

COVID-19: Economic Impact Analysis on Pierce County Service Region

September 2021

EXECUTIVE SUMMARY REPORT



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Acknowledgements

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Emsi Burning Glass provides labor market data that helps to create better outcomes for communities. Our data, which cover more than 99% of the U.S. workforce, are compiled from a wide variety of government sources, job postings, and online profiles and résumés. A variety of our clients use Emsi Burning Glass to align programs with regional needs and demonstrate their institution's economic impact on their region. Visit economicmodeling.com/ci-consulting to learn more or connect with us.



INTRODUCTION

Pierce county is one of nine counties located along the Mississippi River in Western Wisconsin that are members of the Mississippi River Regional Planning Commission (MRRPC)¹. MRRPC includes Buffalo, Crawford, Jackson, La Crosse, Monroe, Pepin, Pierce, Trempealeau, and Vernon counties. In 2020, the Pierce county population was 42,212², with a total regional employment of 12,294. The average earnings per job in 2020 was \$53,689, which is \$20,464 below the national average earnings per job.³

The Pierce county economy creates value in many ways. The employed labor force in Pierce generates new dollars and creates opportunities in the region.

MRRPC tracks Pierce's industries and studies the changes in taxes, earnings, and job market. An understanding of the regional economy and the economic impact effects of COVID-19 is vital to Pierce's efforts seeking to adapt to the post-pandemic economy.

Labor Force in Pierce
creates new opportunities
in their region.

The purpose of this report is to outline the region's economy and provide an economic impact analysis of COVID-19. This report will focus on the effects of job losses during 2020 caused by the pandemic and the impact they have had on the region's diverse industries. The following figures and tables display key findings of the analysis.

¹<https://mrrpc.com/about/>

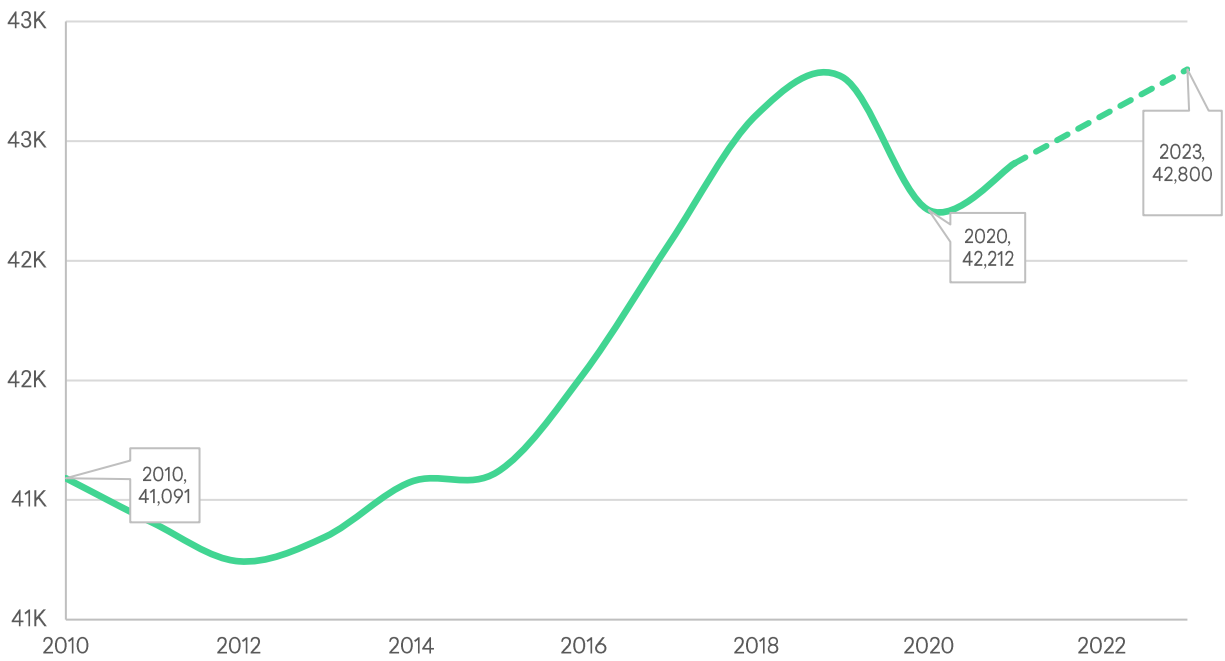
²<https://www.census.gov/library/stories/state-by-state.html>

³ Emsi Burning Glass proprietary data, collected on August 23, 2021.



In 2010, 41,091 people resided in Pierce. The county’s population is projected to be 42,800 people by 2023 (Figure 01).

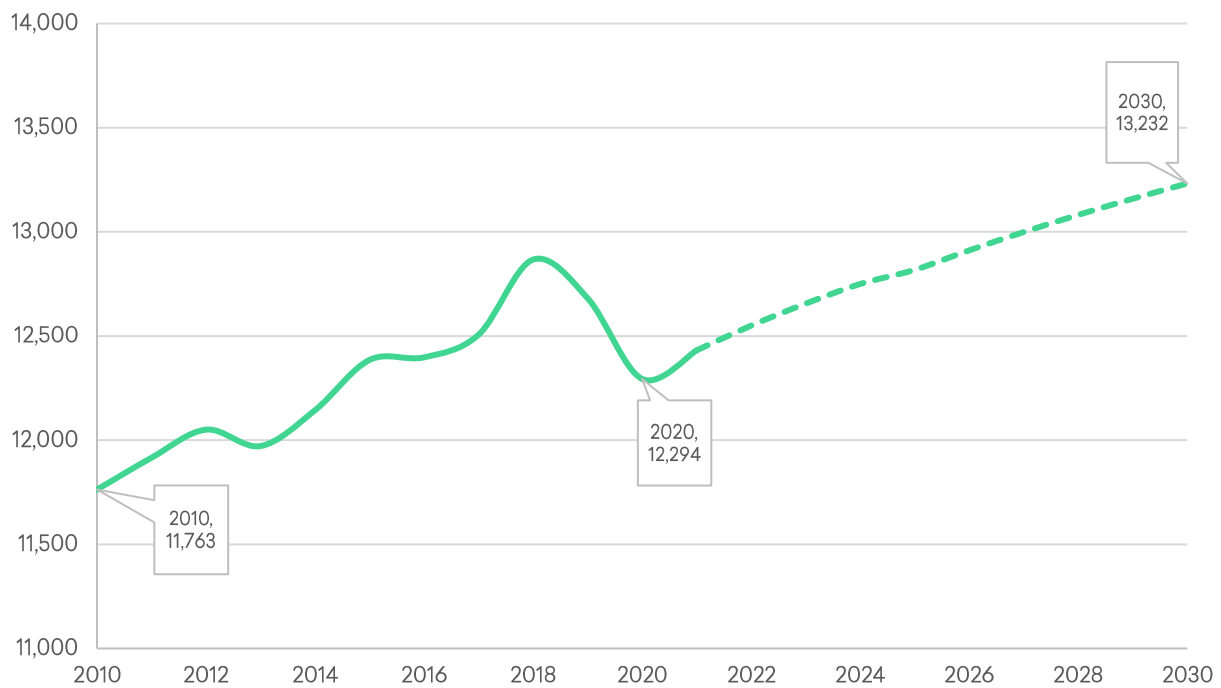
Figure 01: Historical and Projected Population in Pierce, 2010 to 2023



Source: Emsi Burning Glass demographics data, U.S. Census Bureau.

As shown in Figure 02, Pierce supported 11,763 jobs in 2010 and by 2020, the region had 12,294 jobs. In 2020 alone, the region lost 387 jobs. Due to data limitations, projections may not capture the total impact of COVID-19 on future labor markets.

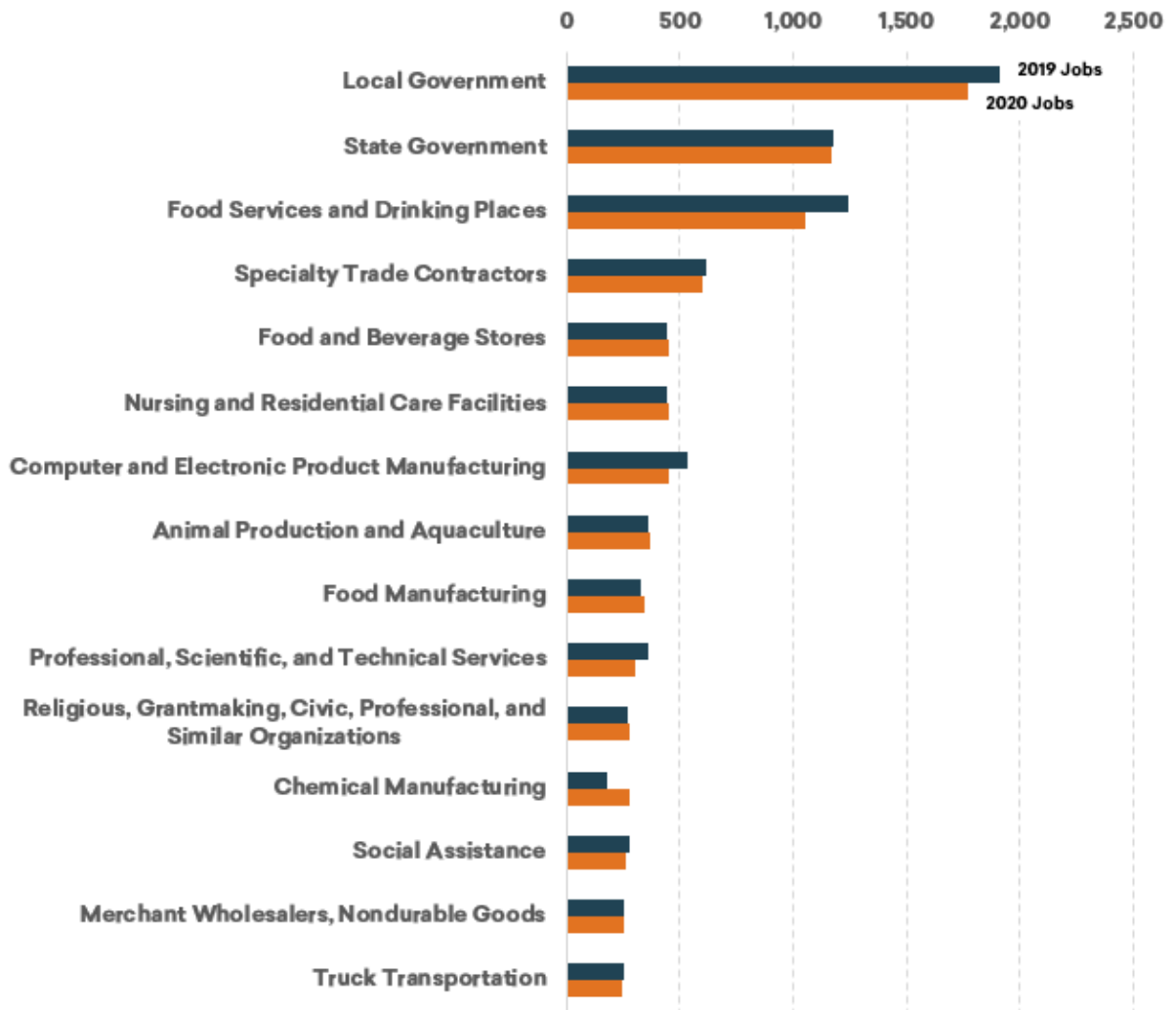
Figure 02: Historical and Projected Jobs in Pierce, 2010 to 2030



Source: Emsi Burning Glass 2021.3.

Figure 03 displays the top industry subsectors in terms of employment in Pierce. Local Government and State Government industries were the industries with highest number of jobs in 2019 and 2020.

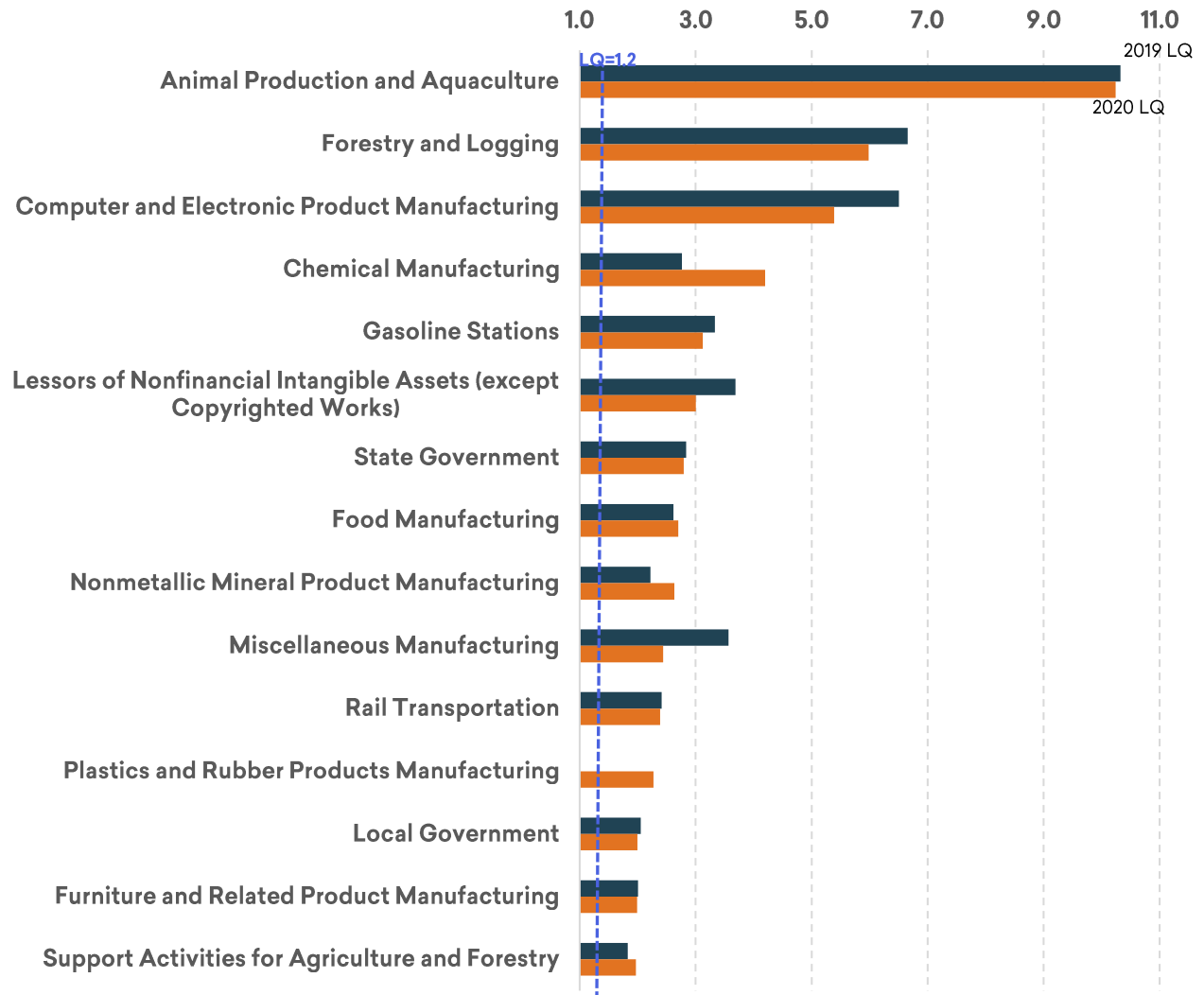
Figure 03: Top Industry Subsectors in Pierce by Jobs



Source: Emsi Burning Glass 2021.3.

Figure 04 shows the top industry subsectors in terms of employment concentrations, referred to as location quotients⁴ (LQs). High LQs (usually anything greater than 1.2) are an indication that the region has a comparative advantage or specialization in certain industry subsectors relative to the rest of the nation or to other regions.

Figure 04: Top Industry Subsectors in Pierce by Employment Concentration (LQ)



Source: Emsi Burning Glass 2021.3.

⁴ Location quotient (LQ) is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region unique. (<https://www.economicmodeling.com/2020/02/03/understanding-location-quotient-2/>).

Looking at industries in Figure 03, only 6 industries are within both the top 15 in terms of total jobs and in terms of relatively high LQs. The appearance of these industry subsectors provides an indication of their strength in the region’s economy and offers insight into potential employment opportunities for people in the region’s labor force that are looking for new professional opportunities. These industry subsectors, ranked by 2020 jobs, are:

- Local Government
- State Government
- Computer and Electronic Product Manufacturing
- Animal Production and Aquaculture
- Food Manufacturing
- Chemical Manufacturing

The data in Table 01 shows several of the region’s socioeconomic indicators as they compare to Wisconsin and the United States. Household income, reported as a median annual value, includes the income of all individuals in a household, 15 years and over, whether they are related to the householder or not. The median household income of Pierce is above both Wisconsin and the United States. Per capita income is calculated as the mean income for every person in the area divided by the aggregate income of the total population. In contrast, Pierce shows low unemployment and poverty rates when compared against the nation.

Table 01: Income, Unemployment, and Poverty Characteristics

	AVERAGE MEDIAN HOUSEHOLD INCOME	UNEMPLOYMENT RATE (2020)	AVERAGE PERCAPITA INCOME	AVERAGE POVERTY ALL PEOPLE
Pierce County	\$72,323	4.06%	\$33,061	4.00%
MRRPC Service Region	\$57,495	3.87%	\$29,488	6.90%
Wisconsin State	\$61,747	4.05%	\$33,375	7.20%
United States	\$62,843	6.50%	\$34,103	9.50%

Source: American Community Survey 2019 five-year estimates from the U.S. Census Bureau Data

Figure 05 displays the highest educational attainments in Pierce, the MRRPC Service Region, Wisconsin, and U.S. adults. Educational attainment⁵ data is useful for targeting specific population groups with less than or greater than average education levels. Here, Pierce shows the highest percentage of higher education degree holders and some college education when compared against the different regions.

Figure 05: Highest Educational Attainments

	<HS	HS	Some College	Associate's Degree	Bachelor's Degree	>Bachelor's
Pierce County	4.6%	31.5%	21.7%	12.4%	19.6%	10.2%
MRRPC	7.0%	32.7%	20.8%	12.6%	17.6%	9.2%
Wisconsin State	7.6%	30.2%	20.5%	11.1%	20.1%	10.6%
United States	11.8%	26.7%	20.3%	8.6%	20.0%	12.6%

Source: American Community Survey 2019 five-year estimates from the U.S. Census Bureau Data

⁵ Educational Attainment of the Population 25 Years and Over



ECONOMIC IMPACT ANALYSIS

Pierce's labor force promotes economic growth inside the region as well as in the state of Wisconsin through its direct contribution to income generated by work and the ripple effects that expenditures create. This is attained through the industries' interconnection in the regional economy (indirect effects) alongside the impact on household spending (induced effects). COVID-19 disrupted the regional economy in many different ways. One is the reduction of the labor force which will take a great deal of effort to return to pre-pandemic levels. The effects of COVID-19 on the region were measured via three scenarios described in the following section. Each of them will be presented via Type I and Type II Economic Effects. The loss of jobs between 2019-2020 were discounted by the typical rate of death, unemployment, and retirement previous to COVID-19 in order to get a more precise measure of economic effect of COVID on this particular region.

INPUT-OUTPUT MODEL: TYPE I & TYPE II ECONOMIC EFFECTS DESCRIPTION

An Input-Output model is a way of representing the flow of money in an economy, primarily among industries, while also accounting for government, households, and regional imports and exports. An industry is a group of business establishments that share similar end-products (or services) and processes for creating those products/services. Once the flow is represented in the model; we can introduce events that change the flow (such as loss or gain of jobs in one industry) and simulate its effects on each industry in the region, as well as the region as a whole. *The Input-Output model therefore indicates how a change in one part of the economy will ultimately affect other parts based on their economic relationships.*

When we talk about the Input-Output model, we sometimes hear the term “multiplier” used in discussions of economic policy and modeling, usually in the context of job creation or loss. Basically, a multiplier represents how much some aspect of a model will change in response to changes coming from “outside” the model. In other words, *the multipliers capture the changes and will describe the effects of those changes in terms of the original change (final effect = original change times the multiplier).*

In our particular case, we will talk about Type I and Type II multipliers.

Type I multiplier shows the industry-to-industry transactions. It is composed of Initial, Direct and Indirect Effects.

- *Initial Effect*: represents the first shock in the economy; in our case, it's the number of jobs that were lost during the pandemic in 2020, and therefore does not include ripple effects.
- *Direct Effect*: effects caused by the initially changed sectors; also describes the effects on those sectors' immediate supply chain.
- *Indirect Effect*: extends the concept of the direct multipliers to the supply chain's supply chain.

Type II multiplier adds to the Type I by introducing the effects by households (Induced Effect).

- *Induced Effect*: is due to the impact of the new earnings created by the Initial, Direct, and Indirect changes. These earnings enter the economy as employees spend their paychecks within the region on food, clothing, and other goods and services. In other words, this figure represents the income effects on inter-industry trade.

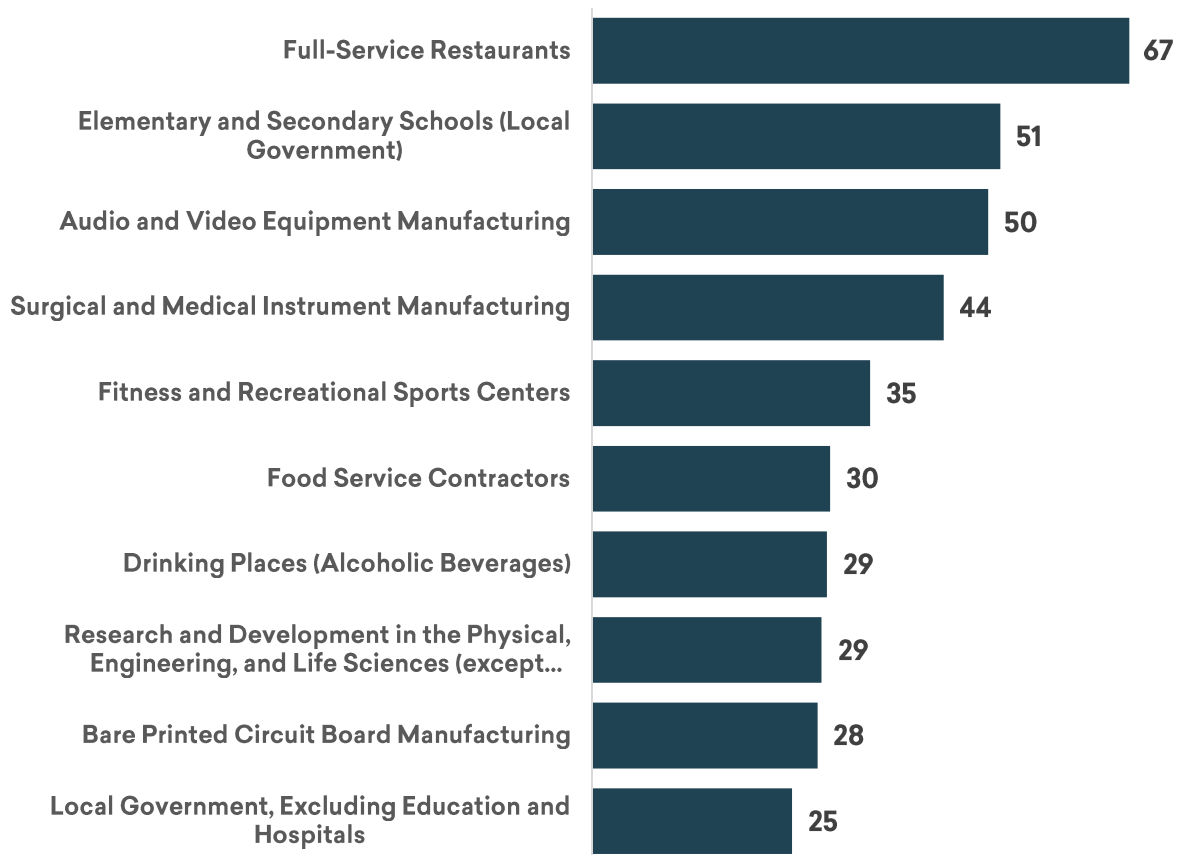
Another description for Type II: business/industry growth or decline that is going to affect the income of individuals and if the individuals spend it or not back in the economy, thus affecting the economy as a whole.

First Scenario:

The first scenario included all industries in which the number of jobs by industries in 2019 were larger than the number of jobs in 2020.

The total number of industries in this scenario were 193. Figure 06 displays the top 10 industries with the highest number of job losses.

Figure 06: Top 10 Industries for All Industries with the Highest Number of Job Losses during 2020



Source: Emsi Burning Glass 2021.3

In this scenario, the total number of lost jobs caused by the pandemic sum up to 866 jobs. Job losses shown by Figure 06 represent close to 45% of all jobs lost during 2020.

The total impact on Jobs, Earnings and Taxes on Production & Imports (TPI) by Type I and Type II effects are presented below.

The number of job losses during the pandemic increased to 1,004 for Type I and 1,076 for Type II economic effect. In other words, because of the initial 866 lost jobs, there are 138 that are full-time, part-time, and seasonal employee jobs in industries that are part of their supply chain (Type I effect) that were lost. Additionally, there are an additional 72 jobs that were lost because they were no longer supported by the 1,004 jobs already lost in the region (Type II effect).

The top 10 industries in Figure 06 showed a total effect of job loss by 19% compared to their initial effect with a total difference of -42 jobs for Type I and -75 Type II. (Table 02).

**Table 02: Top 10 Industries All Industries Scenario
Change in Jobs**

Industries Name	Initial Effect	Type I	Type II
Full-Service Restaurants	67	71	73
Elementary and Secondary Schools (Local Government)	51	53	57
Audio and Video Equipment Manufacturing	50	52	58
Surgical and Medical Instrument Manufacturing	44	48	53
Fitness and Recreational Sports Centers	35	37	38
Food Service Contractors	30	31	33
Drinking Places (Alcoholic Beverages)	29	30	31
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	29	45	51
Bare Printed Circuit Board Manufacturing	28	31	34
Local Government, Excluding Education and Hospitals	25	31	34
Other Industries	479	574	614
All Industries	866	1,004	1,076

Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

Total Effects by Job Loss in 2019-20 due to COVID 19



* Total Type II Loss

In terms of Earnings loss, the total initial loss of earnings was \$24,844,591 where the total effect of Type I is 2.12 times higher and Type II 2.21 times increase over the initial effect. Table 03 shows an initial loss (Initial Effect) of \$16,781,980 and an economic impact of \$18,413,896 loss on Type I and \$19,196,404 on Type II effects, for the top 10 industries, which represents 14% of the total effects on Type I and Type II.

Table 03: Top 10 Industries All Industries Scenario Loss Earnings

Industries Name	Initial Effect	Type I	Type II
Audio and Video Equipment Manufacturing	\$5,293,998	\$5,406,287	\$5,590,384
Surgical and Medical Instrument Manufacturing	\$3,167,607	\$3,323,377	\$3,477,840
Industrial Sand Mining	\$2,250,562	\$2,596,066	\$2,719,517
Bare Printed Circuit Board Manufacturing	\$2,011,451	\$2,150,865	\$2,229,988
Construction Sand and Gravel Mining	\$1,244,348	\$1,426,372	\$1,493,278
Wind Electric Power Generation	\$657,962	\$787,837	\$839,967
Other Animal Food Manufacturing	\$650,332	\$1,044,586	\$1,092,316
Commercial Banking	\$542,783	\$630,031	\$662,296
All Other Miscellaneous Manufacturing	\$491,747	\$541,077	\$564,808
Commercial and Institutional Building Construction	\$471,191	\$507,398	\$526,011
Other Industries	\$8,062,611	\$34,344,657	\$35,773,879
All Industries	\$24,844,591	\$52,758,554	\$54,970,283

Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

The loss on Taxes on Production and Imports (TPI) measures the change in local, state, and federal tax revenue through the increased or decreased industry sales, specifically general sales, and property taxes. It's important to note the change in tax revenue corresponds to the ripple effects and cannot be tied to a particular timeframe. Pierce county lost \$10,391,047 on TPI where 17% corresponds to Federal, 38% to State and 45% to Local Government taxes. The top 10 industries represent 57% of the total loss on TPI (Table 04).

Table 04: Top 10 Industries All Industries Scenario Loss on Taxes on Production & Imports

Industries Name	Total Loss on Taxes on Production and Imports	Federal	State	Local
Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	\$3,879,321	\$422,244	\$1,556,952	\$1,900,126
Wind Electric Power Generation	\$791,125	\$131,745	\$304,173	\$355,206
Industrial Sand Mining	\$636,862	\$118,266	\$241,293	\$277,304
Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	\$357,472	\$171,012	\$104,849	\$81,611
Construction Sand and Gravel Mining	\$332,717	\$61,263	\$126,212	\$145,243
Audio and Video Equipment Manufacturing	\$284,391	\$67,519	\$103,449	\$113,422
Full-Service Restaurants	\$282,635	\$39,508	\$110,878	\$132,249
Gasoline Stations with Convenience Stores	\$276,026	\$35,416	\$109,211	\$131,398
Nonscheduled Chartered Passenger Air Transportation	\$266,223	\$41,951	\$103,054	\$121,217
Other Animal Food Manufacturing	\$237,892	\$50,212	\$88,367	\$99,312
Other Industries	\$3,046,383	\$632,116	\$1,134,826	\$1,279,441
All Industries	\$10,391,047	\$1,771,252	\$3,983,266	\$4,636,529

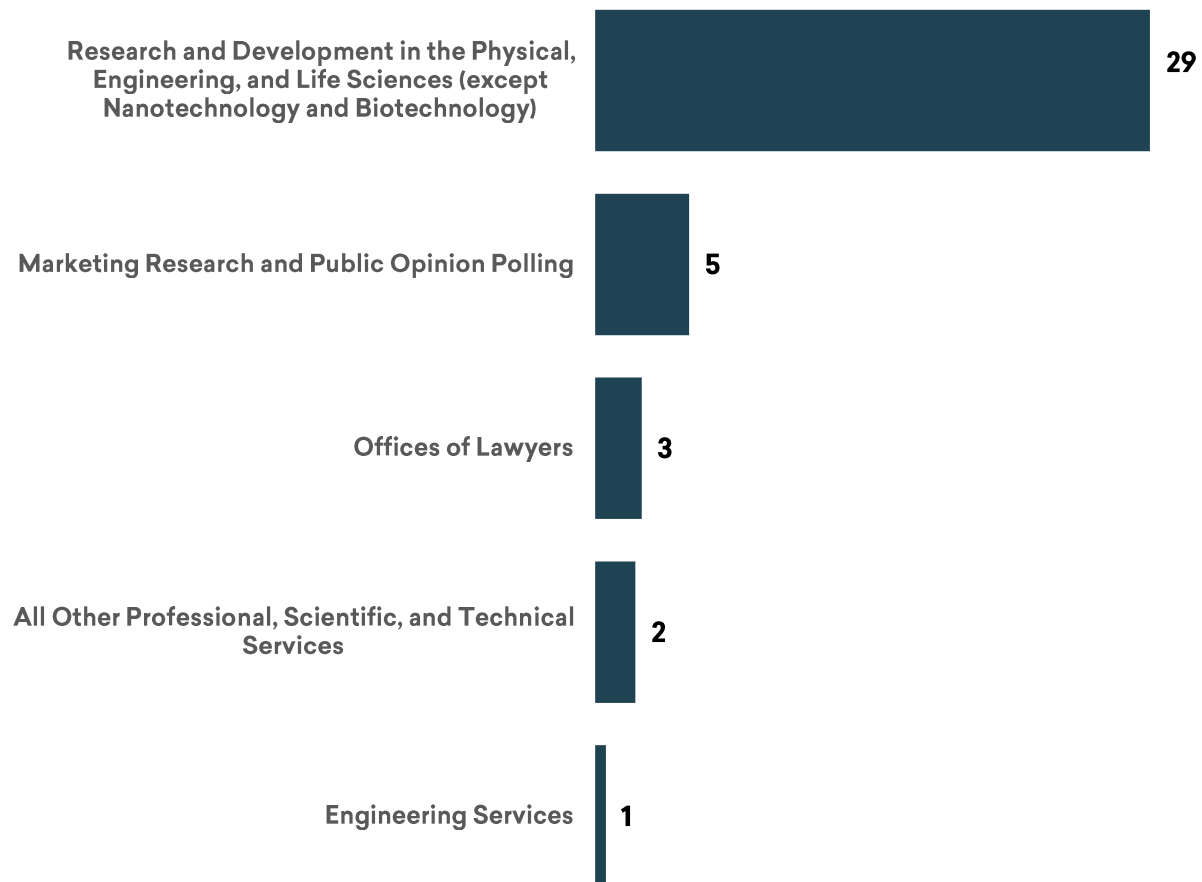
Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

Second Scenario:

The second scenario groups industries which performed worse in terms of job loss, unemployment, and job postings, after having been compared at the national level. We selected the industries from two digit NAICS code to six-digit NAICS code.

We called this set of industries the “Most Affected,” relative to national levels. There were five industries in the second scenario. Figure 07 displays the industries with number of job losses.

Figure 07: Most Affected Industries with the Highest Job Losses during 2020



Source: Emsi Burning Glass 2021.3

The number of total jobs lost for the 5 industries adds up to 40 jobs.

The number of job losses during the pandemic increased to 57 for Type I and to 64 Type II economic effects. In other words, because of the 40 losses in jobs, there were 17 full-time, part-time, and seasonal employee lost jobs in industries that are part of their supply chain (Type I effect). Additionally, there were an additional 7 jobs lost because they were no longer supported by 57 jobs already lost in the region (Type II effect).

Total Effects by Job Loss in 2019-20 due to COVID 19



Table 05: Most Affected Industries Scenario
Change in Jobs

Industries Name	Initial Effect	Type I	Type II
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	29	45	51
Marketing Research and Public Opinion Polling	5	5	5
Offices of Lawyers	3	3	4
All Other Professional, Scientific, and Technical Services	2	3	3
Engineering Services	1	1	1
All Industries	40	57	64

Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

* Total Type II Loss

In terms of earnings loss, Table 06 shows an initial loss of earnings of \$5,063,145 where the total effect of Type I is 27% higher and Type II 32% increase over the initial effect.

Table 06: Most Affected Industries Scenario Loss Earnings

Industries Name	Initial Effect	Type I	Type II
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	\$4,621,275	\$5,914,996	\$6,128,976
Offices of Lawyers	\$277,560	\$337,619	\$350,075
Engineering Services	\$62,322	\$77,733	\$81,033
Marketing Research and Public Opinion Polling	\$56,618	\$67,857	\$70,415
All Other Professional, Scientific, and Technical Services	\$45,370	\$54,382	\$56,505
All Industries	\$5,063,145	\$6,452,586	\$6,687,003

Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

As was mentioned before, the loss on taxes on production and imports (TPI) measured the change in local, state, and federal tax revenues through general sales and property taxes. The county lost \$212,712 on TPI where 24% corresponds to federal government, 36% to state and 39% to local governments (Table 07).

Table 07: Most Affected Industries Scenario Loss on Taxes on Production & Imports

Industries Name	Total Loss on Taxes on Production and Imports	Federal	State	Local
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	\$166,837	\$41,572	\$60,114	\$65,150
Offices of Lawyers	\$39,824	\$8,800	\$14,678	\$16,346
Engineering Services	\$2,454	\$541	\$905	\$1,008
Marketing Research and Public Opinion Polling	\$1,973	\$567	\$689	\$717
All Other Professional, Scientific, and Technical Services	\$1,624	\$464	\$568	\$592
All Industries	\$212,712	\$51,945	\$76,954	\$83,813

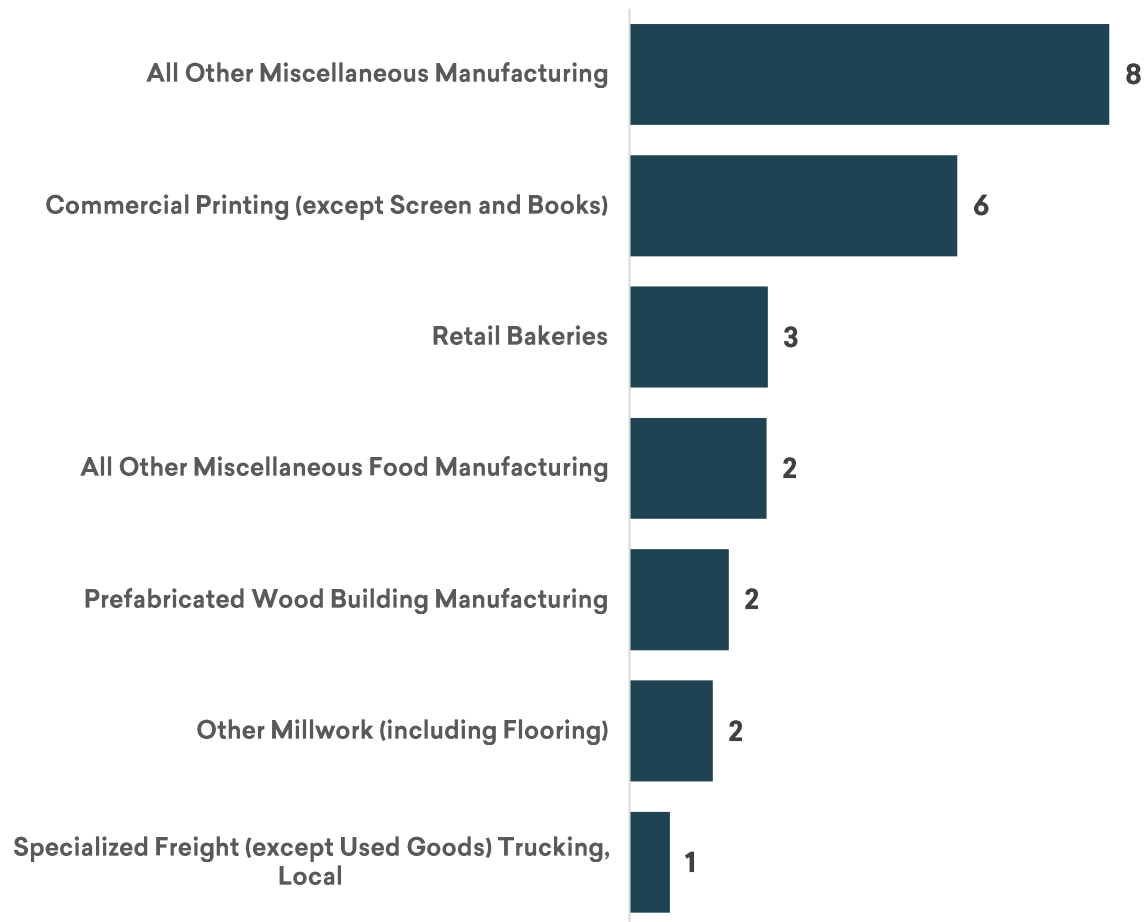
Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

Third Scenario:

For our third scenario, we look at industries that are the most relevant to the region. Some of the industries included are All Other Miscellaneous Manufacturing, Commercial Printing, as well as industries where the largest employers in the region are classified.

We called this set of industries the “Most Relevant.” The total number of industries on this scenario were 7. Figure 08 displays the industries with their number of jobs lost.

Figure 08: Most Relevant Industries with Number of Job Loss during 2020



Source: Emsi Burning Glass 2021.3

In our third scenario, the total job loss for the 7 industries amount to 23 jobs during 2020.

The job losses increased to 27 for Type I and for 29 for Type II economic effects. In other words, because of the 23 losses on jobs there were 4 that were full-time, part-time, and seasonal employee jobs in industries that were part of their supply chain (Type I effect) that were lost. Additionally, there were 2 jobs lost because they were no longer supported by the 27 jobs already lost in the region (Type II effect).

Total Effects by Job Loss in 2019-20 due to COVID 19



**Table 08: Most Relevant Industries Scenario
Change in Jobs**

Industries Name	Initial Effect	Type I	Type II
All Other Miscellaneous Manufacturing	8	9	10
Commercial Printing (except Screen and Books)	6	7	7
Retail Bakeries	3	3	3
All Other Miscellaneous Food Manufacturing	2	4	4
Prefabricated Wood Building Manufacturing	2	2	2
Other Millwork (including Flooring)	2	2	2
Specialized Freight (except Used Goods) Trucking, Local	1	1	1
All Industries	23	27	29

Source: Multi-regional social account matrix model (MR-SAM), 2021.3, years 2019/2020.

* Total Type II Loss

In terms of earnings loss, the initial loss was \$1,148,752 where the total effect of Type I was 14% higher and Type II increased 19% over the initial effect (Table 09).

Table 09: Most Relevant Industries Scenario Loss Earnings

Industries Name	Initial Effect	Type I	Type II
All Other Miscellaneous Manufacturing	\$491,747	\$541,077	\$564,808
Commercial Printing (except Screen and Books)	\$263,888	\$293,515	\$306,972
All Other Miscellaneous Food Manufacturing	\$155,776	\$205,212	\$213,798
Prefabricated Wood Building Manufacturing	\$86,582	\$99,255	\$103,552
Other Millwork (including Flooring)	\$65,683	\$79,605	\$83,090
Specialized Freight (except Used Goods) Trucking, Local	\$59,702	\$70,058	\$72,237
Retail Bakeries	\$25,375	\$28,464	\$29,537
All Industries	\$1,148,752	\$1,317,185	\$1,373,994

Source: Multi-regional social account matrix model (MR-SAM). 2021.3, years 2019/2020.

The loss on taxes in production and imports (TPI) measured the change in local, state, and federal tax revenue specifically through general sales, and property taxes, showing Pierce lost \$90,618 on TPI. 27% corresponded to federal government, 35% to state and 37% to local governments (Table 10).

Table 10: Most Relevant Industries Scenario Loss on Taxes on Production & Imports

Industries Name	Total Loss on Taxes on Production and Imports	Federal	State	Local
All Other Miscellaneous Manufacturing	\$33,023	\$8,993	\$11,675	\$12,355
Commercial Printing (except Screen and Books)	\$20,653	\$5,892	\$7,224	\$7,538
All Other Miscellaneous Food Manufacturing	\$17,347	\$4,759	\$6,123	\$6,465
Prefabricated Wood Building Manufacturing	\$6,793	\$2,254	\$2,284	\$2,255
Other Millwork (including Flooring)	\$6,120	\$1,926	\$2,088	\$2,106
Specialized Freight (except Used Goods) Trucking, Local	\$5,324	\$870	\$2,052	\$2,402
Retail Bakeries	\$1,359	\$326	\$494	\$540
All Industries	\$90,618	\$25,020	\$31,938	\$33,660

Source: Multi-regional social account matrix model (MR-SAM). 2021.3, years 2019/2020.



CONCLUSION:

The results of this study demonstrate the pervasive economic effects COVID-19 had on Pierce county in each of the output scenarios.

One of the most relevant results came from the total effect on TPI by job losses in all industries, where more than 70% is attributed to the 10 industries under the first scenario.

The job projections suggest an increase over time. Finally, the 866 initial lost jobs translated to close \$55 million in earnings lost and a \$10 million loss on TPI. This loss will affect the region deeply.

The results of this study demonstrate the profound effect of COVID-19 on Pierce county across **multiple scenarios**.

About the Study

Data and assumptions used in the study are based on several sources, including industry and employment data from the U.S. Bureau of Labor Statistics and U.S. Census Bureau, outputs of Emsi Burning Glass' Multi-Regional Social Accounting Matrix model. The study applies a conservative methodology and follows standard practices using only the most recognized indicators of economic impact. For a better description of the data and approach used in the study, please review the Methodology document.