



**Using Market Demand to Manage Production Levels
COVID-19 Market Demand Analysis and Forecast 1.0
For Utah Manufacturers 2021-2025**

October 2020

Message from UIRA

Dear Utah Manufacturers

October 2020

COVID-19 will continue to impact end-user's behavior, which changes the market demand for the products produced by Utah manufacturers. As manufacturers work through stabilization and into a return to growth, it will be essential to understand which behaviors – if any – will return to pre-COVID-19 patterns, some markets will undergo a temporary transition, and some markets will have changed for good. The new market demand will determine how Utah manufacturers scale production. Certain end-users, such as parts of the health care industry, are likely to see increased demand. Others, such as those in aerospace, are likely to experience severe decreased demand before returning to pre-COVID-19 levels. It is certain that post COVID-19 market demand for Utah manufactured products will not be the same as pre-COVID-19.

Since individual manufacturers do not have the resources to estimate and project the impending changes in market demand, the Utah Industrial Resource Alliance (UIRA) is taking the lead in doing the research to set the foundations in this study for a forecast of the economic factors impacting the end-user demand for the products produced by Utah manufacturers.

COVID-19 Market Demand Analysis and Forecast 1.0 provides an outlook and forecast for the products produced by Utah's manufacturers. This analysis will be updated quarterly, as new data is available. The next version will be released in the first quarter of 2021.

In addition to this study, UIRA will be providing tools and one-to-one counseling to help guide the Utah manufacturers in right sizing production to meet the new market demand.

The Utah Industrial Resource Alliance



About this Study

This research was conducted under funding from the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) to help Utah manufacturers understand factors affecting the underlying demand for products in the post-COVID-19 recovery period. The study is ongoing and will be updated every quarter until recovery. UIRA is developing an interactive tool which will provide Utah manufacturers customized outlook for their business.

About the Authors

This study was conducted by Dr. Tulinda Larsen, Executive Director, Utah Advanced Materials and Manufacturing Initiative (UAMMI) and Mr. David Beckerman. Dr. Larsen has been a practicing economist for more than 40 years. She earned her B.A. and M.S. in Economics from The George Washington University and her Doctor of Management from the University of Maryland Global Campus. Mr. Beckerman has been analyzing economic impacts on the aerospace industry for more than 30 years. He earned his B.A. from the University of Virginia and M.B.A. from Emory University - Goizueta Business School.

About UIRA

The Utah Industry Resource Alliance (UIRA) is a vital economic development organization chartered specifically to help Utah manufacturing industry and rural Utah businesses. The UIRA provides services and outreach to all 29 Utah counties and focuses on improving the bottom line through concepts like Process Improvement & Operational Efficiencies, Supply Chain Optimization, Cybersecurity Planning, Technical Consulting, and Quality Systems and Certifications, while growing the entire company through the adoption of new technologies, workforce development, strategic planning and expanded markets. UIRA aims to assist Utah manufacturing businesses to:

- Grow Revenues
- Increase Outputs
- Decrease Waste
- Manage Production

The UIRA is the premier source for assessing needs and providing solutions available through public and private resources. We live and work in communities across the state. Our primary focus is to help Utah's manufacturing industry thrive.

Members of the UIRA include: UUMEP, USU Extension Program, iMpactUtah, Utah Manufactures Association, Utah Advanced Materials and Manufacturing Initiative, Utah World Trade Center, and Utah Inland Port.

Limitations

This study was conducted on behalf of the UIRA by the Utah Advanced Materials and Manufacturing Initiative (UAMMI). These are especially difficult times to provide a forecast due to the volatility of the economic factors in the COVID-19 period. Both implicit and explicit assumptions that underlie the analysis presented here are based on the expert opinion of the authors. Should any of these assumptions change or prove to be false, the conclusions of this study may be significantly impacted. This study is not intended to be used for financial investment decisions and any such decisions are taken at the sole risk of the party making the decisions.

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Acknowledgements

Appreciation is expressed to the National Institute of Standards and Technology (NIST) for the historic North American Industry Classification System (NAICS) code data, National Association of Manufacturers for market outlooks, Utah World Trade Center for analysis based on Euromoney data, Utah Department of Workforce Services for employment data, and the Kem C. Gardner Policy Center for reviewing underlying assumptions.

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BEA	Bureau of Economic Analysis
GDP	Gross Domestic Product
UAMMI	Utah Advanced Materials and Manufacturing Initiative
UIRA	Utah Industry Resource Alliance

Utah Manufacturer Market Demand Overview

Utah manufacturers are expected to face a difficult two to three years to recovery to pre-COVID-19 levels. However, based on the analysis conducted for this study, Utah manufacturers exhibit the resiliency required to rebound from the impacts of the COVID-19 pandemic.

Recovery and return to growth will be different among manufacturers. Manufacturers with a focus on home products and defense contracts have rebounded and are growing rapidly, while petroleum and aerospace will take many years to recover. Figure 1 provides a summary of our findings, based on 2nd quarter results for the top products made by Utah's manufacturers.

Outlook for Utah Manufactures by Sector

Status	Product Type	Outlook
	Petroleum & Coal Products	Faced massive downturn in 2Q with a 54% drop due to less air travel and less individual trips by cars. Partially offset by more delivery services.
	Medical Equipment and Pharmaceuticals	Short term downturn in 2Q due to cancelling elective procedures. Expected recovery to growth with return to these procedures.
	Aerospace and Defense	Air travel virtually halted and is not recovering. Boeing forecasts long recovery for commercial aviation. Defense contracting is relatively stable but cannot offset the declines in commercial aviation.
	Automotive	Despite the initial drop-off in sales as the pandemic took hold, carmakers are ramping up production as society adjusts to new work environment. Families are staying closer to home, leading to increases in RV sales.
	Food Products	Food demand is generally thought of as steady but have shifted from restaurants to homes. Food manufacturers distributing primarily to restaurants and institutions, are being impacted greater than suppliers to grocery stores. Supply chain disruptions are also impacting this sector.
	Metals	Metals manufacturing was already in a decline before COVID-19. Dependence on other sectors, including oil & gas, aerospace, and automotive, is driving down demand for metals manufacturing. In Utah, Rio Tinto typically drives the metals market, but Rio Tinto has had delays in restarting the smelter and in not currently producing copper.
	Recreational Equipment	Demand for bikes, exercise equipment, and outdoor supplies, including camping and skiing, has increased during this period as people find COVID-19 activities close to home. Supply chain disruptions have been the biggest challenge for this sector.

Figure 1 Utah Manufacturer Outlook by Sector

In our outlook for Utah's manufacturers we expect there will be three phases to return to growth beyond 2019 levels. In Phase 1: Recovery, the free-fall has stopped, and shutdowns are not widespread. In Phase 2: Reset, the economic adjusts to the new normal as we learn to work, while maintaining safe health practices, and in Phase 3: Growth, the economy returns to growth and exceeds the economic performance of 2019.

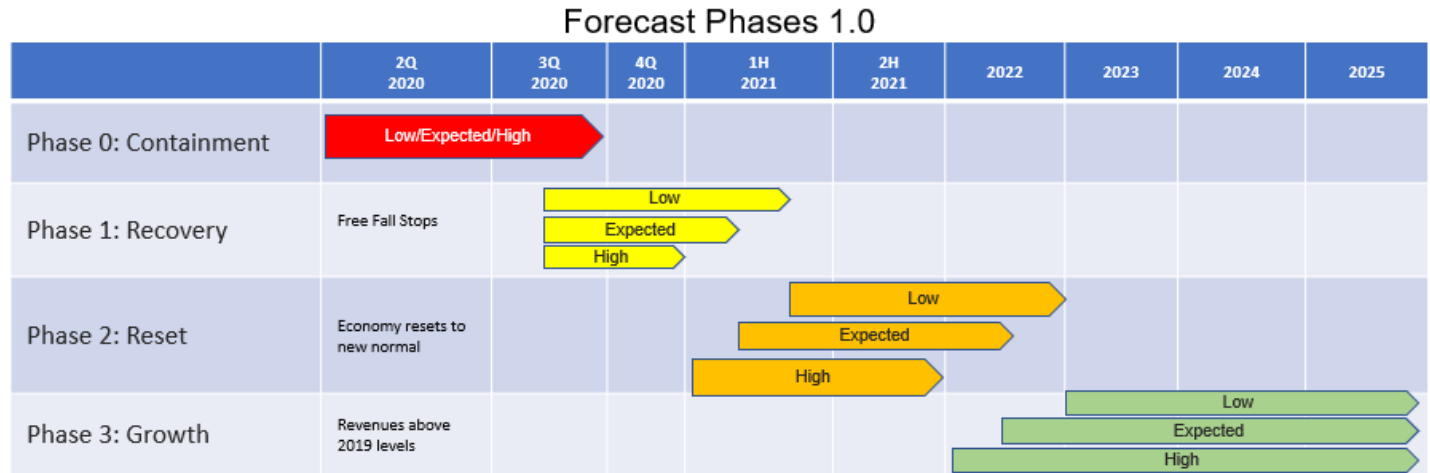


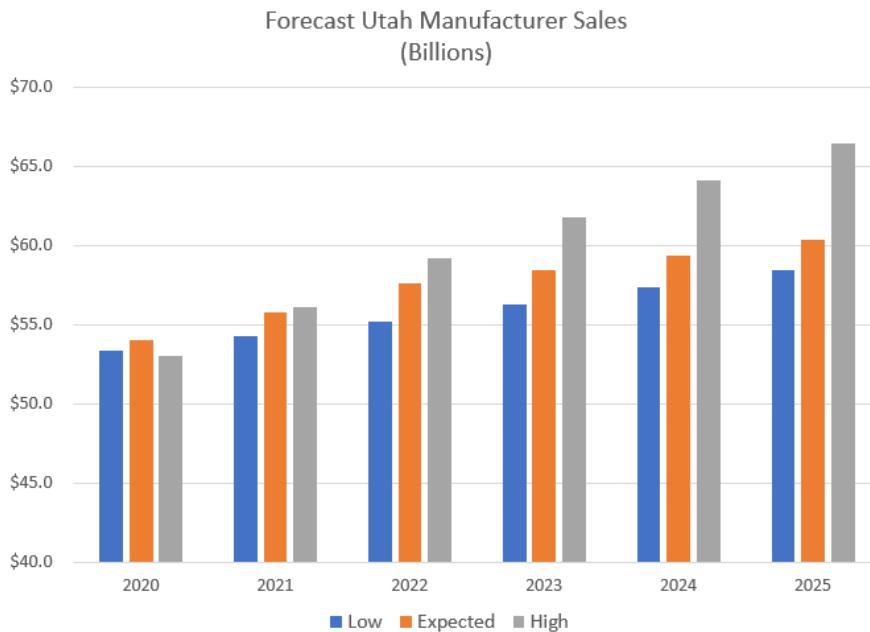
Figure 2 Forecast 1.0 Phases

In addition, we considered three scenarios for growth in Gross Domestic Product (GDP):

Scenario	Description	GDP Assumptions					
		2020	2021	2022	2023	2024	2025
Low	Significant 2nd wave, no vaccine widely available, infection rates continue to increase	-5%	1.7%	1.7%	1.9%	1.9%	1.9%
Expected	Vaccine found, but not widely available, no 2nd wave and infection rates stabilize, society learns to live/work with virus	-3.8%	3.2%	3.2%	1.5%	1.6%	1.7%
High	Vaccine is widely available, no 2nd wave, infection rates decline, society learns to live/work with virus	-5.6%	5.7%	5.5%	4.4%	3.8%	3.6%

Figure 3 Forecast Scenarios

The three forecast scenarios – low, expected, and high – refer to cumulative performance over the entire forecast period. Consequently, by 2025 the low scenario has the weakest GDP performance of the three scenarios; the high scenario has the strongest performance over that period. This does not mean, however, that each individual year's projected GDP in the low scenario is the lowest of all the scenarios (nor the high, the highest). Indeed, the high scenario has the lowest GDP performance of any scenario for 2020. It is in part because of a sharp initial GDP decline that engenders strong GDP recovery in later periods. This reflects the ability of the economy to change and adapt to a changing environment. The 5.0% decline in the low scenario, however, is followed by weaker economic activity that reflects a weaker ability to adapt than in either the expected or high cases.



Under these scenarios, and based on 2nd quarter data, Utah manufacturers return to growth along different timelines. In 2019 total sales were \$56 billion. A return to pre-COVID-19 sales comes remarkably close to happening as early as 2021 in the high case and by 2022 in the expected, but not until 2023 in the low case.

Below is a summary, or scorecard, for the economic factors considered in this study, which we will be updating with Using Market Demand to Manage Production Levels: COVID-19 Market Demand Analysis and Forecast 2.0 For Utah Manufacturers 2021 – 2025:

Figure 4 Forecast Utah Manufacture Sales 2020 - 2025

Economic Factors	Year-over-Year	2019/2018
	National	Utah
Employment	2.2%	3.0%
Real Consumer Spending	2.4%	5.4% (2018)
Residential Investment	-1.7%	To be determined
Real Capital Spending	2.9%	To be determined
Exports	-0.1%	15.0%

Figure 5 Economic Factors

Utah's manufacturing industry entered the recession caused by COVID-19 on a strong base and is expected to return to growth over the next five years. This overall forecast and company specific forecasts in Using Market Demand to Manage Production Levels COVID-19 Market Demand Analysis and Forecast 2.0, expected to be released in early 2021, will provide benchmarks for Utah's manufacturers to adjust production rates and resources to meet the new market demands resulting from the impacts of COVID-19.

The Market Demand Outlook

Using Market Demand to Manage Production Levels: COVID-19 Market Demand Analysis and Forecast 1.0 For Utah Manufacturers 2021 – 2025 research was conducted under funding from the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) to help Utah manufacturers understand factors that affect the underlying demand for products in the post-COVID-19 recovery period. Analysis was conducted from June through September 2020 and brings together relevant economic data that will impact the end-user demand for the products produced by Utah manufacturers.

It is clear that COVID-19 will impact end-users' behavior, which will change the market demand for Utah manufactured products in both the short-term and long-term. As manufacturers work through stabilization and recovery, followed by resetting production and finally returning to growth, it will be essential to understand which behaviors – if any – will return to their pre-COVID-19 patterns, which will undergo a temporary transition, and some will have permanently changed. The new market demand will determine how Utah manufacturers scale production. Certain end-users, such as those in the health care industry, are likely to see increased demand. Others, such as those in aerospace, are likely to experience severe decreased demand before returning to pre-COVID-19 levels. It is certain that post-COVID-19 market demand for Utah manufactured products will not be the same as pre-COVID-19.

Methodology

Evidence-based research, using literature searches and analysis of certain economic datasets, was used to develop an understanding of the macro market demand factors impacting manufacturing in the United States and the demand factors for specific industries where Utah manufacturers provide products. The data for Utah manufacturers was gathered by using the North American Industry Classification System (NAICS) codes.

COVID-19 Market Demand Analysis and Forecast 1.0 data and analysis are based on economic data from 2020 second quarter. As we are starting to receive third quarter data and enter into fourth quarter, conditions seem to be deteriorating with the increased infection rates of COVID-19, the ending of government programs to help workers and small businesses, and the major declines in petroleum, gas, and aerospace. COVID-19 Market Demand Analysis and Forecast 2.0, which will be released in early 2021 will take into account the changes in fourth quarter 2020.

The analysis and forecast are for the period 2021 through 2025. The results will be updated quarterly using the above-referenced scorecard, based on available data.

Two Kem C. Gardner studies set the foundation and starting point for this analysis. The first is the Utah Leads Together series of reports to help Utah businesses reactivate operations in response to the impacts of COVID-19. The second is the study commissioned by the Governor's Office of Economic Development released in May 2020, *The Economic Impacts of Utah Manufacturing Industry, 2019*.

Utah Leads Together

On March 24, 2020, Utah Governor Gary Herbert released the first version of Utah Leads Together 1.0, a comprehensive task force plan to mitigate the economic consequences of COVID-19.

The Utah Leads Together economic response plan recognized the value of facing uncertainty with a dynamic, data-informed, and unified plan. It gave structure and order to what can otherwise be an unclear and difficult reality.

The plan introduced three phases of response: urgent, stabilization, and recovery. These phases were meant to help businesses correctly balance the health of employees with planning imperatives necessary for continuing operations.

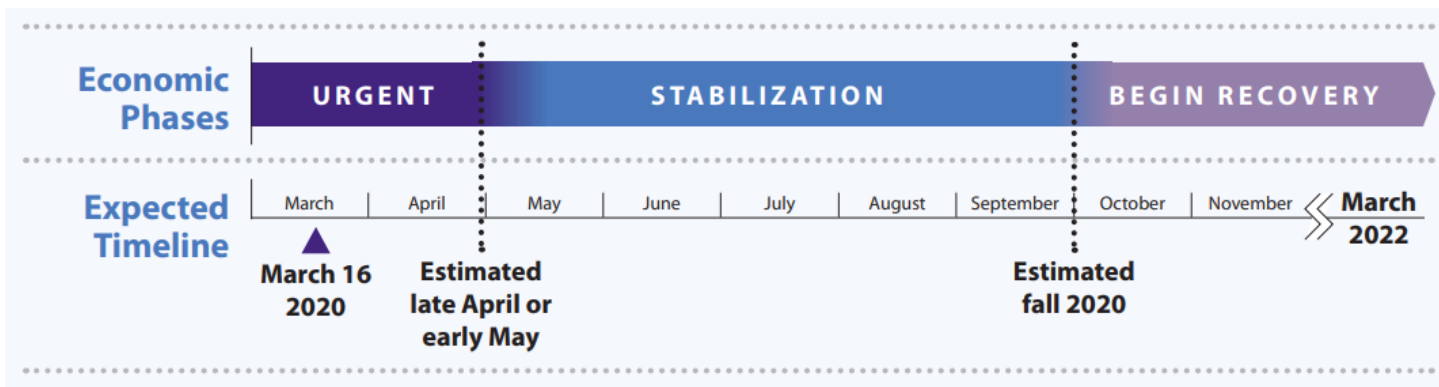


Figure 6 Utah Leads Together Economic Phases

Source: Utah Leads Together 1.0

Utah Leads Together 2.0 , released April 14, 2020, introduced the concept of phases of reactivation of the Utah economy based on each sector's risk profile. The plan provided a color-coded health guidance system with four levels of activity: red, orange, yellow, and green.

On May 20, 2020, the Utah Leads Together 3.0 plan was released. It added onto the previous two versions by presenting critical instructions for high-risk populations, addressing impacts to Utah's multi-cultural community, and planting seeds for Utah's ultimate recovery. High-risk populations, including those aged 65 years and older, have been greatly affected by COVID-19. Version 3.0 outlines the plan to protect these individuals.



Figure 7 Utah Leads Together Color Coded Risk Factors

Additionally, the multi-cultural community has seen a disproportionate amount of illness and death related to COVID-19. Version 3.0 outlines specific actions to address this disparity.

Released June 17, 2020, Utah Leads Together 4.0 presents Utah's economic recovery and revitalization plan. The plan defines economic recovery via two labor market measures: job growth and unemployment. According to Utah Leads Together, recovery starts when net job losses stop, and net job gains begin and is completed when Utah reaches full employment (all workers who are able and want to work are employed).

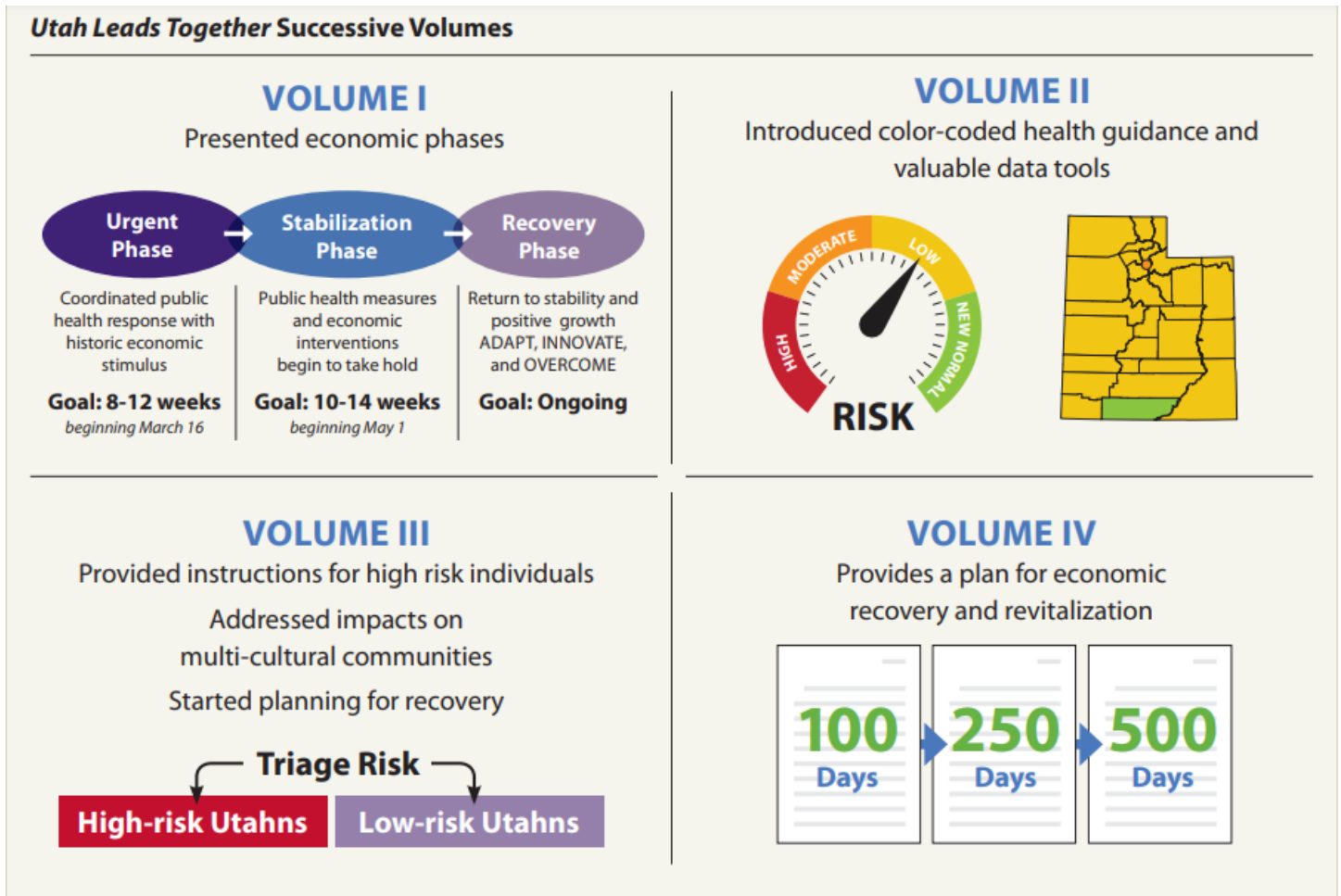


Figure 9 Summary of Utah Leads Together

The most recent report in the Utah Leads Together series was released September 3, 2020 as Accountability Framework: Focusing and Redoubling Our Efforts¹. This report sets out six metrics to measure - recovery: three health metrics, and three economic and societal¹ metrics.

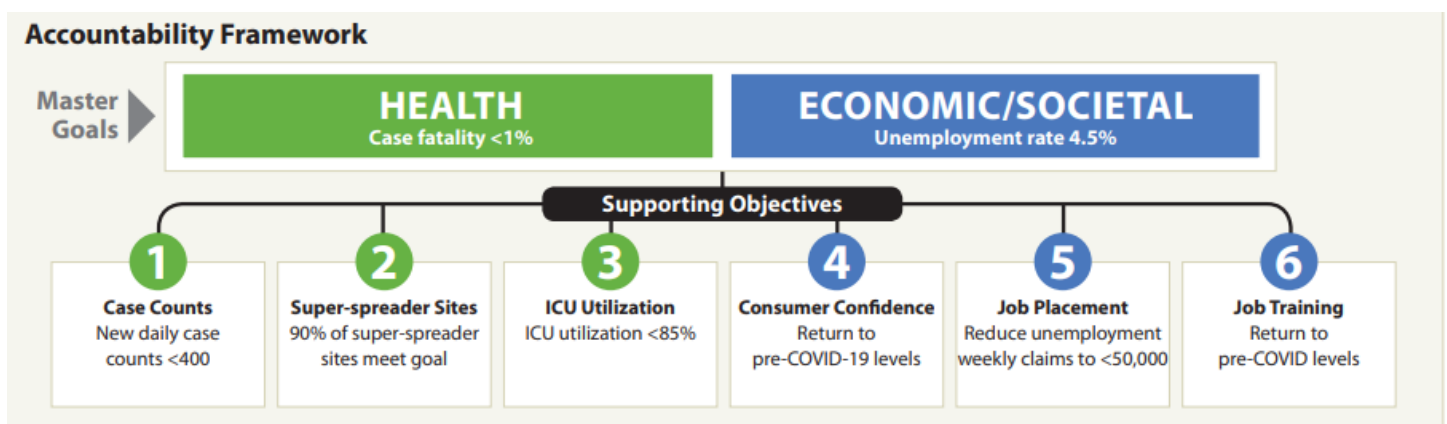


Figure 8 Accountability Framework

¹ Utah Leads Together 1.0 and 2.0 can be found on www.coronavirus.utah.gov/business

In October, Utah's COVID-19 infection rates increased, which led to the Governor announcing new measures to reduce the infection rates. The transition from the phased guidelines of red, orange, yellow and green to the new COVID-19 Transmission Index was done to further strengthen the balance in Utah's response to protect communities. The transmission index clarifies the public health metrics used to determine which counties are placed in which transmission level. Counties will be placed in one of three transmission levels: High, Moderate, or Low. These levels correspond directly to case rates, positivity rates, and ICU utilization. Actions, such as reducing the number of people in social gathering, were proposed based on the transmission levels.

The Economic Impacts of Utah's Manufacturing Industry, 2018

The Economic Impacts of Utah's Manufacturing Industry, 2018 was commissioned by the Governor's Office of Economic Development in 2019 and released in May 2020. The study found that manufacturing is one of Utah's largest industries and makes significant contributions to the state's economy in terms of employment, earnings, and contribution to Gross Domestic Product (GDP). Utah's manufacturing industry accounted for 7.0% of total employment, paid 9.6% of total earnings, and produced 11.0% of gross domestic product.

In 2018, manufacturing was the 5th largest industry in terms of jobs and accounted for more than 143,000 jobs. Over the past decade, manufacturing employment has grown by 0.8% annually. Average earnings in the manufacturing industry rank fourth at \$72,565, 38.6% higher than the statewide average for all industries. Manufacturing earnings have grown an average of 1.4% per year, slower than the rest of Utah's economy but much faster than the 0.2% national manufacturing growth rate.

Manufacturing is Utah's third-largest source of GDP and second-largest private sector industry. Manufacturing GDP has grown an average of 2.0% annually in Utah, twice the national rate.

The Kem C. Gardner Institute estimated the statewide economic and fiscal impacts of Utah's manufacturing sector, including direct, and indirect benefits, which are 427,980 jobs, \$26.4 billion in earnings, and \$44.0 billion in GDP. Overall, manufacturing supports one-fifth of all jobs and one-quarter of the state's total GDP and earnings. The estimated total net fiscal impact is \$606 million in state operating revenues.

This study uses the analysis of the Utah manufacturing industry as the basis for economic forecasts for impacts of COVID-19 on the recovery, reset and growth of revenues over the next five years.



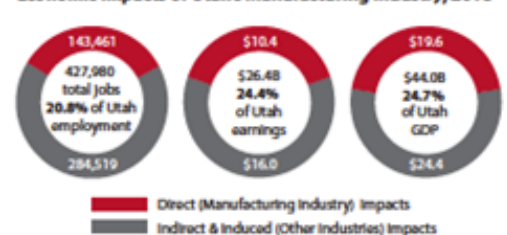
Figure 10 Utah Transmission Guidance

Manufacturing Industry Growth in Utah and the United States, 2018

	Billions	10-Year Annual Growth	One-Year Annual Growth
Gross Domestic Product			
Utah	\$19.6	2.0%	4.9%
US	\$2,321.2	1.0%	3.7%
Employment			
Utah	143,461	0.8%	3.0%
US	13,501,300	-0.3%	2.0%
Earnings			
Utah	\$10.4	1.4%	3.3%
US	\$1,155.7	0.2%	2.2%

Note: Ten-year growth calculated as compound annual growth. Dollar amounts in constant 2018 dollars.
Source: Bureau of Economic Analysis

Economic Impacts of Utah's Manufacturing Industry, 2018



Source: Kem C. Gardner Policy Institute analysis of Bureau of Economic Analysis data using the REM PI+ v2.3.1 model

Figure 11 Manufacturing Growth and Economic Impacts

Underlying Macro Economic Factors

In conducting this research, certain key macroeconomic factors were considered, including Gross Domestic Product (GDP) and historic trends.

Recession or Depression

A recession is often defined as two consecutive quarters with negative GDP. Based on this definition, the U.S. entered a recession earlier this year. First quarter 2020 GDP fell 5.0% over the previous quarter, followed by a second quarter decline of 31.7%. That staggering second quarter decline indicates, however, that this is not a normal recession. Most recessions have negative activity leading up over an average of six months to the decline in GDP, yet quarterly GDP was up throughout 2019.

This recession differs from others because a single event –the COVID-19 pandemic – allows us to know exactly when and why the recession started. The National Bureau of Economic Research (NBER) has a more detailed definition of recession, characterized by significant diminishing economic activity “lasting more than a few months, visible in industrial production, employment, real income, and wholesale-retail sales.” The NBER officially declared the United States in a recession starting in February 2020, which was the month in which the economy peaked prior to downturn. How long the recession will last, or whether it has already ended, and how severe its impact will be on annual GDP are of utmost importance in forecasting the demand for Utah manufacturers products. The basic question manufacturers and others are concerned about is how deep of an economic hole do we need to climb out of and how long will it take.

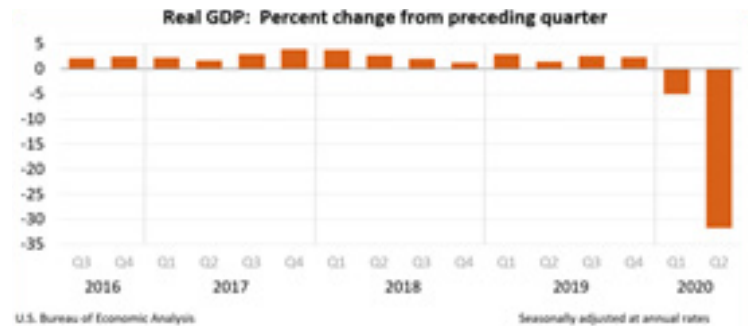


Figure 12 Real GDP Change from Previous Quarter Source: National Bureau of Economic Research (NBER)

A depression is an extended recession or serious decline in the economy that lasts for years. For a depression to be in effect, unemployment rates need to rise above 20% and there needs to be a significant decline in GDP, among other factors. The threat of an economic depression resulting from the COVID-19 pandemic has not fully abated, although most signs indicate depression is not imminent.

Since 1854, the United States has experienced 33 recessions and only one depression, in 1929. During the Great Depression, unemployment rose to 25% and GDP fell by 30%. It was the most unprecedented economic collapse in modern U.S. history. By way of comparison, the Great Global Financial Recession of 2008, lasted about a-year-and-a-half, and was the worst recession since the Great Depression. The Great Recession officially lasted from December 2007 to June 2009, with unemployment peaking at 10.6%.

The terms and models associated with the pandemic are constantly evolving, especially as new information on health, vaccine research, employment, consumer spending and other issues become available every day. Terms such as recovery, reset, and rebound are prominent in several pandemic-related economic analyses, often with overlapping interpretations. We have incorporated several elements from various studies to develop the phases for this forecast. Moreover, we have aligned these phases with the concepts of Recovery and Revitalization as contained in the aforementioned Utah Leads Together plan.

Consequently, this forecast identifies four economic phases stemming from the pandemic:

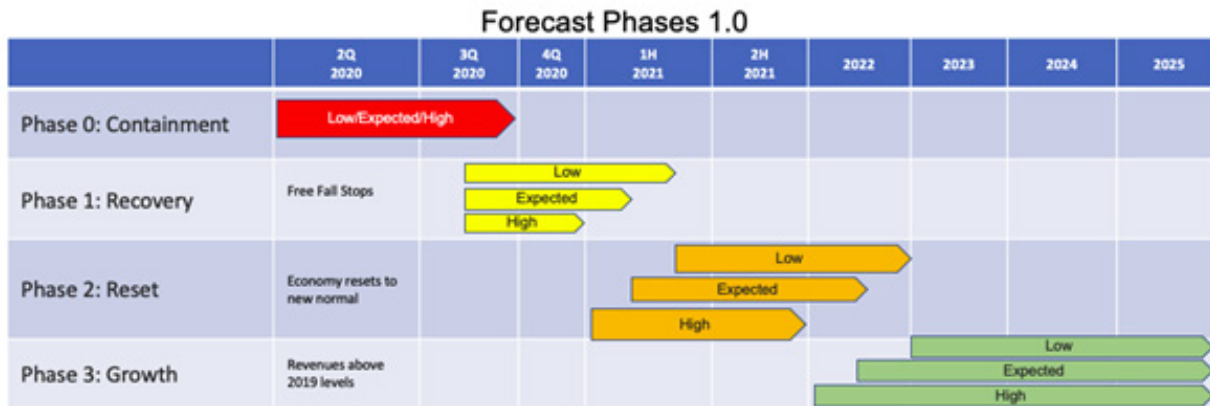


Figure 13 Forecast Phases

These phases are related to near- and medium-term future developments.

Phase 0: Containment Urgent and Stabilization

An initial part of Phase 0, containment, as defined by Professor Joshua Ganz of the University of Toronto, has already been experienced. It consists of identifying the problem (the virus itself), its nature and the immediate actions, such as lockdowns and the promulgation of new hygiene measures, necessary to counter its spread. The majority of the economy was forcibly shutdown, without a direct link to normal patterns of supply and demand. COVID-19 entered the United States early in 2020, leading to economic shutdown in Utah starting March 16, 2020. In the Urgent Phase defined by Utah Leads Together, Utah aggressively addressed the nature of COVID-19 and started wide-spread testing and stay-at-home initiatives. As Utah entered Stabilization in May, state and federal support programs were implemented to help businesses sustain operations until the economy was revitalized and entered recovery.

Phase 1: Recovery

From an economic perspective, Phase 1: Recovery is marked by a stop in the free fall and consistent positive metrics, not just in GDP growth. As noted earlier, the Utah Leads Together Recovery phase is related to job gains. Expanding on that view, this forecast considers the Recovery phase to encompass gains in GDP. As this relates to the pandemic in particular, the ability to realize such gains is likely to be tied to innovation driven by the challenges of COVID-19. This stems both from new procedures that better meet the new environment and from new products and services (vaccines, tests, treatments) that combat the virus. While it is quite possible that isolated hotspots may continue to emerge, Phase 1: Recovery is considered a period that is no longer characterized by widespread extraordinary measures. However, there are significant disruptions to the supply chain, which impacts production.

Phase 1: Recovery acknowledges that economic resources were severely limited in the containment phase as shifts were made to address immediate needs – think of Utah’s ski manufacturer, DPS Skis, changing production lines to manufacture personal protective equipment (PPE). In Phase 1: Recovery, an assessment can be made of the continuing need for that reallocation of resources. The economy has recovered from the free fall of Phase 0 and is continuing to recover to meet new needs while moving away from areas where need is no longer immediate – a demand shift, though the shift may be temporary.

For our purposes, Phase 1: Recovery is the period in which the economy is resuming activity and beginning to reopen, but lacking a clear, continuous, upward trajectory. The size and economic diversity of the United States contributes to some challenges. For example, a sudden rise in cases in one state or region may lead to renewed lockdowns. Consequently, in a country as diverse as the United States, Phase 1: Recovery, may be more chaotic for a state almost exclusively reliant on tourism, such as Hawaii, and more stable for an economically varied state such as Utah. In any case, whether a state or particular industry is on a more even footing than another, the fact that the virus's spread is somewhat understood, and testing regimes are in place mean that as the fourth quarter commences, Phase 1: Recovery is underway. It is expected to last through June 2021.

Phase 2: Reset

In Phase 2: Reset, a testing economy takes hold and safe workplace programs are implemented. Society tests widely to expand its production possibilities. By conducting a large number of tests, companies can more easily facilitate the isolation of workers who are infected, leaving others safe to return to manufacturing lines and other jobs.

The consistent positive economic figures, though not returning to pre-COVID levels, should engender the much-anticipated "new normal." For economists, this is a situation where supply and demand have re-established identifiable, consistent patterns. Phase 2: Reset is projected to commence in third quarter 2021 and is expected to last through second quarter 2023. The positive results in this phase will still not be as high as those immediately prior to COVID-19. Supply chains have adjusted and are more reliable for production.

Phase 3: Growth

In Phase 3: Growth, the virus will have been mostly addressed (via vaccine, possible long-term immunity, etc.) and management of it well-incorporated into the public health system, akin to management of the flu virus. Lingering fears and caution related to the virus that may have impeded investment should be alleviated. Moreover, knowledge and assessment of the crisis will lead to new ways of managing future threats that will in turn drive innovation and investment across industries. Growth in GDP and other economic metrics will begin to surpass pre-pandemic levels. Phase 3: Growth is expected to commence in Third Quarter 2023.

Utah's Manufacturing Industry

The Bureau of Labor Statistics (BLS) defines manufacturing as an industry whose establishments are "engaged in the mechanical, physical, or chemical transition of materials, substances, or components into new products." While manufacturing typically may bring to mind images of assembly lines or large workshops, the definition includes a wide range of economic activity encompassing areas as broad as petroleum refining and cheese-making. The 3,206 manufacturing firms in Utah in 2017 were distributed among the following sectors based on output :



Figure 14 Top Ten Utah Manufacturing Sectors

The report from the Kem C. Gardner Policy Institute, commissioned by the Governor’s Office of Economic Development, estimated that in 2020 manufacturing accounted for 11 percent of Utah’s GDP with output of \$19.6 billion GDP. The 143,461 jobs in the sector make it the state’s fifth-largest industry. This forecast is consistent with the Kem C. Gardner Institute’s classification of the manufacturing industry by the North American Industry Classification System (NAICS). NAICS uses a six-digit coding system to identify economic sectors and ultimately, at the six-digit level, the industry. Data compiled by the National Institute of Standards and Technology (NIST) shows that Utah manufacturers produced in 327 different NAICS 6-digit categories in 2019.

Sales figures for Utah manufactured products in 2019 totaled \$56.2 billion. The top ten industry groups account for just under 60 percent of all Utah manufacturing activity, while the top 20 account for over three quarters.

Utah Manufacturing Industry Group Sales 2019

Rank	NAICS-4	Description	2019 Total Sales	Share	Cumulative
1	3241	Petroleum & Coal Products Mfg	\$10,839,801,808	19.3%	19.3%
2	3391	Medical Equipment & Supplies Mfg	\$2,955,738,504	5.3%	24.5%
3	3345	Navigational, Measuring, Electromedical & Control Instruments Mfg	\$2,838,160,345	5.0%	29.6%
4	3364	Aerospace Products & Parts Mfg	\$2,743,755,405	4.9%	34.5%
5	3254	Pharmaceutical & Medicine Mfg	\$2,517,114,861	4.5%	38.9%
6	3363	Motor Vehicle Parts Mfg	\$2,408,393,179	4.3%	43.2%
7	3115	Dairy Product Mfg	\$2,349,120,294	4.2%	47.4%
8	3116	Animal Slaughtering & Processing	\$1,971,190,183	3.5%	50.9%
9	3323	Architectural & Structural Metals Mfg	\$1,825,688,282	3.2%	54.2%
10	3314	Nonferrous & Metal (ex. Aluminum) Production & Processing	\$1,817,252,294	3.2%	57.4%
11	3399	Other Miscellaneous Mfg	\$1,751,337,888	3.1%	60.5%
12	3261	Plastics Product Mfg	\$1,689,277,097	3.0%	63.5%
13	3222	Converted Paper Product Mfg	\$1,061,524,471	1.9%	65.4%
14	3111	Animal Food Mfg	\$1,038,173,285	1.8%	67.3%
15	3339	Other General Purpose Machinery Mfg	\$956,825,538	1.7%	69.0%
16	3311	Iron & Steel Mills & Ferroalloy Mfg	\$840,126,533	1.5%	70.5%
17	3118	Bakeries & Tortilla Mfg	\$839,524,929	1.5%	72.0%
18	3344	Semiconductor & Other Electronic Component Mfg	\$830,401,692	1.5%	73.4%
19	3119	Other Food Mfg	\$824,575,138	1.5%	74.9%
20	3273	Cement & Concrete Product Mfg	\$795,540,918	1.4%	76.3%
Other			\$13,313,532,164	23.7%	100.0%
Grand Total			\$56,217,054,807	100.0%	

Source: NIST Manufacturing Extension Partnership

Figure 15 Utah Manufacturing Subsector Sales 2019

The diversity of Utah's manufacturing, however, is best understood at the six-digit (or national industry) level. The top 10 industry products account for only one-third of all Utah manufactured products, and the top 20, just over half.

Utah Manufacturing Products by Sales 2019

Rank	NWICS-6	Description	2019 Total Sales	Share	Cumulative
1	324110	Petroleum Refineries	\$10,513,905,811	18.7%	18.7%
2	338390	Other Motor Vehicle Parts Manufacturing	\$2,306,354,151	4.1%	22.8%
3	339112	Surgical and Medical Instrument Manufacturing	\$2,162,833,094	3.8%	26.7%
4	325412	Pharmaceutical Preparation Manufacturing	\$2,010,266,511	3.6%	30.2%
5	311513	Cheese Manufacturing	\$1,813,232,917	2.9%	33.1%
6	331410	Nonferrous Metal (except Aluminum) Smelting and Refining	\$1,353,027,471	2.4%	35.5%
7	334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	\$1,289,564,458	2.3%	37.8%
8	338415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	\$1,035,075,651	1.8%	39.6%
9	339920	Sporting and Athletic Goods Manufacturing	\$996,445,437	1.8%	41.4%
10	336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	\$934,551,758	1.7%	43.1%
11	311611	Animal (except Poultry) Slaughtering	\$928,957,101	1.7%	44.7%
12	331110	Iron and Steel Mills and Ferroalloy Manufacturing	\$840,126,533	1.5%	46.2%
13	332312	Fabricated Structural Metal Manufacturing	\$838,463,971	1.5%	47.7%
14	334517	Irradiation Apparatus Manufacturing	\$770,575,783	1.4%	49.1%
15	311612	Meat Processed from Carcasses	\$713,759,774	1.3%	50.4%
16	326199	All Other Plastics Product Manufacturing	\$652,864,968	1.2%	51.5%
17	335991	Carbon and Graphite Product Manufacturing	\$635,896,324	1.1%	52.6%
18	323111	Commercial Printing (except Screen and Books)	\$630,426,750	1.1%	53.8%
19	325180	Other Basic Inorganic Chemical Manufacturing	\$585,231,000	1.0%	54.8%
20	334413	Semiconductor and Related Device Manufacturing	\$562,092,623	1.0%	55.8%

Source: NIST Manufacturing Extension Partnership

Figure 16 Utah Manufacturing Products by Sales 2019

Demand Forecast for Utah Manufacturing Industry

Precisely because this is a demand forecast, Utah's manufacturing industry sales, as shown in the previous section, is the metric we are estimating. The criticality of the short-term outlook necessitated by the COVID-19 pandemic means that we are looking specifically at the behavior of the marketplace based on financial strength. The pandemic's effect on the supply-chain and on the availability of raw and intermediate materials influences manufacturers' ability to produce the goods the market demands. Indeed, some manufacturers may be temporarily unable to meet potential demand, while others have been forced to shut down due to the drop-in end-user demand. Nevertheless, the rapidly changing nature and apparent improvement of supply chain disruptions prevents this factor from being incorporated into our forecast at a detailed level. The supply-side shock which occurred in Phase 0 at the beginning of the pandemic is believed to have transformed into a demand shock. Because of this, overall supply-chain disruptions, insofar as they reflect consumer behavior, are understood to be incorporated in forecasts of GDP and other metrics that are the basis of the model. Therefore, to provide a broad-based and immediately useful outlook to manufacturers, demand is considered simply to reflect customers' desire for the goods they produce.

GDP Scenarios

The massive 31.7% decline in second quarter GDP is unlikely to be repeated. As discussed earlier, the drop reflected a near-halt to the economy in April of 2020. Consequently, economists anticipate a strong rebound in third and fourth quarters, with GDP rebounding 32.9% in the former and gaining another 1.6% in the latter. This contributes to our expected case further discussed below. Utah's recovery is likely to follow a similar pattern and achieve full recovery in pre-COVID GDP levels for the metro areas in 2021.

With relation to GDP in our forecast, we have three cases: low, expected, and high. This section describes our assumptions for each of the scenarios.

Forecast Scenarios

Scenario	Description	GDP Assumptions					
		2020	2021	2022	2023	2024	2025
Low	Significant 2nd wave, no vaccine widely available, infection rates continue to increase	-5%	1.8%	1.7%	1.7%	1.9%	1.9%
Expected	Vaccine found, but not widely available, no 2nd wave and infection rates stabilize, society learns to live/work with virus	-3.8%	3.2%	3.2%	1.5%	1.6%	1.7%
High	Vaccine is widely available, no 2nd wave, infection rates decline, society learns to live/work with virus	-5.6%	5.7%	5.5%	4.4%	3.8%	3.6%

Figure 17 Forecast Scenarios

Low Forecast Case

For the low case, we assume there is a significant second wave requiring continued lockdowns in several parts of the country, though not as significant as the initial wave given greater knowledge and response capability. We also assume a vaccine is not widely available and infection rates continue to climb. Pandemic modeling by Oxford University has shown that a worst-case annual GDP hit of -5% could be expected assuming no change in how society generally consumes. This is consistent with S&P Global's prediction for US GDP as of July 1, when it was less clear what level of economic rebound was underway. Nevertheless, the feared second wave that winter may bring would set the stage for muted GDP growth in 2021 and the longer-term outlook reflects economic uncertainty in the absence of a wide-spread, global control of the virus. Thus, the low case assumes 2020 annual GDP of -5%, 1.8% for 2021, 1.7% for 2022 and 2023 and 1.9% for the remainder of the forecast period.

Expected Forecast Case

The expected case represents a fifty/fifty chance of results at a higher or lower level. The expected case assumes a vaccine is not widely available, but infection rates drop, and measures to create a safe workplace are established and society has learned to work within CDC guidelines. Hotspots may occur but are generally isolated. The expected case assumes a strong rebound in the third quarter of 2020, but a slowing in the fourth quarter as the effects of deepened unemployment (with expiring benefits) taking hold. The expected case GDP assumptions are based on estimates from the Conference Board for the near term and estimates from the Organization for Economic Cooperation and Development (OECD) of real GDP growth in the later years of the forecast. Annual GDP is projected to decline 3.8% for 2020 but to rebound by 3.2% in 2021 and 2022. Growth slows to 1.5%, 1.6% and 1.7% in each of the years between 2023 and 2025.

High Forecast Case

The high forecast assumes a vaccine is widely distributed by third quarter 2021, there is no second wave, infection rates decline, safe workplaces are established, and society has learned to work within CDC guidelines. Hotspots may occur but are generally isolated. The economy continues the rebound from the summer of 2020, but at a slower more evenly distributed pace. Based on projections compiled by Euromonitor, the high case is notable in the sharp decline projected for 2020, but has a stronger rebound than the other scenarios. Annual GDP growth for 2020 is projected to be off 5.6%, but grow 5.7% in 2021, 5.5% in 2022, 4.4% in 2023, 3.8% in 2024 and 3.6% in 2025.

Utah Manufacturers Demand Forecast

The forecast scenarios differ from, but are not entirely unrelated to, the economic phases of the pandemic discussed earlier. For example, the low scenario, in which the economy is slowed may coincide with a longer period of reset than anticipated. Likewise, the high (or optimistic) case, would mean that growth over pre-pandemic GDP levels returns quickly.

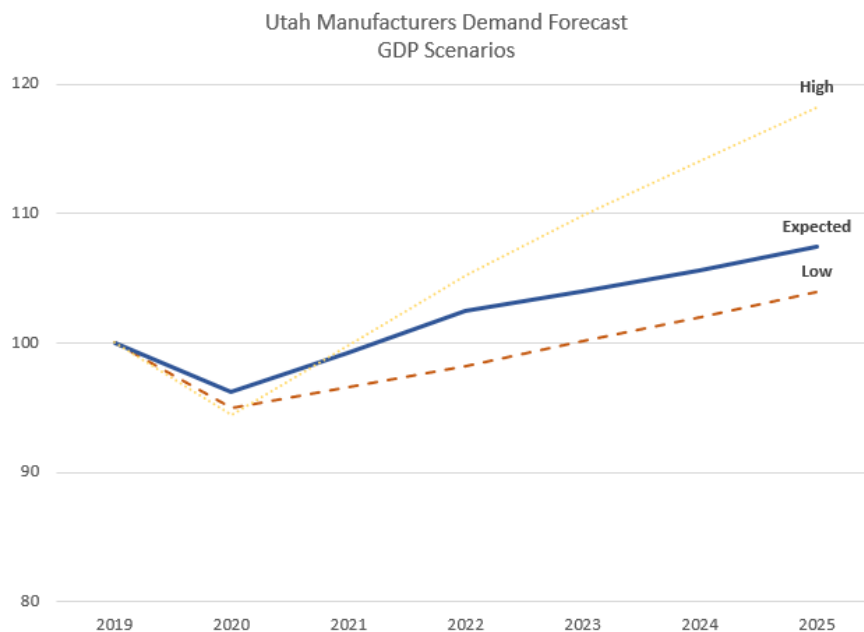


Figure 18 Utah Manufacturers Demand Forecast GDP Forecasts

Utah Economic Activity

An important element in the case for optimism and against the low scenario for Utah manufacturers is the state's economic position. The Wall Street Journal recently ranked Utah as having the best economy in the United States. Utah has the highest five-year annualized employment growth rate and the second highest five-year GDP growth rate. While that data only incorporates the first quarter of 2020 and thus does not reflect much of the pandemic, the measures are "indicative of the overall economic health and financial security of state residents." Yet, most impressively, one pandemic-related figure does stand out. For June 2020 – three months into the pandemic – the state unemployment rate was just 5.1%, the second lowest in the nation.

Further benefitting Utah is the fact that the next top three states are in the west: Idaho, Washington, and Colorado. Also, among the top 10 are Arizona and Oregon. These rankings underscore Utah's strong economic position because regional interdependence is an important component of economic activity for the state. Utah and its neighbors have the financial underpinnings to help sustain Utah manufacturing while economic activity (and demand) in other parts of the country may still be recovering.

Utah's principal air transport gateway, Salt Lake City International Airport (SLC) has one of the most modern facilities in the country and facility improvements totaling \$4.1 billion through 2024, which mean that Utah manufacturers have a highly efficient transport gateway to facilitate critical shipping and to enhance market reach domestically and globally. The new construction streamlines operations by replacing the previous five concourses with two linear concourses which will be able to accommodate 26 million passengers annually. The first of the new concourses opened on September 15 of this year with 25 gates. This is only the first of four phases of construction which see improved airport access and parking. This construction helps buoy local employment through the Reset and Recovery phase. SLC retains its status as a hub for Delta Air Lines which is generally considered to have the strongest balance sheet of the three major network carriers.

Statistics provided by the airport show that both enplaned and deplaned cargo has remained strong throughout 2020. In fact, August cargo figures were 2.7% higher in 2020 than in the same month of 2019. This suggests that SLC has been able to adapt quickly to market needs and to maintain good supply chain connections.

Passenger demand, as in the United States is down sharply. Whereas SLC's total enplaned and deplaned passengers were over 2 million in January and February of this year, they fell to just over 176,000 by April. For the year through August, total passengers are down 53.4% versus last year. Though severe, the drop is less severe than many other airports throughout the country because it is a major hub in an area of the country that depends heavily on air travel. Furthermore, SLC has seen passenger numbers return strongly as service has returned and destinations have opened for travel. Total passengers jumped from 582,000 in June to just over 1 million in August. This suggests that as SLC continues to restore service, combined with its new terminal adding convenience for local and connecting passengers, SLC will remain a strong economic engine for Utahns and a resource for the state's manufacturers.

Economic Predictors

The forecast team also examined other key economic variables discussed below. Each of these variables provide an understanding of the general economic conditions that lie behind the GDP numbers. Additionally, for Utah manufacturers, some of these metrics may be more relevant predictors of demand than the GDP forecast and form part of the industry-specific outlook. The interactive forecast database to be presented in Using Market Demand to Manage Production Levels COVID-19 Market Demand Analysis and Forecast 2.0 will allow Utah manufacturers to incorporate these metrics (as they relate to industry-level sales) into a customized forecast for their product lines.

Employment

Economists differ on how to define full employment. Utah Leads Together targeted a statewide unemployment rate of 4.0% -5.0% by the end of 2020, falling to between 3.0% and 4.0% by mid-2021. The state's unemployment rate grew to 9.7% in April 2020.

Job growth constitutes another key measure of economic recovery. As the pandemic's impacts spread, Utah's employment growth rate dropped from a 2.5% year-over increase in March 2020 to a 7.1% year-over-year decrease in April 2020. Utah Leads Together targeted a statewide year-over-year job growth rate of between 1.5 and 2.0% by the end of 2020 for economic recovery and between 2.5 and 3.5% by mid-2021 as economic revitalization occurs.

The United States lost more than 1.3 million jobs in March and nearly 21 million in April. These sharp job losses were followed by a gain of 2.5 million jobs in May. This volatility can be attributed to the nature of the public health response and employers anticipating some degree of recovery in the near-term. Nationally, 73% of those unemployed reported themselves as temporarily unemployed. Jobless claims in the state show a similar percentage of workers temporarily laid off. Furthermore, it should be noted that job losses in Utah were less severe than in much of the United States, with Utah's largest metros faring comparatively well to major metros in the country in terms of year-over-year jobs lost. Utah's continued unemployment claims as of mid-September are among the lowest in the nation, although these percentages vary by county within the state. Continued unemployment claims continue to gradually decline as Utahns return to work.

Conference Board Economic Outlook

While there are several sources for economic data, this study chose the Conference Board, an independent economics think-tank that provides economic outlook for businesses and the community at large. Their Economic Outlook looks at five major economic measures: Real GDP (which we have previously discussed), Real Consumer Spending, Residential Investment, Real Capital Spending, and Exports. The Conference Board's base case for each measure appears in Figure 16. The base case is defined as the situation in which there is a fifty percent chance of results being higher than the forecast numbers and a fifty percent chance of them being lower. Detailed discussion of each, including its reflection of the pandemic's effect on economic activity.

THE CONFERENCE BOARD BASE CASE ECONOMIC OUTLOOK, 2019-2020-2021

Percentage Change, Seasonally Adjusted Annual Rates

	2020				2021		2019	2020	2021
	1Q*	2Q*	3Q	4Q	First Half	Second Half	ANNUAL	ANNUAL	ANNUAL
Real GDP	-5	-31.7	32.9	1.3	1.8	6.4	2.2	-3.8	3.2
Real Consumer Spending	-6.9	-34.1	33.2	2.4	2.7	6.8	2.4	-4.8	3.7
Residential Investment	19	-37.9	33	10	5.5	4	-1.7	1.2	5.5
Real Capital Spending	-6.7	-26	6.8	4.7	2.6	5.6	2.9	-5.9	1.9
Exports	-9.5	-63.2	19	5	5	5	-0.1	-16.3	0

* Actual Data

Source: The Conference Board, Sep. 9, 2020

Figure 19 The Conference Board Base Case Economic Outlook

Real Consumer Spending

Real consumer spending is the value of goods and services purchased by residents of the United States. It is a useful economic metric because it is a direct reflection of consumers' consumption (and, in essence, willingness to consume) and therefore reflects perceived economic health. This spending, recorded as Personal Consumption Expenditures (PCE) by the Bureau of Economic Analysis (BEA), fell nationwide by 6.7% in March and 12.9% in April, followed by two strong months of growth as economic stimulus and unemployment payments entered consumers' wallets.

Real Consumer Spending (Personal Consumption Expenditures)						
Percent Change Over Previous Month 2020						
Jan. ^r	Feb. ^r	March ^r	April ^r	May ^r	June ^r	July ^p
0.6	0.0	-6.7	-12.9	8.6	6.2	1.9

Source: Bureau of Economic Analysis

Figure 20 Real Consumer Spending

Notably, there was a major decline in durable goods consumption in March (down 12.9%), while that for nondurables recorded a relatively high 3.8% increase as consumers stocked up on household goods, though nondurables then fell 14 percent in April. Durables rebounded heavily in May with a 29.3 percent increase over April.

The BEA's quarterly statistics, which are used in the Conference Board's Economic Outlook, allow a deeper examination of the changes in expenditures at a more detailed level by product and service. In the nondurable goods category, the greatest declines in spending occurred with clothing & footwear and in gasoline & energy consumption. These are relatively unsurprising as consumers turned away from discretionary spending (affecting clothing purchases) while energy spending dropped as commuters stayed at home and many factories significantly curtailed production.

Percent Change in Real Personal Consumption		
Nondurable Goods		
	1Q20	2Q20
Nondurable goods	7.1	-14.9
Food and beverages purchased for off-premises consumption	31.0	-6.0
Clothing and footwear	-34.6	-48.2
Gasoline and other energy goods	-17.1	-54.7
Other nondurable goods	12.2	0.0

Source: Bureau of Economic Analysis, seasonally adjusted

Figure 21 Percent Change in Real Personal Consumption, Nondurable Goods

Among services, it was also not surprising to see strong decreases in categories related to travel and entertainment, with spending among those down 80% to just over 93% for the second quarter. There was also, however, a 54.6% decrease in health services which may seem counterintuitive given the attention to the virus. However, in the initial stages of the pandemic, all non-necessary doctor visits were discouraged, and elective surgeries canceled. In many instances, dentists, plastic surgeons, and other specialists temporarily shut their offices. These actions contributed to the sharp decline in healthcare spending.

Percent Change in Real Personal Consumption		
Services		
	1Q20	2Q20
Household consumption expenditures (for services)	-13.3	-46.4
Housing and utilities	-0.3	4.4
Health care	-16.3	-54.6
Transportation services	-26.4	-80.9
Recreation services	-33.4	-93.3
Food services and accommodations	-31.3	-80.6
Financial services and insurance	-2.0	0.4
Other services	-12.2	-58.4
Source: Bureau of Economic Analysis, seasonally adjusted		

Figure 22 Percent Change in Real Personal Consumption, Nondurable Goods

Residential Investment

Residential investment is the economic activity generated by the purchase of private residential structures and residential equipment that is owned by landlords and rented to tenants. This includes new construction as well as the sale and improvement of new structures. It can serve as an indicator for future consumer spending on durable goods and is considered a barometer of general confidence in the economy.

First quarter 2020 residential investment was up 19.0% over the previous quarter but declined 37.9% in the second quarter as the pandemic took hold. Expected improvements in 2020 third and fourth quarter indicate that residential investment should show a gain of 1.2% for the year.

Real Capital Spending

Essentially covering all that are additions to fixed assets as well as net changes in inventories. As such, it covers a broad spectrum of spending that is a wider gauge of general economic confidence than residential investment. The first quarter decline of 6.7% was followed by a 26.0% decline in the second quarter. Despite forecast improvements in the latter half of the year, it is expected to decline 5.9% for the year.

Exports

Exports have shown the most drastic declines of any of the major metrics. They fell 9.5% in the first quarter as other parts of the world (notably China and Europe) initiated shutdowns in that quarter, lessening overall demand for goods. In the second quarter, exports plummeted a further 63.2 % as supply-chains became severely limited, both by air and sea. The improvement in supply channels first seen in June is believed to have held through the third quarter which will enable exports to improve by 19% for the quarter, but will be down sharply, 16.9% for the year.

Exports for Utah manufacturers' goods were valued at \$16.5 billion for 2019, which was 94.8% of the state's total exports that year. Export trade is balanced across a number of trading partners, as the top five export markets accounted for only 11.9% of the state's total manufactured goods exports. This bodes well for the state should global recovery be uneven.

Projected Utah Manufacturing Sales

Applying the GDP growth rates to Utah manufactured products, sales for the forecast period would be as follows:

Projected Sales - Utah Manufacturers (billions, US)

Scenario	2019	2020	2021	2022	2023	2024	2025
Low	\$ 56.2	\$ 53.4	\$ 54.3	\$ 55.2	\$ 56.3	\$ 57.3	\$ 58.4
Expected	\$ 56.2	\$ 54.1	\$ 55.8	\$ 57.6	\$ 58.4	\$ 59.4	\$ 60.4
High	\$ 56.2	\$ 53.1	\$ 56.1	\$ 59.2	\$ 61.8	\$ 64.1	\$ 66.4

Figure 23 Projected Utah Manufacturers' Sales 2020-2024

A return to pre-COVID-19 sales comes remarkably close to happening as early as 2021 in the high case and by 2022 in the expected, but not until 2023 in the low case.

Industry Specific Effects

The forecasters have attempted to consider some of the discreet trends specific to each manufacturing industry to develop a more nuanced view of the likely aggregate effect on Utah manufacturing sales as a whole. In some cases, these industry specific effects place greater weight on the different Conference Board predictors and incorporate sales forecasts from Euromonitor. Euromonitor tracks sales forecasts in most industries for various world regions. The firm's forecasts are continuously updated and have incorporated the effects of the COVID-19 pandemic.

Industry Level Predictions

For Utah's top manufacturing products, the forecasters have examined Euromonitor's forecasts of sales at the manufacturing sales point. All the top product lines are expected to record a decrease in sales for 2020, at the national level, with one exception: Pharmaceutical & Medical Manufacturing. On a positive note, all the top industries are expected to have positive year-over-year results in 2021. Apart from petroleum manufacturing, the top 10 manufacturing industries are forecast to return to pre-pandemic levels in 2022; petroleum manufacturing is estimated to do so in 2023.

Manufacturer Sales Point, Forecast Sales Percent Change by NAICS-4 Digit Category for USA Production Ranked by Top Manufacturer Products in Utah									
Utah Rank	NAICS-4	Description	Euromonitor Equivalent	2020	2021	2022	2023	2024	2025
1	3241 Petroleum & Coal Products Mfg		Coke Oven products and Refined Petroleum products	-21.4%	10.3%	13.3%	8.4%	6.8%	5.8%
2	3391 Medical Equip & Supplies Mfg		Medical & Surgical Equipment	-1.1%	4.7%	3.7%	3.0%	2.7%	3.0%
3	3345 Navigational, Measuring, Electromedical & Control Instruments Mfg		Appliances for Measuring, Navigating and Testing	-7.4%	5.1%	4.1%	2.8%	2.2%	2.5%
4	3364 Aerospace Product & Parts Mfg		Aircraft & Spacecraft	-6.2%	4.4%	3.7%	2.8%	2.3%	2.5%
5	3254 Pharmaceutical & Medicine Mfg		Pharmaceuticals	0.5%	7.5%	5.5%	4.8%	4.3%	5.1%
6	3363 Motor Vehicle Parts Mfg		Parts and Accessories (Of Motor Vehicles) (Use Only)	-8.4%	8.1%	6.8%	5.2%	4.5%	4.4%
7	3115 Dairy Product Mfg		Dairy Products	-5.6%	4.8%	3.8%	2.7%	2.1%	2.0%
8	3116 Animal Slaughtering & Processing		Meat & Meat Products	-1.4%	3.4%	2.8%	2.2%	1.9%	1.8%
9	3323 Architectural & Structural Metals		Structural Metals	-4.7%	7.8%	5.5%	3.3%	2.5%	2.5%
10	3334 Nonferrous Metal (except Aluminum) Production & Processing		Basic Precious and Non-ferrous Metals(excl Aluminum)	-14.4%	12.0%	7.5%	2.6%	0.8%	0.7%

Source: Euromonitor

Figure 24 Projected Utah Manufacturers' Sales 2020-2024

Our GDP forecasts, as they reflect the whole economy, are useful in understanding the broad outlook for Utah’s manufacturers. Comparison of that broad base with the Euromonitor Sales forecasts at the industry level give a sense of each of Utah industry’s predicted relative strength or weakness within the larger economy. A discussion of each major product category follows with a comparison of Euromonitor Sales forecasts at the industry level against our GDP predictions. In all charts, both GDP and sales are indexed at their 2019 levels.

Petroleum & Coal Products Manufacturing

Petroleum & coal products manufacturing includes firms that transform crude oil and coal into usable products. Oil refining is the largest activity in this group, comprising processes such as cracking and distilling among others. Examples of final products include asphalt coatings and petroleum lubricating oils.

The massive downturn in second quarter energy consumption, recorded by the BEA as a drop of over 54%, contributes to the sharp predicted annual decline. Petroleum refineries were especially hit because many workers stopped commuting and regular individual car trips for shopping and taking children to school dropped almost instantly. This was partially offset by increased use of delivery services for replacement of errands but did not offset general commuting demand. The return of such demand has been spotty, particularly as many school systems have remained closed or opted for more limited in-person schedules. Air travel is recovering at a historically slow rate. Airlines for America, the nation’s trade association for air carriers, does not predict a return to pre-COVID-19 demand until 2024.

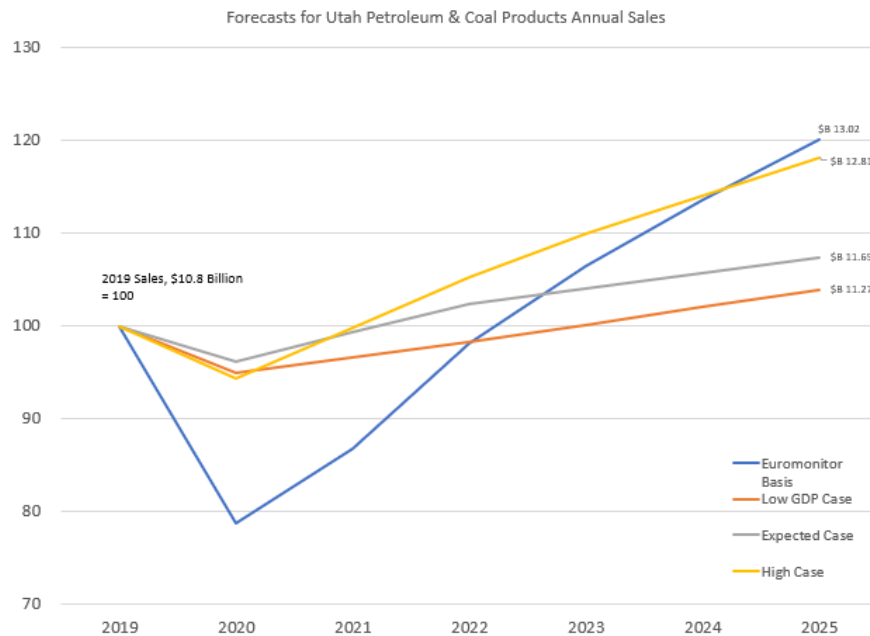


Figure 25 Petroleum & Coal Products Forecast Sales

Euromonitor’s forecast for the Petroleum and Coal Products is significantly downbeat for 2020 compared to the GDP forecasts, but by 2025 outperforms all the GDP forecasts, with predicted sales of \$13.02 billion. Prior to the pandemic, the U.S. Energy Information Agency had already predicted growth in domestic energy consumption to be lower than GDP growth due to growing energy efficiency. Crude oil production, however, was expected to rise in the first half of this decade. A return to these predicted levels of demand depends heavily on the overall recovery of the economy. Nevertheless, demand prior to the pandemic was expected to rise sharply through 2030.

Medical Equipment & Pharmaceuticals

The medical device and equipment industry were estimated to grow 4.1% annually through 2025 according to forecasts prepared in late 2019 and early 2020. A combination of the increasing prevalence of certain medical conditions, awareness of them and technological breakthroughs combined to generate these strong annual numbers. A challenge presented by COVID-19 is the sudden reallocation of resources to fighting the pandemic and a strain on the budgets of most public health systems. Still, medical equipment is predicted to have one of the lowest declines of any of the major Utah manufacturing industries. Euromonitor forecasts a quick and steady recovery for the industry that reaches sales of \$3.46 billion by 2025, just under the \$3.49 billion that would be expected applying the high GDP case.

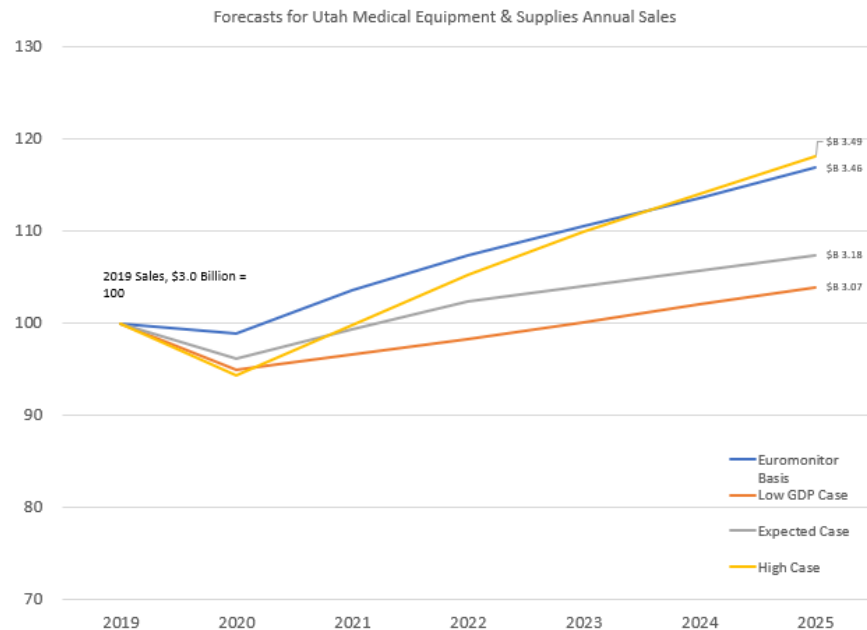


Figure 26 Medical Equipment & Supplies Forecast Sales

Pharmaceutical and medicine manufacturing is the one major Utah industry that is expected to register growth, albeit very modest, for 2020. The industry has had to adjust, particularly in terms of marketing and sales practices that relied on in-person visits to doctors and hospitals. Still, demand for key pharmaceuticals has remained strong and there is evidence there may have been a COVID-related boost in the first quarter. Makers of the flu vaccine may benefit from a strong push – and awareness of the benefits thereof – this year.

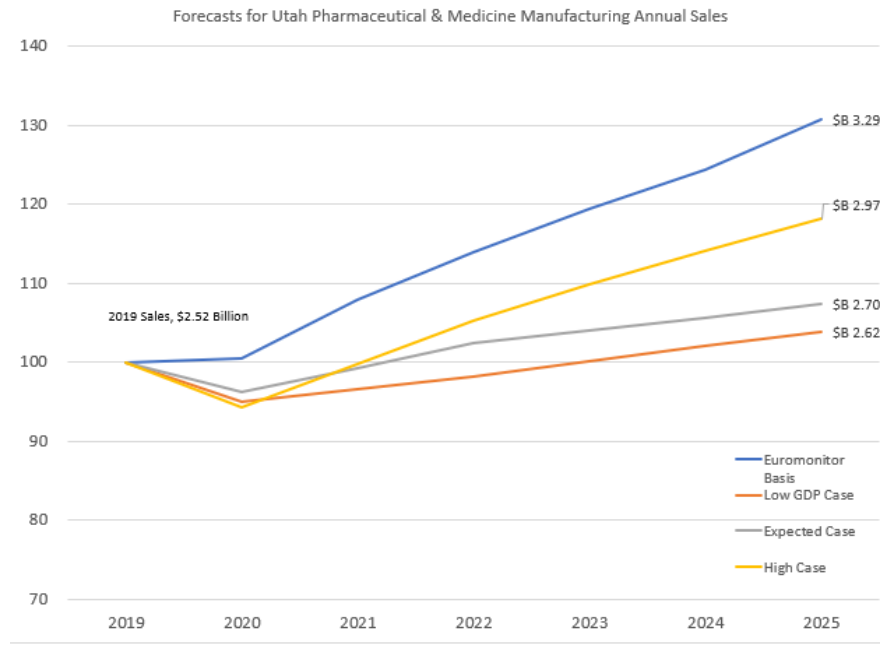


Figure 27 Pharmaceutical & Medicine Manufacturing Forecast Sales

Aerospace Defense

Two industry categories generally covering aerospace and defense manufacturing: 1) Navigation, Measuring, Electromedical & Control Instruments Manufacturing; and 2) Aerospace Products & Parts Manufacturing. These categories are projected to see sales declines of between 6% and 7.5% for the year. One of the key products to which Utah industry contributes is the F-35 manufactured by Lockheed Martin. The company has indicated that supply chain disruptions mean that deliveries have needed to be postponed and these will not fully recover until the end of 2021.

Boeing's recently released 10-year forecast has incorporated the COVID-19 pandemic by reducing 10-year demand for aerospace and defense products from \$8.7 billion to \$8.5 billion.

Deloitte has pointed out that defense contractors are in a relatively safe position with regard to sales over the forecast period because the budgets related to their projects were allocated before the pandemic and national defense remains a priority. Nevertheless, Euromonitor's near-term outlook for the industry reflects some pessimism. For the navigational and other instrument manufacturing industry (which includes guided missiles), Euromonitor projects a sharper percentage drop than any of the GDP scenario percentage drops. This nevertheless returns to pre-COVID levels by 2022 and begins to mirror the expected GDP-based scenario with sales in 2025 of \$3.1 billion.

Commercial aviation is taking a severe beating. Boeing's 2020 Market Outlook has lowered commercial aircraft demand by 11% compared to their 2019 forecast. Passenger volumes for the week ending September 20 were down 68% over the prior year. Corporate travel, which provides a greater share of revenue to carriers than leisure, remains down more than 85%. The industry's trade association does not anticipate a recovery to pre-COVID-19 passenger levels until 2023 or 2024. This depressed situation has a direct effect on aerospace parts manufacturers. A downturn in flying to adjust to lower demand means that aircraft require less maintenance. Not only are existing fleets flying fewer annual hours, but many fleets are being reduced as aircraft enter long-term storage. Still because aerospace manufacturing is dominated by the defense.

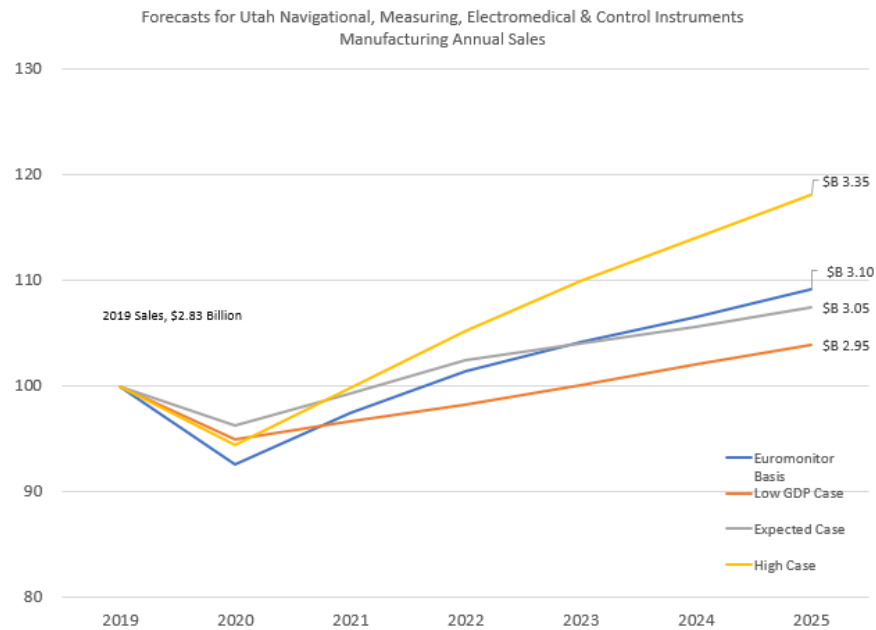


Figure 28 Navigational & Other Instruments Mfg . Forecast Sales

Sector, Euromonitor’s forecasts for navigational and other instruments, with sales in 2025 at \$3.01 billion.



Figure 29 Boeing Passenger Outlook

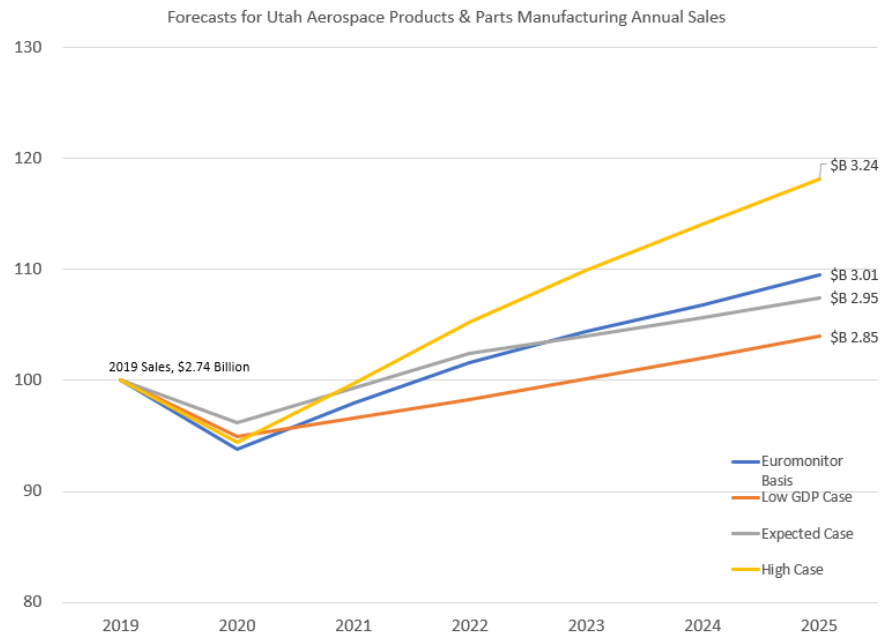


Figure 30 Utah Aerospace Products & Parts Manufacturing Annual Sales

Automotive

For auto parts manufacturers, annual sales are expected to be down 8.4% according to Euromonitor, though the industry has taken a roller-coaster ride. It is the nation's largest manufacturing sector, so has an important role in employment and demand for resources. Despite an initial drop-off in sales as the pandemic took hold, carmakers ramped up production again in June. Rental car companies did take a major hit – notably Hertz which filed for bankruptcy protection. However, precisely because car manufacturing is the nation's biggest manufacturing industry, it is immediately affected by virus surges and lockdowns affecting its workers, thus impeding the ability to produce. The demand side of the equation, while softened, is projected to remain buoyant and Euromonitor's annual sales projections closely follow the high GDP scenario. If those hold, Utah's motor vehicle manufacturers could expect annual sales in 2025 of just over \$2.9 billion.

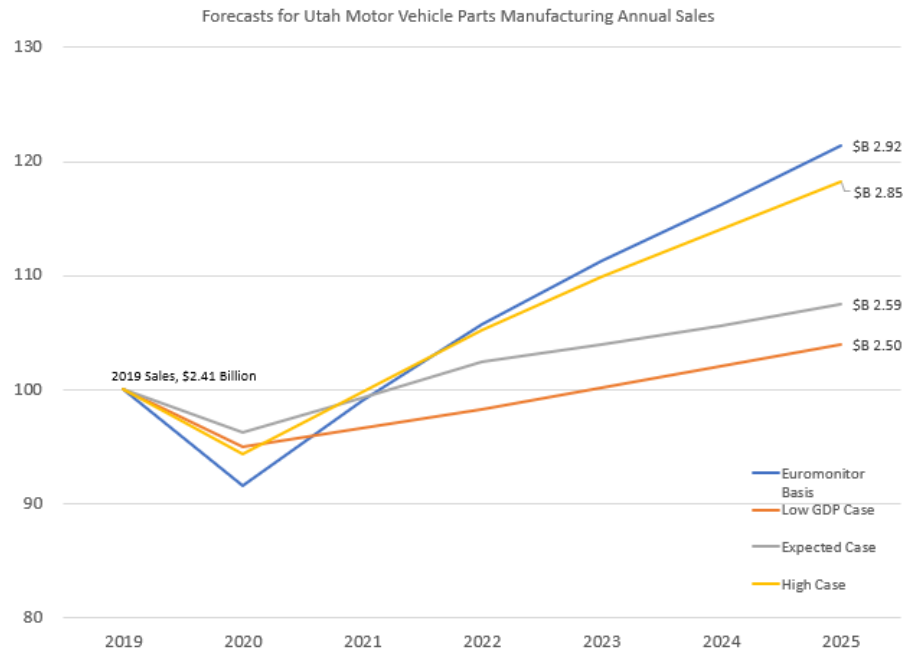


Figure 31 Motor Vehicle Parts Mfg. Forecast Sales

Food Products

Food and beverage recorded second quarter declines both for consumption in-home and at restaurants, though the former fell only 6%. Food services are combined with accommodations in measures of personal consumption, so while the 80.4% decline in that metric is stark, that has more to do with a lack of travel than the decline – albeit significant – in restaurant demand. Census Bureau figures show that restaurant demand in August was about 16.5% below February numbers.

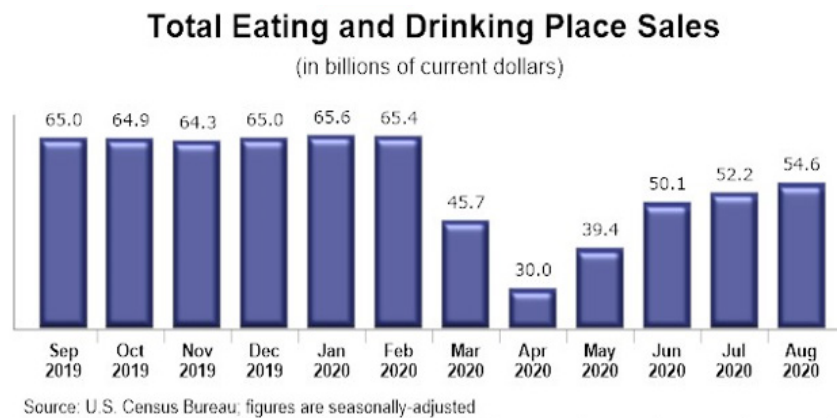


Figure 32 Total Eating and Drinking Place Sales

Food demand is generally thought to be steady, but to have shifted from restaurants to home precisely because that is where people now spend most of their time. To the extent food manufacturers were distributing primarily to food service companies and restaurants, the greater adjustment they may face in achieving sales growth.

High food prices that were largely reported in the beginning of the third quarter reflected supply chain disruptions. Until distribution networks adjust, those prices could eventually affect demand. According to the U.S. Department of Agriculture (USDA), food prices (based on the consumer price index) were 3.4% higher in July 2020 than in July 2019 for restaurant purchases and 4.6% higher for grocery and supermarket purchases. Dairy product sales are forecast to fall more than meat and poultry in 2020, but then both will recover at approximately the same rates based on Euromonitor's projections.

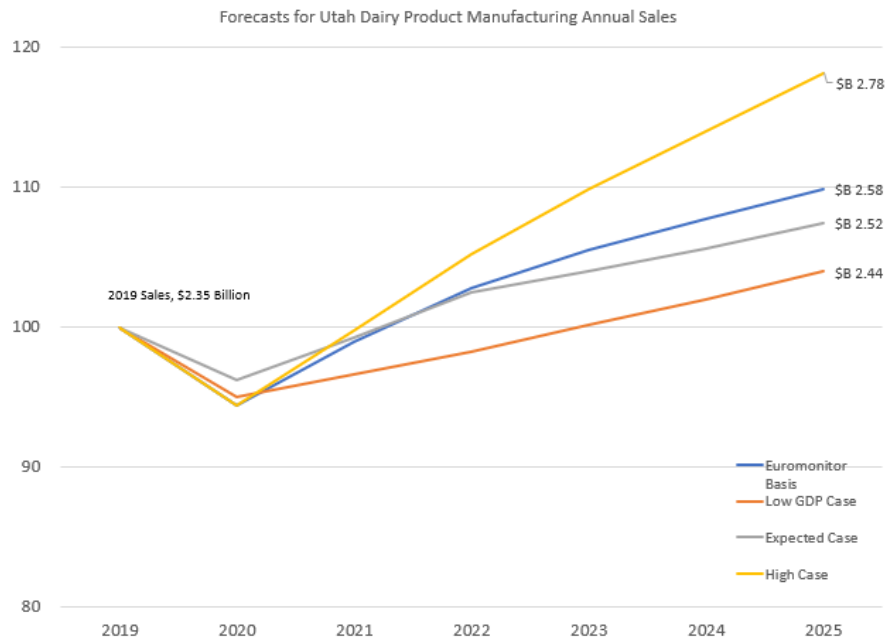


Figure 33 Dairy Product Manufacturing Forecast Sales

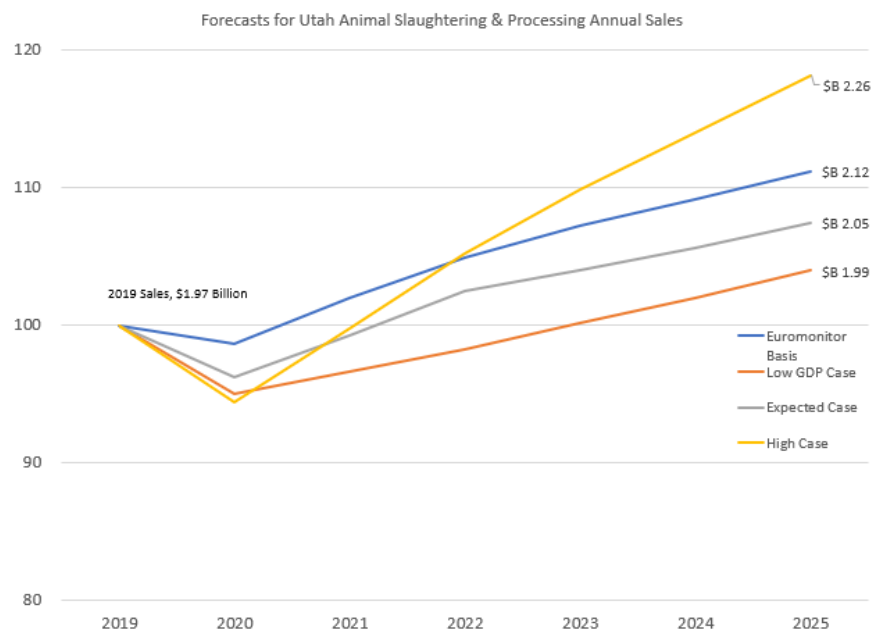


Figure 34 Animal Slaughtering & Processing Sales Forecast

Metals

According to PwC, a consultancy, the metals manufacturing industry was one of the sectors that was already facing a demand slowdown in 2019, so the COVID-19 pandemic led to significant pessimism for metals manufacturing's outlook. It is dependent in large part, however, on the performance of other manufacturing sectors including oil & gas, the auto industry and consumer appliances. The deep decline in projected petroleum sales is one of the major factors contributing to low forecast sales for metals manufacturers.

The Federal Reserve reported that metals fabrication had its sharpest fall in April with a decline of 11.2% over March, which itself was down 2.7%. Production rose modestly in May, by 1.5%. Euromonitor estimates show architectural and structural metals manufacturing as having a much stronger sales outlook (up 18.2% over 2019) than nonferrous and metal production and processing (7.2%).

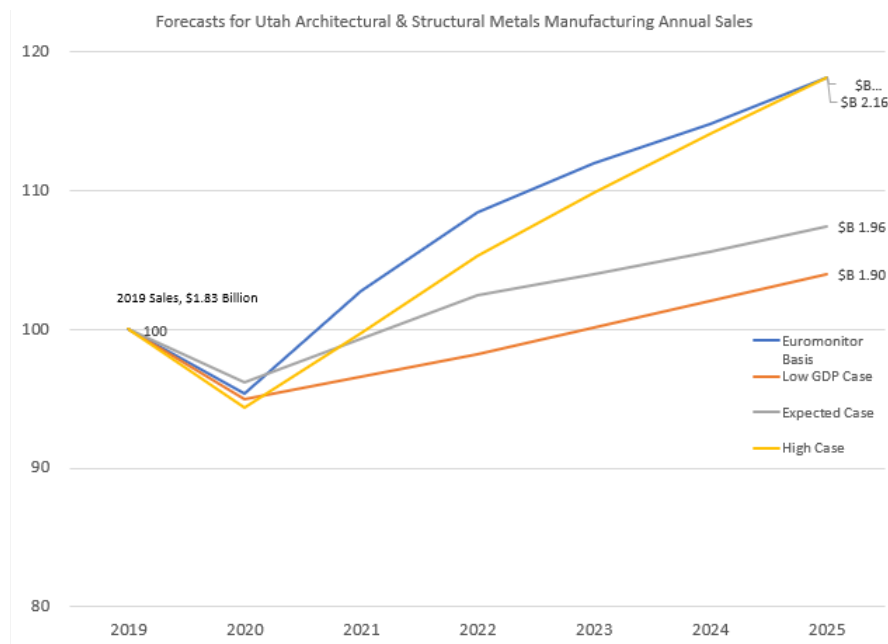


Figure 35 Architectural & Structural Metals Mfg. Sales Forecast

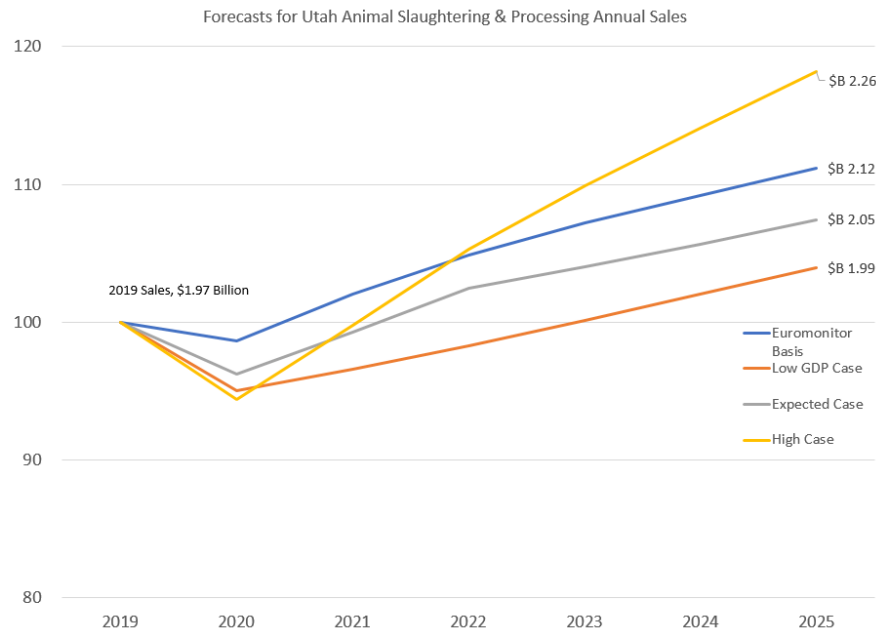


Figure 36 Nonferrous & Metal Production & Processing Forecast Annual Sales

Recreational Equipment

One of the state’s primary economic drivers is outdoor recreation and the design, manufacture and sale of sporting goods and outdoor products. Although it not among the top 10 industry products based on NAICS codes, recreational equipment is among the top 15 and has been identified as one of Utah’s economic clusters, with a strong level of export business. Within the state of Utah alone, more than 110,000 direct jobs exist within the outdoor economy, with more than \$3.9 billion in wages and salaries and \$737 million in tax revenue generated for the state . While the direct jobs related to outdoor recreation are significant, major employers in Utah, including Goldman Sachs and Lucid Software, have cited access to outdoor opportunities as a major draw for their expansion in the state.

In a recent webinar on COVID-19 effects, the Outdoor Industry Association (OIA) noted that for its members, disruption to the supply chain had been among the greatest challenges to overall performance. On the positive side, the industry expects exports to “rapidly” increase as various global economies stabilize Recreational equipment covers an array of goods categorized under Other Miscellaneous Manufacturing and is the basis for our 2019 sales value of \$1.75 billion. Euromonitor’s closest comparable category is Sports Goods. Based on Euromonitor’s analysis, the sector is expected to have rather weak performance, with 2019 sales performance not being matched until 2025.

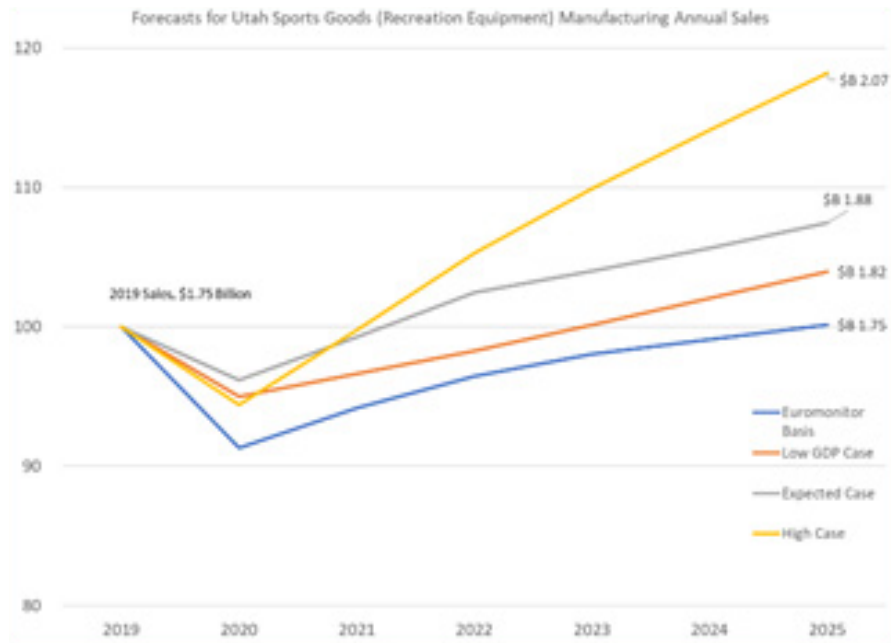


Figure 37 Recreation Equipment Manufacturing Forecast Sales

Findings

Forecasting the path to recovery from the devastating impacts from the COVID-19 pandemic is challenging as the economic data, which forms the basis for any forecast model, is slowly becoming available. Uncertainty remains as to the infections rates and thereby the impacts on recovery by manufacturers.

However, based on the analysis conducted for this study, Utah manufacturers are expected to exhibit the resiliency to rebound from the impacts of the COVID-19 pandemic. The underlying economy for the state provides a strong foundation for the recovery, especially as related to employment.

This overall sales forecast for Utah manufacturers is meant to serve as a valuable resource for the state's manufacturers, providing Utah businesses with insight based on overall GDP trends. We will update this study quarterly through 2021 to incorporate new economic data and as certainty begins to prevail as to infection rates.

Conclusions and Future Research

Individual Utah manufactured products are most likely to be influenced by shifts in some economic metrics more than GDP. As the forecast team does not have access to enough historical sales data for Utah manufacturers, the scope of analysis was necessarily constrained due to budgets and timing, individual econometric models and regressions for each Utah manufacturer product are not available. Such models, while good predictors with robust datasets, can be confusing for end users.

Consequently, as part of Using Market Demand to Manage Production Levels COVID-19 Market Demand Analysis and Forecast 2.0, the forecast team is developing a straightforward interactive tool that individual Utah manufacturers can use to weight specific economic variables with relation to their unique businesses. Users will access a secure, proprietary portal where they can save estimates and return to make adjustments and calculate new forecasts as new economic data become available.

A basic tabular view of the tool appears below. A Utah company enters its sales, selects the forecast year, and assigns the weight it wishes to apply to each economic metric against sales.

Utah Company - AAA Pharma						
6-Digit NAICS Category -325412						
2019 Sales	\$450,000,000 <---- User enters					
Forecast Year	2020					
Demand Effects Estimate						
	GDP	Real Capital Spending	Real Consumer Spending	Residential Investment	Exports	
From forecasts	-5.0%	-5.9%	-4.8%	1.0%	-16.3%	
Share of Company Sales Affected						
	GDP	Real Capital Spending	Real Consumer Spending	Residential Investment	Exports	Latent Sales (not affected by Changes in Metrics)
User selects value ----->	25.0%	0.0%	20.0%	15.0%	20.0%	20.0%
Amount exposed	\$112,500,000.00	\$0.00	\$90,000,000.00	\$67,500,000.00	\$90,000,000.00	\$90,000,000.00
Projected change	\$ (5,625,000.00)	\$ -	\$ (4,320,000.00)	\$ 675,000.00	\$ (14,670,000.00)	0
Projected 2020 Revenues	\$ 106,875,000.00	\$ -	\$ 85,680,000.00	\$ 68,175,000.00	\$ 75,330,000.00	\$ 90,000,000.00
Total Projected Revenue						\$ 426,060,000.00
Net Dollar Difference						(\$23,940,000.00)
Net Percent Change						-5.3%

Figure 38 Model of Customizable Forecast Tool for Utah Manufacturers

The interactive, web-based user interface version will incorporate sliders and defaults to simplify the experience.

This overall forecast and company specific forecasts in Using Market Demand to Manage Production Levels COVID-19 Market Demand Analysis and Forecast 2.0 will provide benchmarks for Utah's manufacturers to adjust production rates and resources to meet the new market demands resulting from the impacts of COVID-19.

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