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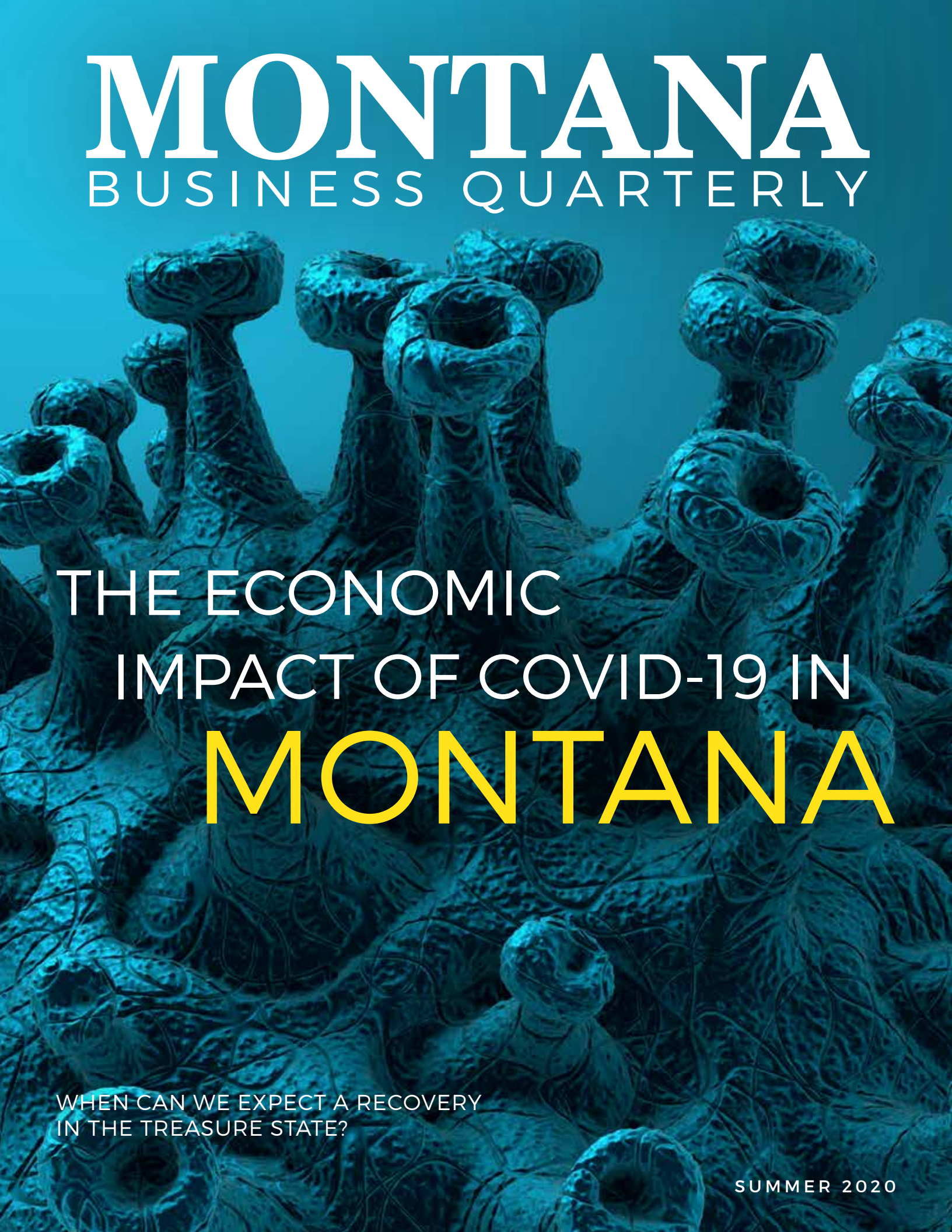

THE ECONOMIC IMPACT OF COVID-19 IN MONTANA

WHEN CAN WE EXPECT A RECOVERY IN THE TREASURE STATE?

SUMMER 2020

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The Bureau of Business and Economic Research has been providing information about Montana's state and local economies for more than 70 years. Housed on the Missoula campus of the University of Montana, the bureau is the research and public service branch of the College of Business. On an ongoing basis the bureau analyzes local, state and national economies; provides annual income, employment and population forecasts; conducts extensive research on forest products, manufacturing, health care and child well-being; designs and conducts comprehensive survey research at its on-site call center; presents annual economic outlook seminars in cities throughout Montana; and publishes the award-winning Montana Business Quarterly.

COVER
Microscopic view of an infectious virus. (Shutterstock)

INSIDE COVER
Protesters gather outside the Montana State Capitol in Helena, Montana, criticizing Gov. Steve Bullock's response to the COVID-19 pandemic. (AP Photo, Thom Bridge)

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MESSAGE FROM THE VICE PRESIDENT FOR RESEARCH AND CREATIVE SCHOLARSHIP

The University of Montana, along with the state and country, have felt the impact of the COVID-19 pandemic. When I surveyed the campus for projects our faculty, students and staff were doing to support the Missoula community, I received 56 examples of the university working to support the region.

A few examples include: Accelerate Montana established the Business Emergency Assistance & Recovery Initiative to provide timely advice and refer businesses to relevant programs and resources provided by federal and state agencies in response to COVID-19. Several units, including the Innovation Factory, spectrUM, PawPrint and Bitterroot College FabLab, used their 3D printers to print face shields and masks, which were distributed locally.

UM received two large federal grants to lead research efforts aimed at lessening the severity of the pandemic. The Center for Translational Medicine received a $2.5 million grant from the National Institutes of Health to develop vaccine adjuvants for COVID-19. UM also received a five-year $10.75 million grant from the National Institutes of Health to establish the Center for Population Health Research. The center will conduct epidemiological modeling related to disease prevention strategies in rural communities.

I hope you enjoy this issue of the Montana Business Quarterly, as we update you on the economic impact of the coronavirus in Montana. Stay safe and be well!

Scott L. Whittenburg
Vice President for Research and Creative Scholarship
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MISSOULA HOUSING PRICES SOAR

Home Prices See Largest Jump in a Decade

BY BRANDON BRIDGE

Home prices in Missoula have been rising steadily since 2012, with very little sign of slowing. The median sale price of a Missoula home in 2019 was around $315,000. The first few months of data for 2020 shows the median sale price rising to over $340,000, making it harder for residents to find affordable living situations. While home prices have been growing across the board in Missoula County, they have been rising fastest among entry-level homes. This has made affordability particularly challenging for new prospective homeowners, which has resulted in the past eight years being categorized as a seller's market for entry-level homes.

While there are many factors that can influence a local housing market, there are a few ingredients that make a particularly good recipe for a seller's market. Some of these ingredients are demand-side factors, such as rising employment and income levels, regional population growth resulting from positive net-migration, easing credit requirements, and other government incentive programs that serve to increase competition among would-be buyers. Other ingredients for a seller's market are supply-side factors, such as low inventories and barriers to new construction. Missoula has seen a combination of all of these market elements.

On the demand-side we have seen rising incomes and employment levels through 2019. Since 2010, the population of Missoula County has grown from approximately 107,000 to an estimated 116,000 in 2018 - an increase of roughly 8 percent. When looking at in-migration since 2013, over half of those moving into the county have come from another state, and those moving into the county earn higher incomes on average than those moving away. More people with higher incomes in the same location creates competition among buyers and this drives up price levels and reduces affordability.

One indicator of a supply-side constraint is an aggregate aging of housing units. This is currently the case in Missoula County, but it wasn't always this way.

Figure 2 shows that in 1960 almost 30 percent of housing units in Missoula County were less than 10 years old, 17


FOR SALE

Figure 1. In-migration to Missoula County. Source: Internal Revenue Service.

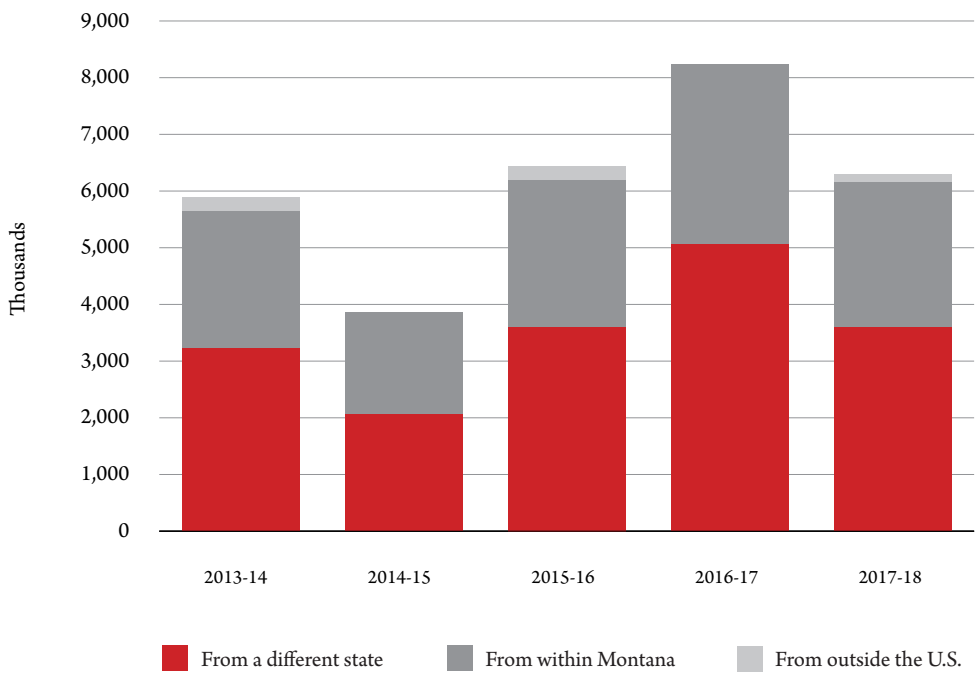
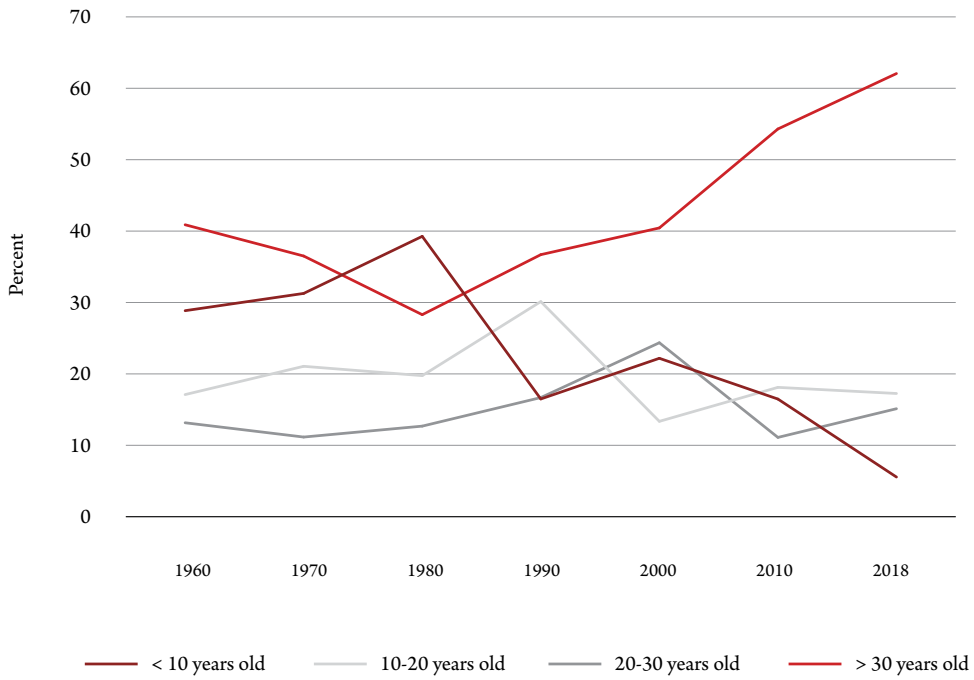


Figure 2. Age of housing units in Missoula County since 1960. Source: U.S. Census Bureau, Decennial Census.



Traffic crosses Main Street in historic downtown Missoula. (Ian Dagnall)

percent of housing units in the county were between 10-20 years old, and roughly 40 percent of units were more than 30 years old. The 1970s were a record-setting year for home building in the county, with over 10,000 housing units added between 1970-79. This resulted in a flipping of proportions. By 1980, almost 40 percent of housing units were less than 10 years old, while structures that were more than 30 years old declined to slightly below 30 percent of available units.

Since then older structures have continuously increased in proportion. The most recent data estimates that structures that are older than 30 years make up approximately 62 percent of housing units in Missoula County, while units less than 10 years old now account for about 5 percent of structures.

Missoula's aging housing base has been exacerbated by sluggish building since 2010. Moreover, estimates show that a large majority of the relatively few homes being built since 2010 are homes targeted for upgrading home buyers. Figure 3 shows the breakdown of new construction by market segment since 2012. It is estimated that less than 30 percent of new construction in Missoula County since 2012 have been entry-level structures. Meanwhile over 60 percent of new construction has contributed to the inventory of higher end move-up housing units.

IT IS ESTIMATED THAT LESS THAN 30 PERCENT OF NEW CONSTRUCTION IN MISSOULA COUNTY SINCE 2012 HAVE BEEN ENTRY-LEVEL STRUCTURES.

Putting this all together, we have witnessed positive net-migration with increasing employment levels and incomes, an aging housing base, and continuously declining new construction, which is aimed mostly at upgrading homes. These ingredients have worsened affordability in Missoula County. As previously mentioned, those households impacted the most are first-time homebuyers and renters.

Figure 4 illustrates this phenomenon. We see that when the housing market crashed in 2008, both high- and low-tier homes were impacted downward together and since 2012

Figure 3. New construction by market segment. Source: American Enterprise Institute.

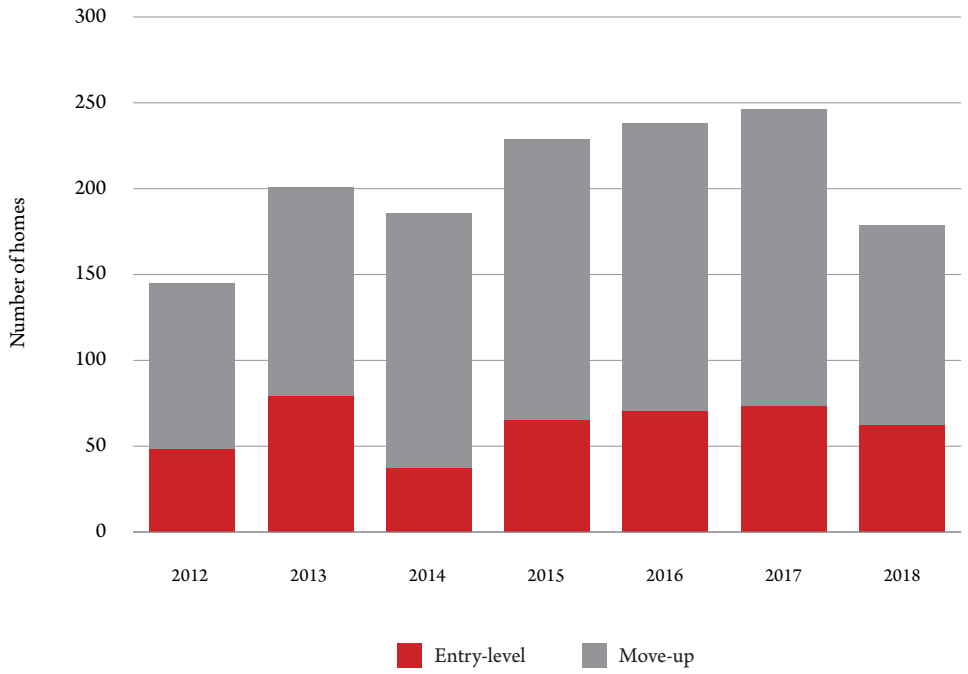


Figure 4. House price index for low- and high-tier homes in Missoula County. Source: Zillow Real Estate Research.

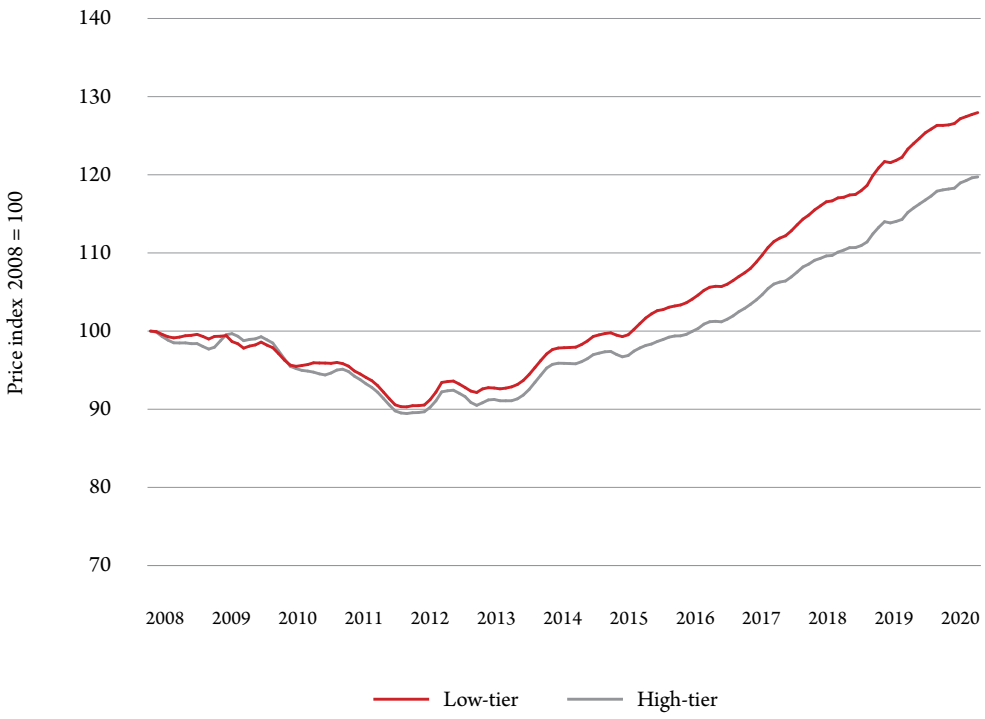
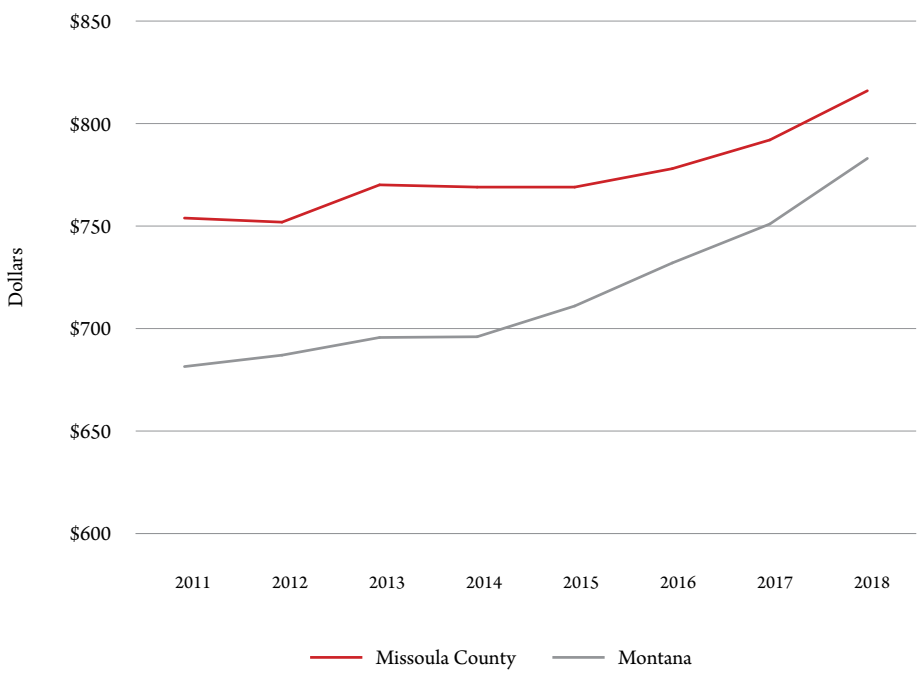


Figure 5. Change in rents for Montana and Missoula County. Source: U.S. Census, American Community Survey.



both have been recovering. However, we can see that low price-tier homes have been increasing in price at a faster rate than high price-tier homes. This has resulted in a premium for entry-level homes, meaning a household in the market for an entry-level home in Missoula County will pay roughly $23k more than if low and high price-tier homes had been appreciating at the same rate. This is a phenomenon seen in all of the major housing markets in Montana.

Figure 5 shows how these market forces have impacted the rental market. While rents have been rising across the board in Montana, rents in Missoula County continue to be higher than state averages.

Affordability will remain an issue in Missoula County and this poses a problem not only for first-time home buyers and renters, but also for employers looking to fill low-to-medium wage jobs.

With the cost of living increasing faster than people's incomes, many are looking for alternatives. As mentioned before, Missoula County has had a positive net-migration over the past several decades. However, since 2011 people have been leaving Missoula County for more affordable counties in close proximity at a faster rate than people moving in. Counties such as Ravalli, Lewis and Clark, Flathead and even Gallatin have been attracting positive net-migration away from Missoula County for all of the last seven years of data.

As long as Missoula remains a relatively unaffordable place for average-earning households, this trend is likely to remain in place.

Brandon Bridge is an economist and director of forecasting at the Bureau of Business and Economic Research.

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The Emergency Student Support Fund was established to assist enrolled students struggling to meet their basic needs during the COVID-19 pandemic. This, and many other important priorities still need to be met.

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COVID-19 CREATES ECONOMIC UNCERTAINTY

What Does the Future Hold for Jobs and Reopening the Economy?

BY ROBERT SONORA

After weeks of bad news, on June 5, the Bureau of Labor Statistics published its May employment situation summary. For businesses, policymakers and economists it was one of the most anticipated employment reports in recent history. Given dismal labor statistics, such as the 43 million initial claims for unemployment insurance since March 21, most economists believed the unemployment rate would rise to over 20 percent. Instead, the data released had completely unexpected results.

During May, the U.S. economy created, though it is probably safer to say rehired, 2.5 million workers. This pushed the unemployment rate down from 14.7 percent to 13.3 percent. Though this statistic has a caveat. A note in the release states:

"If the workers who were recorded as employed, but absent from work due to other reasons (over and above the number absent for other reasons in a typical May) had been classified as unemployed on temporary layoff, the overall unemployment rate would have been about 3 percentage points higher than reported."

That is the unemployment rate should have been 16.3 percent.

But during these uncertain times nothing is as it seems. Over the past three months a torrent of extraordinary events has occurred in the national and global economy. Just as epidemiologists, immunologists, geneticists and other medical professional are trying to understand the SARS-CoV-2 virus (coronavirus) and the associated COVID-19 disease, economists are also trying to analyze the impacts of the virus and resulting policy that has been introduced by this pandemic.

The timeline of the current pandemic is well-known. Sometime in January, the virus entered the country from China on the West Coast and roughly the same time a strain entered the country from Europe on the East Coast after hitting China and Southeast Asia. To contain the virus draconian measures were implemented globally.

In a recent paper, Solomon Hsiang of the Global Policy Laboratory and Goldman School of Public Policy at the University of California, Berkeley, estimated the impact of containment measures on the spread of the coronavirus. Hsiang and his co-authors estimated that the measures implemented

Bella Summers disinfects the cashier stand at The Base Camp in Helena, Montana, on the business's first day open since the lifting of some coronavirus-related closures. (AP Photo, Thom Bridge)

may have averted up to 530 million infections globally. The death rate of COVID-19 has been estimated to be about 1.3 percent, which implies that 6.9 million lives have been saved by the measures. According to Hsiang, the policies that led to the biggest reduction in infection were social distancing, home isolation and business closure. These reduced infection rates by 25 percent, 12 precent and 6 percent respectively. Of course, these measures had an appreciable negative impact on the economy.

Economic Fallout

The general lack of testing, contact tracing and individual self-quarantine, as well as the slow response and misinformation about what was to become a global pandemic, meant that any form of policy would have to be a very blunt instrument. What was required to prevent a highly communicable disease from spreading was to isolate individuals.

The timeliest data available to judge the pain felt in the real economy is the unemployment rate. Using Okun's law (the relationship between unemployment and losses in a country's production), we can guesstimate quarterly real GDP growth rates using monthly unemployment data. Figure 1 shows the monthly unemployment rate and the associated Okun's law GDP growth rate. According to this calculation, current monthly real GDP is shrinking about 9 percent per quarter, which is on par with other estimates. This corresponds to the current official unemployment rate of 13.3 percent.

But a slightly deeper dive into the data has other revelations. First, let's consider gender unemployment rates. For the first time since 1980, the unemployment rate for women is higher than men (Figure 2). In April and May, women's unemployment was about 2 percentage points higher than for men. This reflects the types of industries that males and females are employed in and because women are generally more responsible for child care. For example, retail is largely female dominated.

Figure 3 shows the total job losses by sector from May 2019 to May 2020. The most impacted sectors are leisure and hospitality, health and education, wholesale and retail trade, and manufacturing. Recall that manufacturing continues to be affected by the trade war between the U.S. and China. In previous recessions, male-dominate jobs, especially in construction and heavy manufacturing, were hit the hardest.

Recent turbulence in real economic activity has generated unprecedented changes in individual markets for goods and

financial instruments. Perhaps the most striking example are oil prices, which were negative for a day. Declining demand for oil distillates and a mini-price war between Saudi Arabia and Russia resulted in such a glut of oil in international markets that producers were paying market participants to store the oil. At the closing bell on April 20, oil prices were –$37.98/bbl before recovering to $8.91 the following day.

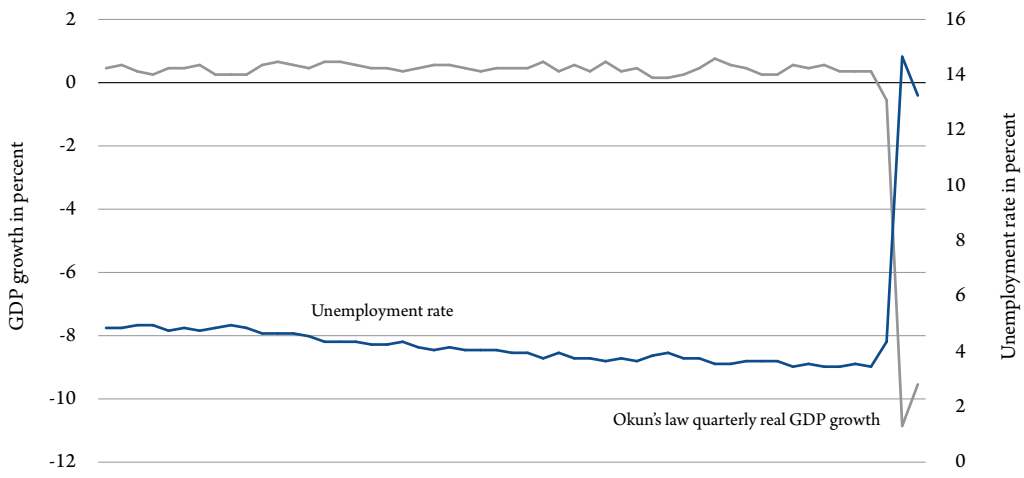


Figure 1. Unemployment rate and Okun's law real GDP quarterly growth. Source: Bureau of Economic Analysis, Bureau of Labor Statistics and the Bureau of Business and Economic Research-UM.

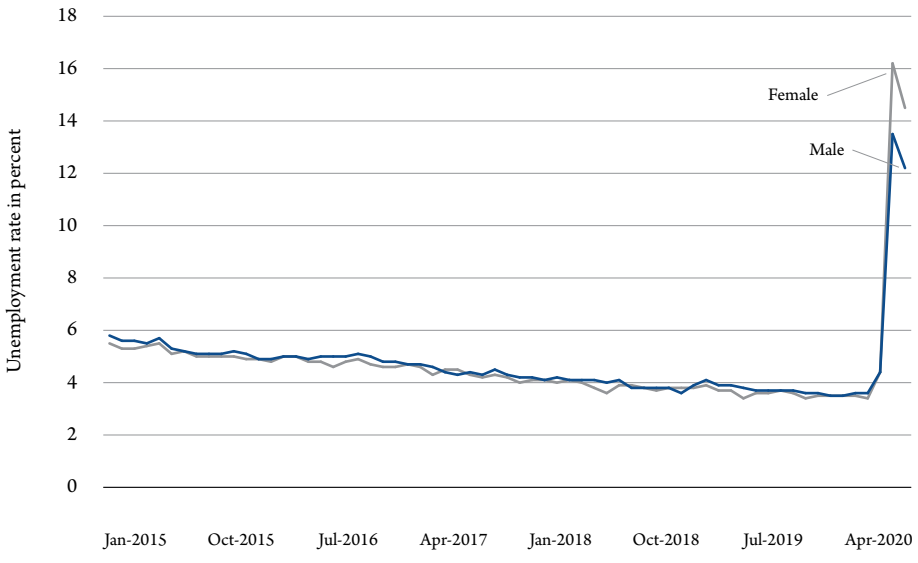
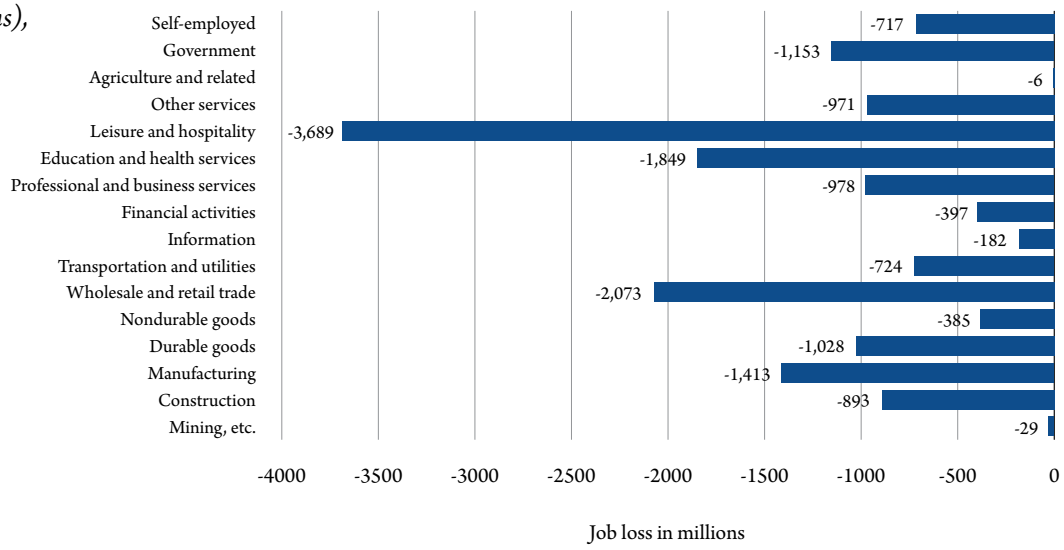


Figure 2. Unemployment by gender. Source: Bureau of Labor Statistics.

Figure 3. Job loss (millions), May 2019-May 2020. Source: Bureau of Labor Statistics



Reopening the Economy

April is when individual states started announcing dates for reopening the economy – most in phases. According to experts, only six states have met the minimum requirements to fully open a state economy. The requirements include, a sustained two-week drop in cases; a low number of daily cases; high testing capacity; less than 5 percent positive tests; and high health care capacity.

Figure 4a-b show the seven-day moving average of new daily coronavirus cases for 10 states from March 20 to June 7. As the figures show, some states have a "w" shape in new cases, such as Florida, Georgia and Tennessee. Florida, in particular, is problematic. New cases are growing faster than in the initial stages of the pandemic – reaching almost 1,400 new cases per day in early June. Perhaps more alarming are the new case counts in North Carolina and Arizona, and to a lesser extent Kentucky, Wisconsin and Utah. These states are only now being affected.

Not all states follow this pattern, but for these states we can already see the echo of being too aggressive in opening their economies. We can also see this in real time data, such as reservations made using OpenTable (an online restaurant-reservation service app). Figure 5 shows the percent difference in reservations made from 2019 to 2020 for the same five states shown in Figure 4a. The three states that have more aggressively opened their economies are the same three states with the fastest rising new cases.

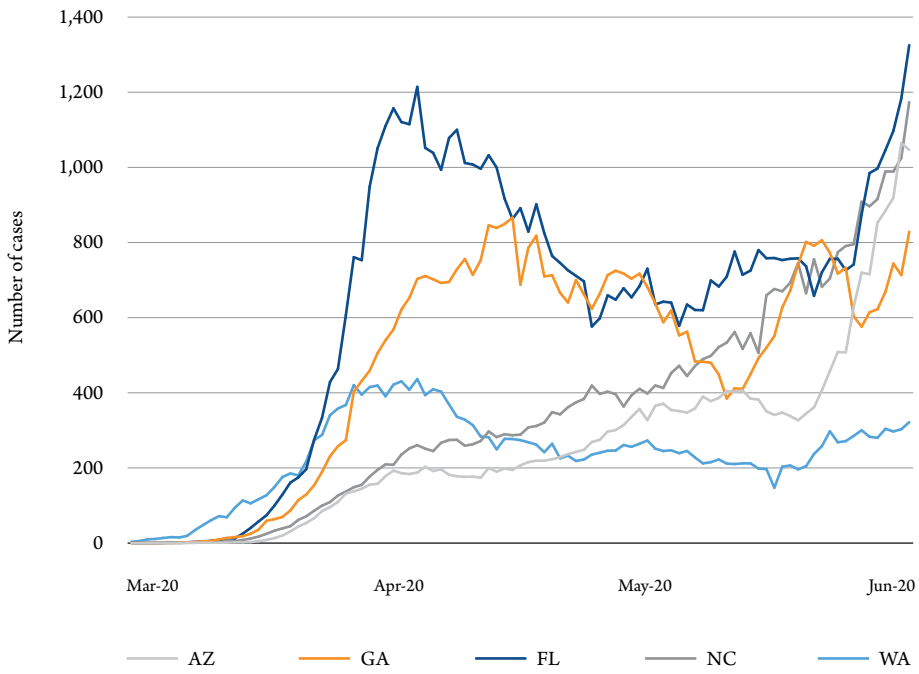
It is interesting to compare Washington with Florida or Georgia. If you look at the reservation data, Washington reservations are down about 90 percent from 2019 levels, whereas Florida is 50 percent lower. On June 7, Washington had about 300 new cases, while Florida was four times higher.

This observation raises an obvious question. Did the rise in cases cause the decline in economic activity proxied by reservations or vice versa? Statistical analysis reveals that both are true. The decline in economic activity has had a statistically significant impact on cases.

Both financial markets and individuals are reacting to short-run conditions. From the household perspective, the success of social distancing has given individuals a false sense of normality, particularly those states that were not hit hard in the first wave of the virus. This is referred to as the "prevention paradox." Given the success of isolation, there is a perception that the pandemic is not extreme, so drastic measures need not be taken.

From the most recent data, it appears that opening the economy will lead to more cases and the potential need to shut down the economy again. However, should that need

Figure 4a-b. New COVID-19 cases, seven-day moving average. Source: John Hopkins CSSE.



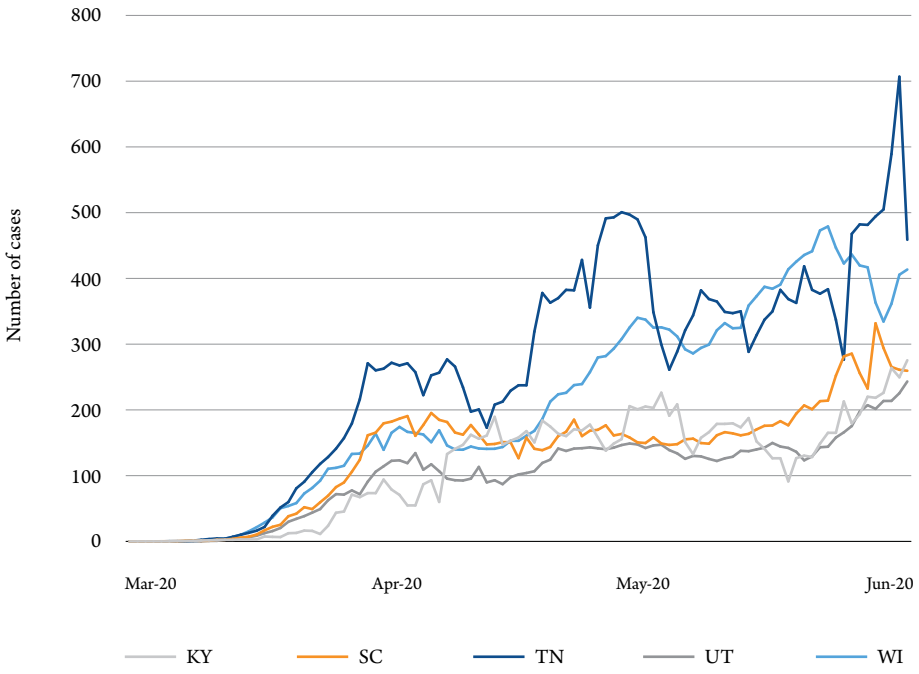
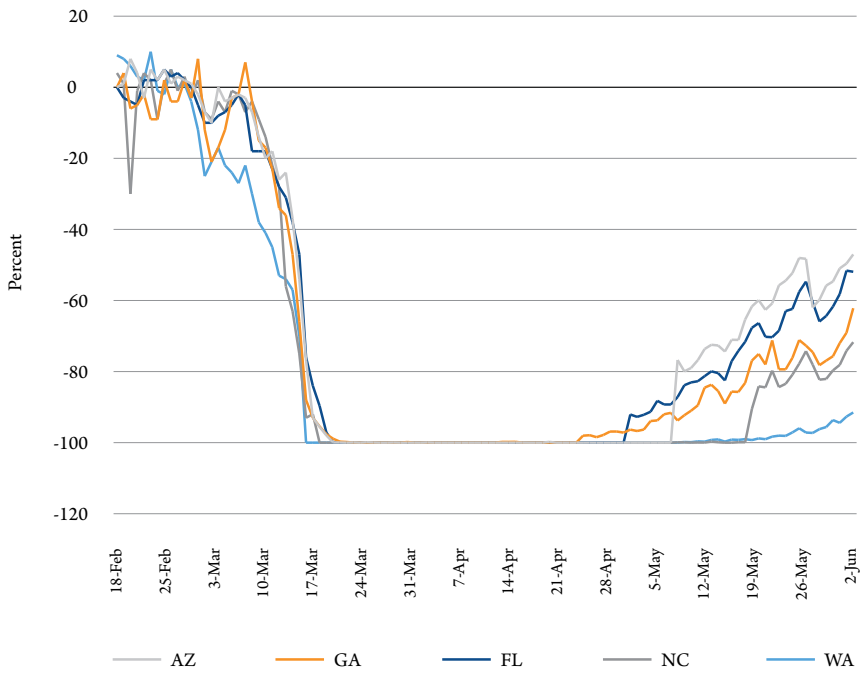


Figure 5. Percent different in restaurant reservations, 2019-2020. Source: OpenTable.



arise in the months ahead the results will likely not be as dramatic. While a vaccine will not be publicly available for upward of a year, testing and contact tracing has improved.

One potential hiccup that requires further discussion is the source of the economic decline. Policy and discussion has focused on demand side impacts. But there are also severe supply side negative shocks, as witnessed by the market movements in commodities. Experts suggest that over half the decline in output in the first five months of 2020 were due to supply side effects.

Summary

The COVID-19 pandemic will be the subject of countless research papers and dissertations for years to come. This is a once-in-a-lifetime event on a global scale that will require global solutions. The disease continues to spread to the Southern Hemisphere and other less developed countries.

The acceleration of known cases in Russia and Brazil are alarming. At current growth levels Russia and Brazil will have over 800,000 and 1 million cases respectively by the first week of July. The growth in the virus outside our borders will ricochet back, but with newer mutated versions.

Epidemiologists foresee three possible scenarios. The first is small waves of outbreaks, following the initial outbreak. The second is a redux of the Spanish flu (1918 flu pandemic) where the initial outbreak was followed by a brief intermission, which proceeded a larger second outbreak, and then a series of outbreak waves. The last scenario could be called the "Groundhog Day" scenario, where history repeats itself.

Whatever economic structure that exists after this pandemic will be one where we must internalize the disease, perhaps for years to come. This will require serious discussions about every aspect of life from child care and education, to defense and international relations.

Robert Sonora is director of health care research and associate director at the Bureau of Business and Economic Research at the University of Montana.

THE ECONOMIC IMPACT OF COVID-19 IN MONTANA

When Can We Expect a Recovery?

BY PATRICK M. BARKEY AND ROBERT SONORA

The unprecedented swift and severe declines in economic activity that have coincided with the outbreak of the global COVID-19 pandemic have not spared Montana. As recently as mid-February, when the Bureau of Business and Economic Research (BBER) was in the midst of its statewide economic outlook tour, Montana was at full employment and enjoying a third consecutive fiscal year of healthy state revenue growth. Declines since then have occurred too quickly to be adequately measured by the most comprehensive economic measures, but when those data become available they will depict a broad-based recession of greater magnitude than what was experienced in 2008-09.

BBER has conducted an analysis of this new economic trajectory to help achieve a better understanding of the economic challenges that governments, businesses and households will face in the coming months. The analysis must be considered preliminary because the fluidity and uncertainty of the evolving health and economic situation make it almost impossible to incorporate all of the relevant information.

The key driver for this analysis is the revision to the U.S. economic outlook between December 2019, when the virus was off the radar for most of us, to April 2020, when its effects have propagated to every continent on earth. The question posed by this analysis is: What does the revised level and composition of national economic activity mean for the Montana economy? Our principal findings are:

- In calendar year 2020, the Montana economy will suffer an average employment decline of more than 50,000 jobs (including payroll, proprietor and contract workers), which represents a decline of 7.3 percent. Job losses will exceed that average in the second quarter of the year, with some improvement expected in the final quarter.
- Personal income (not inflation-corrected) in 2020 will be $3.9 billion lower in Montana than was projected in December, a downward revision of 7.1 percent.
- Almost every major industry in Montana will have lower

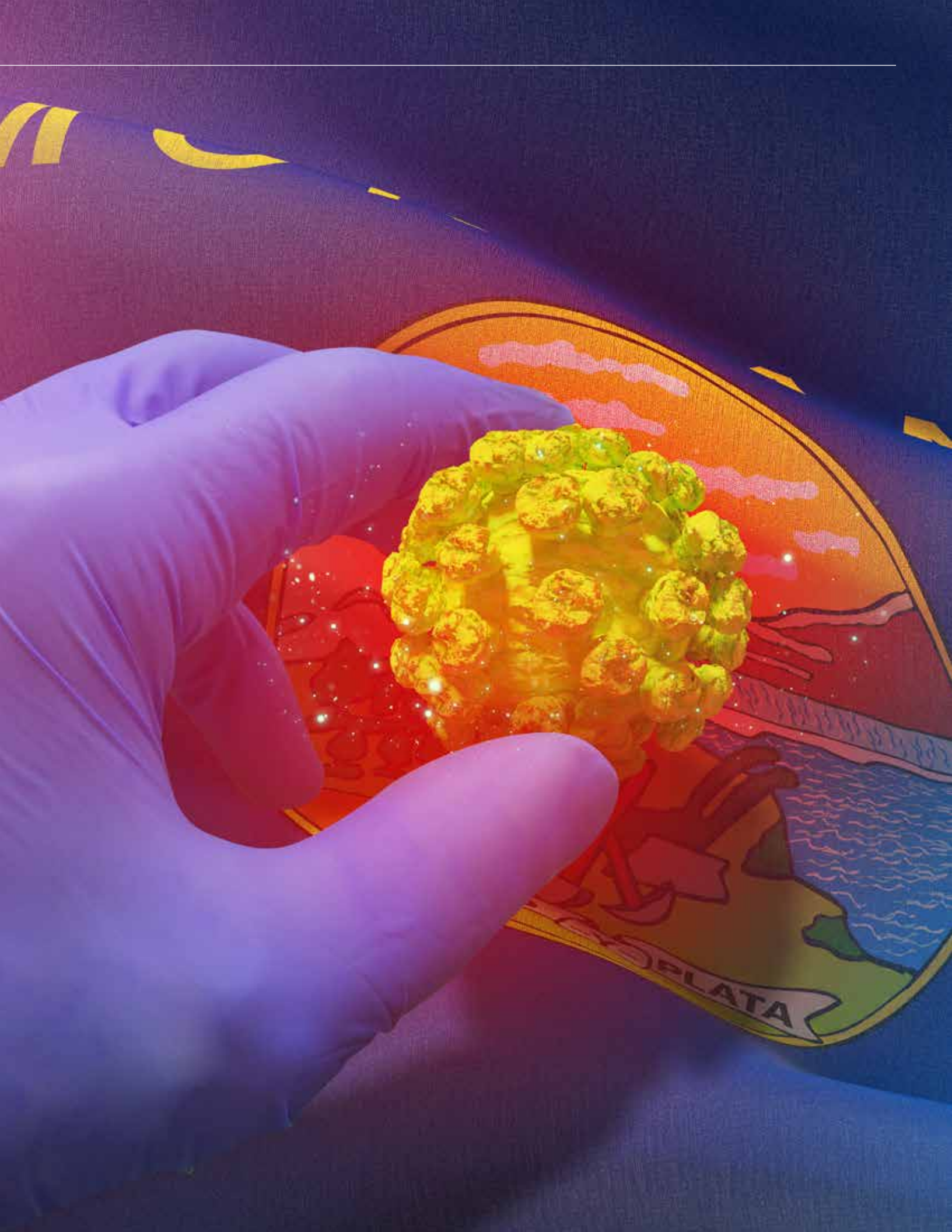

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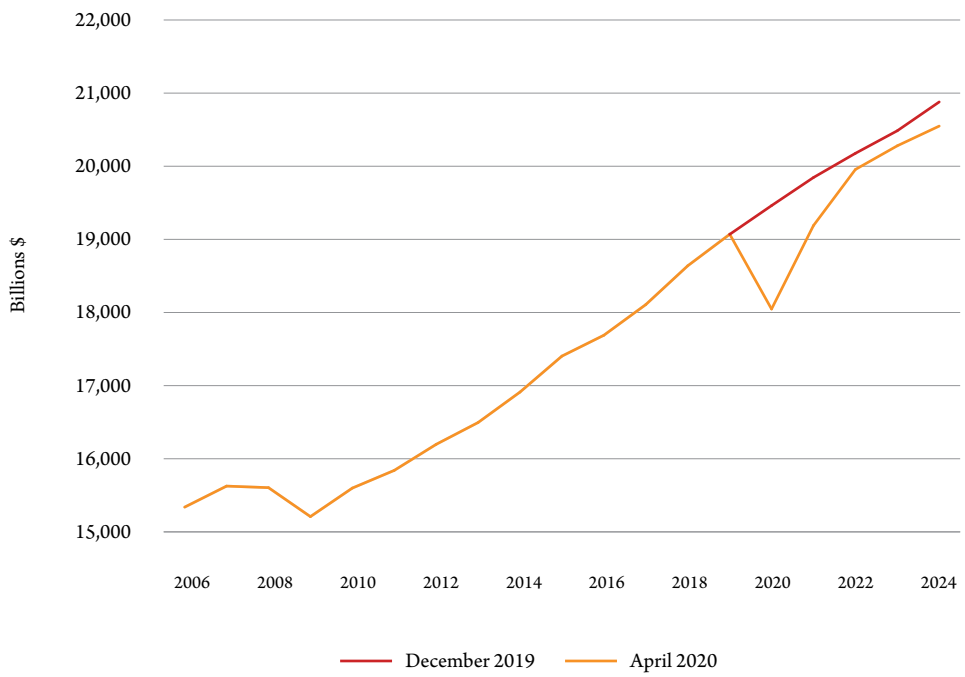
Figure 1. Dec-2019 versus Apr-2020 forecast comparison, real GDP, U.S., billions. Source: IHS Markit.



employment in 2020 due to the COVID-19 contraction, with job losses particularly severe for accommodations and food, retail, arts and entertainment, and personal services businesses. Job losses will be greatest in the northwest region of the state, but every region will experience a significant downturn.

- Stronger economic growth in 2021, and to a lesser extent, 2022 will mostly close the gap and bring economic activity back within range of the medium-term growth projection made before the crisis.

This final point is perhaps the most problematic. It is based on the expectation, described more fully in the next section, that the U.S. economic downturn will be pronounced, but also relatively short. The IHS Markit forecast on which this analysis is based foresees annualized growth kicking up strongly in the fourth quarter of 2020 to double-digit rates. Since an event like the current COVID-19 pandemic lies outside the ordinary experience of economic models, such projections must be treated with caution.

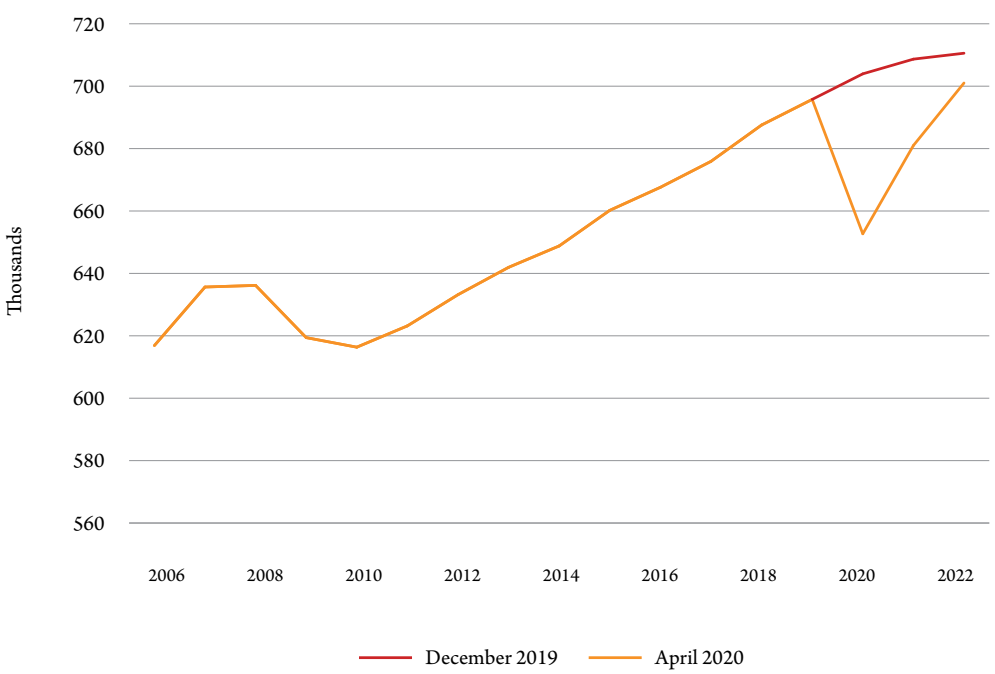
The April 2020 Projection for the U.S. Economy

Three basic questions are posed for forecasters concerning the impact of COVID-19 on the national economy: 1) How much will the economy contract, 2) How long will the contraction last, and 3) What will be the trajectory of the recovery? The last question pertains to the pace of growth coming out of the low point of the downturn – rapid, gradual or something in between.

The answers to these questions for the IHS Markit forecast that the state of Montana subscribes to is apparent from the projection in Figure 1.

The economy is expected to experience a decline in inflation-corrected gross domestic product, the broadest measure of economic output, of 5.4 percent in calendar year 2020. As can be seen from the figure, this decline is much more rapid and much more pronounced than the contraction suffered in 2008-09. The decline is relegated to the year 2020 – the following year is expected to see a considerable amount of makeup growth. In the jargon of forecasting business cycles, the IHS Markit forecast calls for a "V" shaped recovery from the COVID-19 downturn, with economic activity

Figure 2. Dec-2019 versus Apr-2020 forecast comparison, total employment, Montana, thousands. Source: Bureau of Business and Economic Research-UM.



approaching originally projected (December 2019) levels by the year 2022.

It is important to note that the estimate of a 5.4 percent decline in the U.S. economy in 2020 understates the impact of COVID-19 in at least two respects. First, it is an annual figure which averages severe declines in the spring with what are expected to be the beginnings of a robust recovery in the last three months of the year. The IHS Markit forecast of real GDP growth in the second quarter is negative 26.5 percent, at an annual rate.

Montana's April 2020 Projection

BBER prepared two economic projections for the state of Montana using its policy analysis model based on the IHS Markit projections of the U.S. economy. The pre-COVID-19 projection was made based on the pre-COVID-19 U.S. forecast (December 2019). The impact of COVID-19 on the state is made by comparing this old forecast to a new forecast, based on the IHS Markit forecast released in early April. A comparison of these two Montana projections reveals sizable effects of COVID-19 in our state.

A few caveats before we present these comparisons. Since the BBER model is an annual model, we are not able to estimate impacts within each year. Annual estimates for the calendar years are available. Also, since the IHS Markit projection for the U.S. predates the most recent oil price volatility (resulting in WTI crude oil prices going negative), the full effect of chaos in those markets may be understated. Even though the full details of the CARES Act was not available for the preparation of the April U.S. forecast, the broad features of that legislation was anticipated and incorporated into these projections.

The steepness of the employment decline projected for 2020 for Montana (Figure 2) is striking, especially as it comes following nine years of steady growth. The gap between the two projections is more than 51,000 jobs, more than twice as large as the job decline between 2008 and 2010 that Montana experienced in the Great Recession.

The job total shown in Figure 2 differs from the payroll employment concept that is more commonly reported. We report jobs using the definition used by the U.S. Bureau of Economic Analysis, which includes payroll employment

plus self-employed, proprietors and contract workers. Since some individuals hold multiple jobs, this estimated loss slightly overstates the number of people losing their source of earnings.

Our projection swings strongly upward beginning next year, with job gains in 2021 and 2022 taking the economy close to the level of employment that was projected at the end of last year. Even with this pace of recovery, the COVID-19 pandemic results in a three-year period with a smaller economy than was forecasted only four months ago.

At the major industry level, the only sector that escapes job declines in Montana in 2020 is the federal government. Other industries that are less affected by the downturn include agriculture, mining and utilities. As shown in Figure 3, employment effects are particularly harsh for Montana employers in the accommodations and food, retail trade, and arts and entertainment industries.

No region of the state escapes the effects of the COVID-19 economic downturn, as can be seen in Figure 4. While the job losses in 2020 are largest in the northwest region of the state, totaling over 16,000 jobs, population and employment in this region are highest overall as well. In percentage terms, 7.3 percent of jobs statewide are lost in the worst year (2020), with regional jobs losses ranging from 8.1 percent job declines in southwest Montana to 6 percent in the north central region.

Of immediate importance to businesses and governments in Montana is the effect of the COVID-19 downturn on income received by Montana households or personal income. While almost two-thirds of this income comes from earnings associated with employment, a sizable fraction comes from rent, dividends, royalties and rent. All of these sources have been profoundly disrupted by the economic upheaval associated with the pandemic.

The change in the trajectory of Montana personal income (billions of dollars, not inflation-corrected) due to the COVID-19 downturn is visibly larger than what occurred in the Great Recession. Compared to the projection made four months ago, personal income in Montana is projected to be $3.9 billion lower in 2020, a 7.1 percent decline. That represents a considerable decline in spending power for Montana households. It also is a significant erosion in the tax base for Montana, which relies more on the income tax for its general fund revenue than any other source.

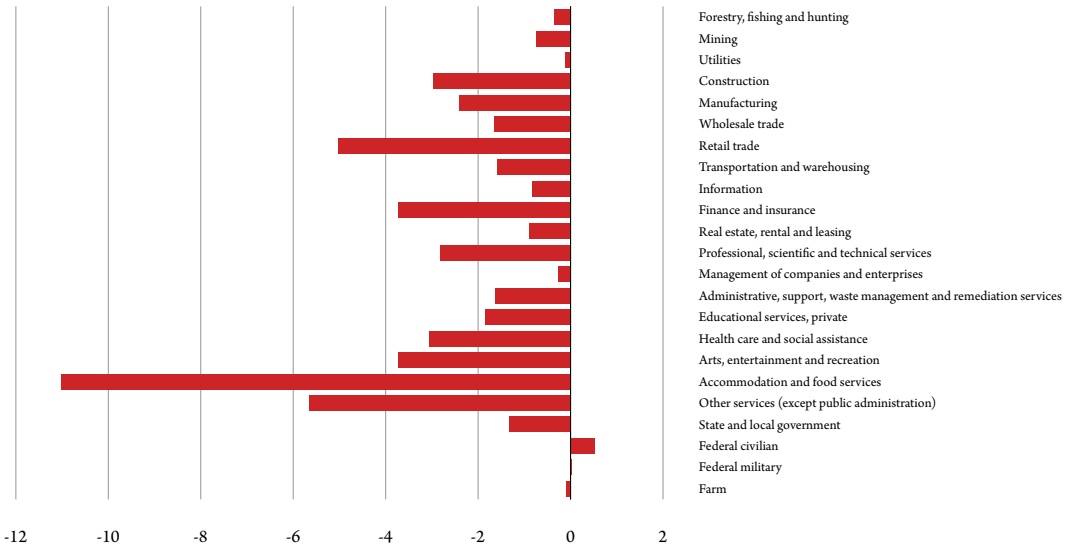
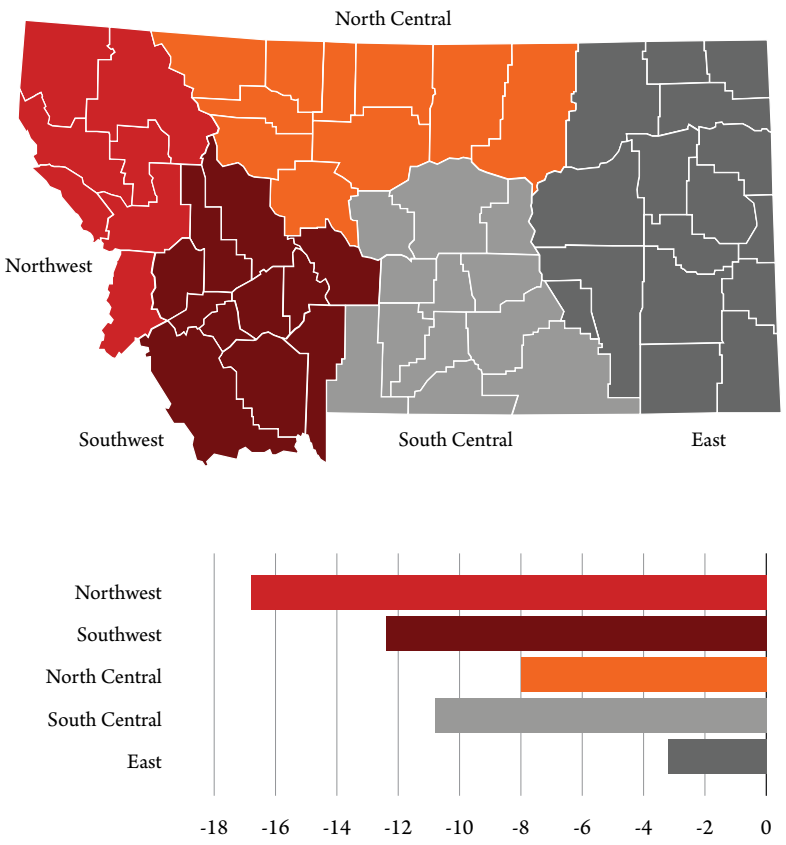


Figure 3. Dec-2019 versus Apr-2020 forecast comparison, 2020 employment by industry, Montana. Source: Bureau of Business and Economic Research-UM.

Figure 4. Dec-2019 versus Apr-2020 forecast comparison, 2020 employment difference by region, thousands. Source: Bureau of Business and Economic Research-UM.



Revisions to the Projections

Nothing that has occurred since we produced these preliminary projections for the Montana economy in April of this year has substantially altered the basic conclusions of our analysis. The COVID-19 recession is still expected to be much more severe than the Great Recession. It will not spare our state, and it will result in lower levels of employment for the next several years, compared to projections made at the end of last year.

But since the time our preliminary projections were made, new information has arrived that has yielded more insights which have changed some aspects of our projections. The dismal first quarter performance of health care was a surprise. So was the unexpected strength of employment in May. We now expect the downturn to cost the state about 70,000 jobs in the year 2020. And the speed of recovery is downgraded as well.

Conclusion

There is little doubt that the COVID-19 pandemic has produced a recession that is more severe than anything Montana has experienced in the postwar period. While events remain extraordinarily fluid and much uncertainty remains, even an optimistic forecast where growth resumes at the end of this year puts the state economy in a hole that takes years to refill. The risks to this forecast are biased, we feel, on the negative side of this projection, with still-to-be-learned aspects of this destructive virus challenging Montana's economy in ways not yet anticipated.

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HIGH-TECH PERSISTS IN THE WAKE OF COVID-19

Montana's Tech Leaders Anticipate Moderate Growth and a Promising Future

BY CHRISTINA QUICK HENDERSON

Montana's high-tech companies came roaring into 2020, reaching the pinnacle of a six-year boom – growing nine times faster than the overall Montana economy, paying twice the median wage, and earning a record $2.5 billion in revenue in 2019.

Tech companies expected to add 2,800 new jobs and make $133 million in capital expenditures at their Montana facilities in 2020, according to an annual survey conducted by the Bureau of Business and Economic Research at the University of Montana.

In January, Bozeman's Next Frontier Capital reported that venture capital investment in Montana companies rose to $150 million in 2019, a more than 500 percent increase in five years. At the end of 2019, Two Bear Capital launched in Whitefish by Michael Goguen, who was a partner for 20 years at Silicon Valley's Sequoia Capital.

Immediately after we captured this snapshot, the outlook changed overnight as the COVID-19 pandemic became a national emergency. Over the past three months, the Montana High Tech Business Alliance has conducted more than 20 interviews with large employers, high-growth startups and investors to piece together a new picture of Montana's tech industry as it navigates COVID-19.

Business Impact

Tech leaders who shepherded companies through previous downturns all said the same thing – this time it was different. Workiva CTO Jeff Trom, noted that past recessions came on gradually, but this time it was "like you hit a brick wall in the course of a week."

One of the most difficult aspects of the crisis has been the inability to predict when the virus will subside and economic free fall will end.

"What drives everybody crazy is the uncertainty and, you know, the truth of the matter is, there isn't going to be certainty for a while," said Trom.

Workiva is a software-as-a-service (SaaS) company headquartered in Iowa with more than 1,000 employees. About 100 of them, including Trom, work from offices in Bozeman and Missoula.

Trom said his business is fortunate that its customers, including government agencies and Fortune 500 firms, are

A logo sign stands outside Cognizant in Englewood, Colorado. Cognizant ATG plans to build a new tech campus in Missoula later this year. (AP Photo, Kristoffer Tripplaar)

stable, though cascading effects from other companies may affect Workiva at some point.

Businesses whose products served an immediate need, such as IT services, or who had large cash reserves or venture capital to rely on, have come through relatively unscathed. In some cases, companies have grown.

Other tech firms suffered heavy losses because their customers were hit hard by the shutdowns – verticals including small businesses, education, retail, restaurants, hospitality and marketing.

Job Losses and Gains

In the early days of the pandemic, a few tech companies that were growing fast at the start of 2020 abruptly lost revenue. To adjust, firms cut nonessential expenses and in some cases laid off workers. Job cuts at impacted companies typically included between 15 and 50 percent of employees.

For tech executives, who have repeatedly cited excellent workers as one of the top benefits of doing business in Montana, layoffs were uniformly deemed awful. But even in the dark cloud of tech job losses, there are silver linings.

Managers did not see recent cuts as permanent job losses and planned to start recalling employees when the economy recovers. Additionally, highly skilled tech workers have good prospects of being rehired. Funds available through the federal CARES Act and its Paycheck Protection Program gave many tech leaders the confidence to keep employees on the payroll.

HIRING FREEZES ARE ENDING AS FIRMS REOPEN OFFICES AND GET MORE COMFORTABLE INTERVIEWING, TRAINING, AND MANAGING NEW EMPLOYEES REMOTELY.

Hiring freezes are ending as firms reopen offices and get more comfortable interviewing, training and managing new employees remotely.

ATG, a Cognizant company, recently announced plans to create 68 jobs in Missoula over the next two years. ATG is preparing to launch the fourth cohort of its All-In Missoula (AIM) program in partnership with the University of Montana. AIM pays trainees from all backgrounds to prepare for high-paying technology careers.

Two Bear Capital founder Michael Goguen said he believes the market for tech jobs in Montana will recover relatively soon as growing companies look for talent.

"I don't think it will be a long time," said Goguen. "Hopefully you'll see a significant ramp up this year in opportunities."

New Opportunities

Investors have capital available but are pulling back temporarily, taking stock of the new environment. Goguen said that based on past crashes, the first reaction of venture capitalists is to freeze investments. But after the initial adjustment period, many venture capital firms are open to pitches.

"It's actually a really good time to invest," said Goguen. "There is a bit of a Darwinian filter, I used to call it, that swept across the ecosystem... it's kind of like only the strong survive. And there were only the best entrepreneurs, the grittiest, the best ideas, in some sense, even having the guts to try to get funding. The rest of them just packed up and went home."

Business leaders believe that while the new economic reality takes shape, serving customers well was the first step of their post-COVID strategy.

"If you don't know the environment you're going to be operating in, how do you plan?" said Andrew Field, Founder and CEO of PFL.com, a marketing technology company in Livingston with more than 300 employees. "We are prioritizing keeping our existing customers happy and their needs met."

PFL was deemed a critical service by the Department of Homeland Security and has continued to provide printing, mailing and fulfillment throughout COVID-19, while strictly following CDC recommendations.

Several companies found that COVID-19 caused drops in some lines of business, but boosted others. PFL lost revenue in verticals, such as printing restaurant menus, but was called on to warehouse and deliver medical supplies and health communications for medical device companies and health insurance providers.

As the coronavirus reshapes business, tech firms are also meeting emerging needs. Quiq is a Bozeman company with about 45 employees whose platform connects customers and companies via text messaging. Quiq's clients in the retail sector, such as Pier 1 and Men's Wearhouse, have been severely impacted by shutdowns.

At the same time, customer service call centers in India and the Philippines closed due to COVID-related shutdowns. The situation created a new demand for tools like Quiq, which allows one agent to help five or more customers simultaneously versus just one agent helping one customer at a time on the phone.

"Adoption of digital engagement tools has been accelerated by years in just a few months," said Mike Myer, Quiq founder and CEO. "Quiq actually doubled the amount of traffic in the platform in six weeks from the beginning of April through early May."

Missoula outdoor technology company onX maps has seen an uptick in usage for its app that helps hunters and off-roaders find new trails and public land.

"We're seeing strong business results, so we feel very grateful that our app is enabling people to get out and do something during this," said onX CEO Laura Orvidas.

OnX is still adding to its team of more than 160 employees in Missoula and Bozeman.

Montana's biotech sector is growing rapidly and adding jobs as scientists race to fight the pandemic. In April, Inimmune, a biotechnology company in Missoula, received a $2.5 million National Institutes of Health grant with the University of Montana to pursue a COVID-19 vaccine. FYR Diagnostics in Missoula, funded by Two Bear Capital, is developing a better, faster test for COVID-19.

Health care technology companies like Pulsara in Bozeman and PatientOne in Missoula have seen a surge in demand for their telehealth platforms.

"The COVID pandemic and crisis created almost an overnight understanding of the clinical and public health benefits of remotely monitoring at-risk patients in their home," said PatientOne CEO Jeff Fee.

Workplace Transformation

One sentiment was near universal among tech companies – the transition to working from home was easier than expected. Fears of reduced productivity that kept employers from implementing remote work broadly before the pandemic never materialized; in fact, many managers saw that work output increased.

"There's always the kind of pointy-haired boss perception of like, well, people are home, they're not going to be working as hard," said Quiq CEO Mike Myer. "That hasn't really happened. The team's productivity has been great."

The main concerns in the first months of the pandemic were communicating effectively and keeping teams mentally and physically healthy. As everyone shifted to working from home, managers organized virtual happy hours, cooking contests, group yoga over Zoom or shipped free cookies by mail.

In states like Montana where case counts have been low, employees are more likely to return to the office as stay-at-home orders are lifted, but tech businesses are not in a rush to come back. Many leaders said they would allow or encourage remote work through the summer or indefinitely.

"I would say in the future, we'll probably have a lot more people that work from home, or from home more regularly," said Myer. "We'll have an office that will probably get used more for collaboration and meeting, and maybe less for getting work done individually."

Returning employees are encountering workplaces with elaborate new routines and reconfigured spaces designed to keep them healthy. Applied Materials (AMAT) is a global corporation with around 30,000 worldwide employees that supplies equipment for the manufacture of semiconductor chips. AMAT employs about 450 people at its facilities in Kalispell, according to General Manager Brian Aegerter.

AMAT has implemented several policies as part of a phased site response plan, including travel restrictions, paid self-quarantine, limiting in-person meetings and on-site visitors, and remote work when possible. For the 300 employees who have continued to work on-site during the pandemic, new practices have been instituted, including alternating schedules, social distancing, enhanced cleaning, physical dividers and personal protective equipment such as masks and gloves. Employees are also protected by strict health screening procedures upon building entry.

Montana Advantages

For the sixth year, tech leaders reported that Montana's quality of life provides them a significant advantage in business. This benefit has been amplified by COVID-19, as Montana residents have abundant opportunities to safely enjoy nature.

Montana businesses also avoid health concerns in dense urban areas, such as elevators in 70-story high rises. CDC recommendations to limit the use of public transportation are irrelevant to employees who bike or drive their own cars to work.

And Montana's low case counts could make the state even more appealing to knowledge workers as remote work becomes more commonplace. Some tech insiders saw worker dissatisfaction with urban centers prior to the pandemic.

"If you just watched the direction that places like Silicon Valley were going, it was heading for a bubble to burst in that traffic, wages, rents, everything were just getting to that breaking point," said Goguen. "I think it was true in other highly dense urban areas – New York and Boston. Already there was a sort of force that said, gosh you know, why does it have to be Silicon Valley?"

Christina Quick Henderson is founding executive director of the Montana High Tech Business Alliance and an instructor in the College of Business at the University of Montana.

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