6.3%	7.0%	221	248
Green County	6.2%	6.1%	58	57
Sheboygan County	6.1%	6.6%	164	177
Ashland County	6.1%	8.0%	32	42
Lincoln County	6.0%	6.9%	41	47
Manitowoc County	5.9%	6.5%	106	116
Fond du Lac County	5.9%	6.9%	141	164
Wood County	5.8%	6.7%	104	120
Dodge County	5.8%	6.9%	102	121
Langlade County	4.8%	6.2%	27	35
Wisconsin	7.2%	7.6%	9,898	10,444

Appendix B

Counties by Name

County Name	Avg. Startup Rate	Avg. Death Rate	Avg. Annual Startups	Avg. Annual Deaths
Adams County	7.7%	8.3%	25	27
Ashland County	6.1%	8.0%	32	42
Barron County	6.8%	7.0%	87	90
Bayfield County	7.7%	7.6%	33	33
Brown County	6.9%	7.1%	435	446
Buffalo County	7.4%	8.0%	24	26
Burnett County	6.9%	8.5%	28	35
Calumet County	6.5%	6.7%	57	59
Chippewa County	8.0%	7.3%	124	112
Clark County	7.4%	7.3%	54	54
Columbia County	7.1%	7.7%	99	107
Crawford County	6.9%	8.0%	29	33
Dane County	7.8%	7.4%	1038	987
Dodge County	5.8%	6.9%	102	121
Door County	6.5%	7.0%	84	91
Douglas County	6.5%	7.2%	68	75
Dunn County	7.6%	7.8%	68	70
Eau Claire County	7.9%	7.5%	212	201
Florence County	7.9%	10.5%	8	11
Fond du Lac County	5.9%	6.9%	141	164
Forest County	7.4%	7.6%	18	19
Grant County	6.3%	6.5%	77	79
Green County	6.2%	6.1%	58	57
Green Lake County	6.7%	7.7%	33	38
Iowa County	7.3%	7.3%	40	40
Iron County	7.3%	8.4%	16	18
Jackson County	7.6%	7.3%	32	31
Jefferson County	6.8%	7.5%	131	144
Juneau County	6.7%	8.1%	37	45
Kenosha County	7.9%	8.2%	238	248
Kewaunee County	6.7%	8.2%	31	38
La Crosse County	6.9%	6.6%	205	196
Lafayette County	6.4%	6.7%	23	24
Langlade County	4.8%	6.2%	27	35
Lincoln County	6.0%	6.9%	41	47
Manitowoc County	5.9%	6.5%	106	116

Appendix B cont.

County Name	Avg. Startup Rate	Avg. Death Rate	Avg. Annual Startups	Avg. Annual Deaths
Marathon County	6.7%	7.5%	222	249
Marinette County	6.5%	7.2%	71	80
Marquette County	6.7%	8.2%	20	24
Menominee County	12.5%	7.8%	3	2
Milwaukee County	7.9%	8.4%	1538	1651
Monroe County	7.6%	7.1%	72	68
Oconto County	7.1%	7.8%	54	59
Oneida County	7.1%	7.9%	94	105
Outagamie County	7.0%	7.3%	345	359
Ozaukee County	7.0%	7.3%	190	200
Pepin County	7.0%	6.1%	16	14
Pierce County	8.1%	7.8%	63	61
Polk County	7.3%	7.3%	81	81
Portage County	7.3%	6.9%	117	111
Price County	6.5%	8.1%	28	35
Racine County	7.3%	7.8%	294	313
Richland County	6.5%	7.1%	24	26
Rock County	7.0%	7.8%	226	252
Rusk County	8.8%	8.0%	28	25
Sauk County	6.8%	7.2%	120	128
Sawyer County	7.2%	8.8%	48	58
Shawano County	6.9%	7.9%	61	71
Sheboygan County	6.1%	6.6%	164	177
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Taylor County	7.0%	6.2%	33	30
Trempealeau County	7.1%	7.0%	47	46
Vernon County	7.9%	8.3%	49	51
Vilas County	7.9%	9.2%	74	86
Walworth County	7.2%	7.9%	189	208
Washburn County	7.2%	7.8%	37	40
Washington County	6.9%	7.2%	217	227
Waukesha County	7.1%	7.8%	884	974
Waupaca County	6.5%	7.5%	79	92
Waushara County	6.7%	7.9%	32	37
Winnebago County	6.3%	7.0%	221	248
Wood County	5.8%	6.7%	104	120
Wisconsin	7.2%	7.6%	9,898	10,444

Figure 1

This figure is generated from the Census BDS Establishment Characteristics Data Tables. This figure describes the total number of establishments of all ages in the Wisconsin from 1977 to 2014.

Figure 2 & Figure 3

These figures are calculated from the Census BDS Establishment Characteristics Data Tables. The startup rate is the ratio of sum of all entry by Age 0 establishments to all establishments in Wisconsin. The share of employment in new companies is the ratio of employment of new establishments less than one year old to the total employment in Wisconsin.

Figure 4

This figure is generated from the Census BDS Establishment Characteristics Data Tables. It is the total Age 0 establishment entry in Wisconsin.

Figure 5

This figure is generated from the CBP and NES. The growth in nonemployer and employer establishments are each calculated as the ratio of the change in establishments from base year to the level in base year.

Figure 6

The right figure is calculated from the CBP and NES. The shares of employer and nonemployer businesses are equal the ratio of their respective number of establishments to the total, which is equal to the sum of employer and nonemployer establishments from the CBP and NES.

Figure 7

This figure is calculated from the Census BDS Establishment Characteristics Data Tables. The startup rate is the ratio of number of sum of all entry by Age 0 establishments to total number of establishments of all ages. Similarly, the death rate is the ratio of number of number of establishments at all ages exiting from the last 12 months to all establishments of all ages.

Figure 8

This figure is calculated from the Census BDS Establishment Characteristics Data Tables. The annual difference between establishment births and deaths is the sum of all entry by Age 0 establishments minus the number of establishments of all ages exiting from the last 12 months.

Note: The number of establishments that exited in 1987 is extremely low, explaining why the difference between establishment births and deaths in 1987 is so high.

Figures 9 & 10

These figures are calculated from the Census BDS Establishment Characteristics Data Tables. The total increase in the number of establishments is the difference between total establishments in the final year of the time period given and total establishments at the beginning.

Figures 11 & 12

This figure is calculated from the County Business Patterns and Statistics of U.S. Businesses. The startup rate is the ratio of number of sum of Age 0 establishments (from SUSB) to total number of establishments of all ages in the Wisconsin (from CBP) by sectors.

Figure 13

This figure is calculated from the County Business Patterns and Statistics of U.S. Businesses. The startup rate is the ratio of the sum of Age 0 establishments (from SUSB) to the total number of establishments of all ages in Wisconsin (from CBP) by sectors. Similarly, the death rate is the ratio of number of exiting establishments of all ages (from SUSB) to all establishments of all ages in Wisconsin (from CBP).

Tables 1 & 2

This figure is calculated from the County Business Patterns and Statistics of U.S. Businesses. The startup rate is the ratio of the sum of Age 0 establishments (from SUSB) to the total number of establishments of all ages in Wisconsin counties (from CBP). Similarly, the death rate is the ratio of the number of establishments of all ages exiting in the last 12 months to all establishments of all ages.

Figure 14

This figure is calculated from the Census BDS Establishment Characteristics Data Tables. The gross job creation rate is the ratio of gross job creation in businesses with fewer than 500 employees to total employment in businesses with fewer 500 employees. The job destruction rate and net job creation rate are computed similarly.

Figures 15

This figure is calculated from the Census BDS Establishment Characteristics Data Tables. This describes the average net job creation in each establishment age category from 1994 to 2014.

Figure 16

This figure is calculated from the Census BDS Establishment Characteristics Data Tables. This describes the net job creation in each establishment age categories for each year.

Figures 17 & 18

This figure is calculated from the Census BDS Establishment Characteristics Data Tables. The share of establishments is the ratio of number of establishments age 16 and over to total establishments of all ages. Also, the share of jobs is the ratio of employment in the establishments 16 years and older to the total employment in all establishments.

Figure 19

This figure is generated using hire and separation data from U.S. Census Bureau's Job-to-Job Flow Counts for the state of Wisconsin and annual wage & salary employment from the Bureau of Economic Analysis. The job turnover rate is defined as the sum of hires in a given quarter and separations in the next quarter divided by the average annual wage & salary employment.

Figure 20

This figure is generated from the Bureau of Economic Analysis. The growth rate is the ratio of population change between successive years to the level in the first year.

Figure 21

Authors' analysis of data from Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services and National Vital Statistics Reports.

Figure 22

This figure is calculated from the Local Area Unemployment Statistics (LAUS) program of the Bureau of Labor Statistics (BLS). The labor force is the sum of employed and unemployed persons, and the labor force participation rate is the labor force as a percent of the civilian noninstitutional population.

Figure 23

This figure is generated from the US Census Bureau data. Elderly dependency ratio is the number of individuals 65 and over per 100 working age (15-64) adults.

Figure 24

This figure shows annual mobility rates from the U.S. Census Bureau Current Population Survey.

Figures 25 & 26

These figures show domestic out and in-migration rates by state for the 50 states and the District of Columbia. The migration rate is defined as the number of citizens with a bachelor's degree or higher moving across state lines per 1,000 residents with a bachelor's degree or higher. The figures only include those individuals ages 18 to 64. These are 5 year estimates from the Census Bureau's American Community Survey extracted from IPUMS-USA: Steven Ruggles, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. Integrated Public Use Microdata Series: Version 7.0 [dataset]. Minneapolis: University of Minnesota, 2017. <https://doi.org/10.18128/D010.V7.0>.

Figure 27

This figure is calculated from the National Science Foundation. The Wisconsin R&D as a Percentage of state GSP is the ratio of R&D performed per dollar of WI gross state product by source of funding.

Figure 28

This figure shows average R&D spending by state, 2010-2012, from the National Science Foundation.

Figure 29

This figure shows the distribution of R&D spending in the U.S. and by subsector within the manufacturing based on 2013 data from the National Science Foundation available here: <https://www.nsf.gov/statistics/2018/nsb20181/assets/1038/tables/at04-13.pdf>.

Figure 30

The employment shares are calculated for 2013 from the Quarterly Census of Employment and Wage available from the Bureau of Labor Statistics.

Figure 31

This figure is calculated from the Community Reinvestment Act Data and BEA population data. The number of business loans per 1000 population is equal to the number of small business loans originated with loan amount at origination of less than \$100,000 divided by population (in thousands), and the lending value per 1000 population is the total loan amount of small business loans originated with loan amount at origination of less than \$100,000 divided by population (in thousands).

Figure 32

This figure is calculated from the Community Reinvestment Act Data available through the Small Business Administration. The share of US small business lending is the ratio of number of small business loans under \$100,000 (or the value of small business loans under \$100,000) in Wisconsin to the US total number of small business loans under \$100,000 (or the value of small business loans under \$100,000 in US).

Figure 33

This figure is generated from the Federal Deposit Insurance Corporation (FDIC) branch office data (available here: <https://www.fdic.gov/bank/statistical/guide/data.html>).

Figure 34

This figure is generated from the Federal Deposit Insurance Corporation (FDIC) branch office data (available here: <https://www.fdic.gov/bank/statistical/guide/data.html>). The major banks are the top 5 banks with the most branch offices in 2016.