

Novel COVID-19 Virus Economic Impact

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Introduction

The purpose of this report is to provide an update on the economic impact caused by the novel coronavirus outbreak. The outbreak began in December 2019 in Wuhan, China and has since spread to over 175 countries and territories [1]. The pandemic has caused an economic downturn in the US and around the world, as policies have been put into place to fight the pandemic. The policies have put financial strains on companies and businesses as they adapt their business practices or operations to keep up with the changes [2].

The rest of the paper will give specifics about the virus, including a brief background of the virus and statistics, followed by economic impact on the national and Pennsylvania levels and finally, some information about political policies that might be relevant.

Coronavirus Background and Statistics

Background of the Current Coronavirus Outbreak

“Coronavirus” refers to a family of viruses that tend to cause upper respiratory diseases like the common cold, as well as more serious illnesses like severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) [3]. The new virus, called the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes the coronavirus disease of 2019, or COVID-19 for short. What makes SARS-CoV-2 different, is that it is a new virus that has not been previously seen before, making humans more vulnerable to it as they have not developed anti-bodies and immune responses to it, nor has scientific research been conducted to develop vaccines or treatments.

Outbreak Numbers

As of April 1, 2020, there are over 900 thousand confirmed cases of COVID-19 in the world, and over 200 thousand confirmed cases in the US. The US has the highest nominal number of cases [4].

Table 1: US Confirmed COVID-19 Cases [5]

March 18 – March 24			
Confirmed Cases Total	Average Number of New Cases (7-day Average)	% Change Over Week Period	Average Daily % Change
54,453	6,774	421.48%	34.26%
March 25 – April 1			
Confirmed Cases Total	Average Number of New Cases (7-day Average)	% Change Over Week Period	Average Daily % Change
213,144	18,807	211.43%	18.68%

The percent change over the last seven-day period has declined in the US, though the average number of new cases has increased. The graph below shows the total number of cases in the US as a time series (blue line and right axis) as well as the daily number of new cases (orange bars, left axis) and a 5-day moving average of new cases (black dotted line, left axis). The moving average helps to understand the trajectory of the new cases, as it removes some of the variability in the day-to-day changes. We see the

moving average trend become less steep (indicating a slowing of new cases) around March 28th. As it is a fairly new trend, more data will be required to see if the trend holds.

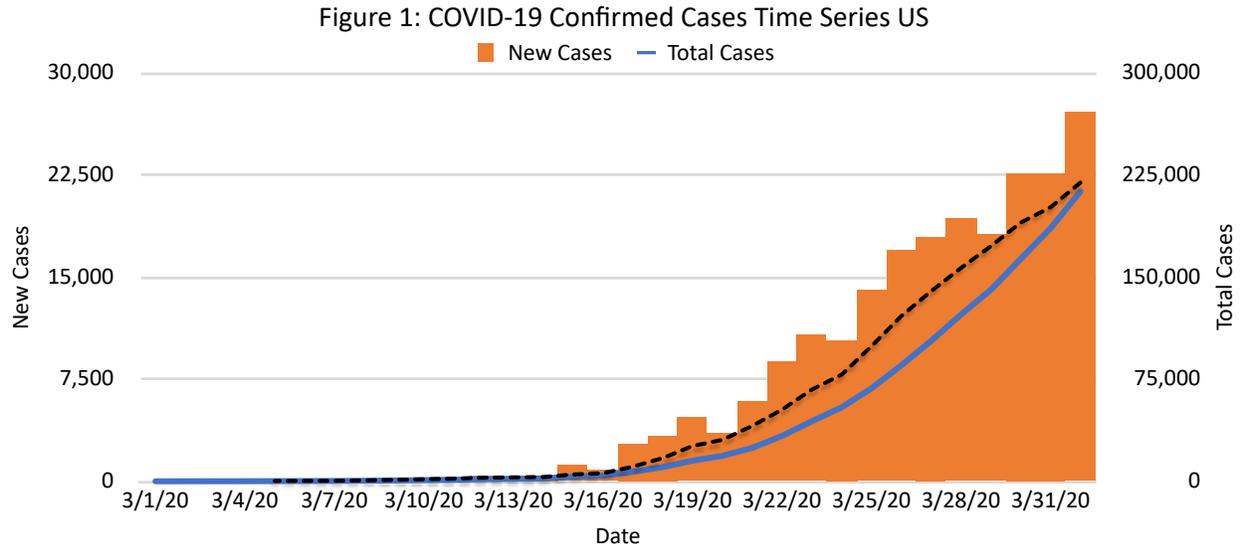
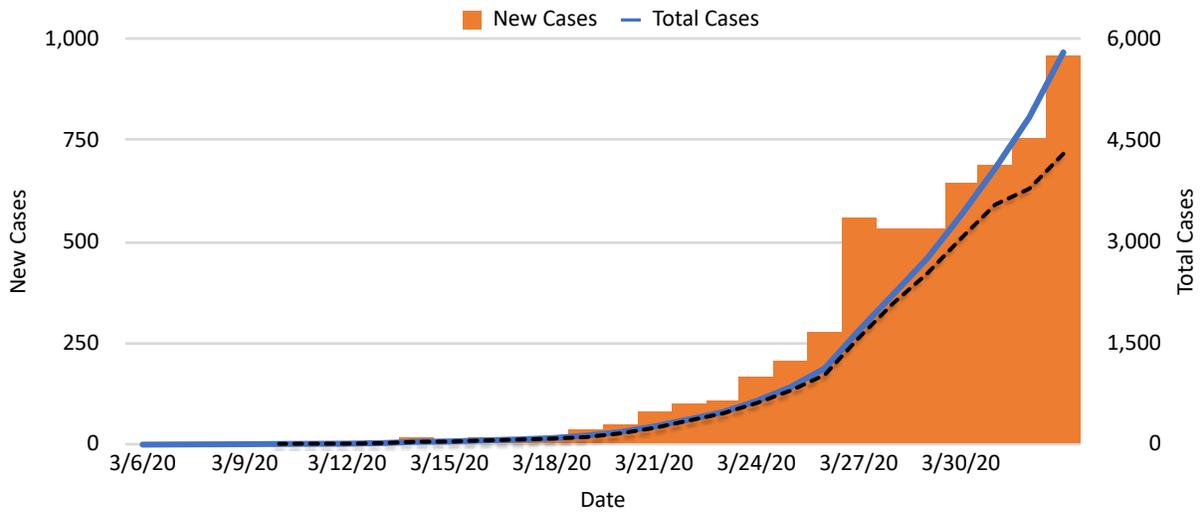


Table 2: PA Confirmed COVID-19 Cases [6]

March 18 – March 24			
Confirmed Cases Total	Average Number of New Cases (7-day Average)	% Change Over Week Period	Average Daily % Change
1,127	142	509.19%	35.79%
March 24 – April 1st			
Confirmed Cases Total	Average Number of New Cases (7-day Average)	% Change Over Week Period	Average Daily % Change
5,805	570	415.08%	28.56%

Pennsylvania also so the nominal number of cases increase to just over 5,800 in the last seven days, but the percent change overall and average daily percent change went down. The graph below also shows the time series for Pennsylvania cases, the daily number of new cases and a 5-day moving average that helps to show trends in the number of new cases. Similar to the US overall, Pennsylvania’s 5-day moving average is also showing signs of slowing in the last few days as the slope of the moving average becomes less steep, but it has happened to recently to be able to assume that the trend will hold long-term.

Figure 2: COVID-19 Confirmed Cases Time Series PA



Projecting COVID-19 Cases

There have not been any updates in the Trefis model since March 23rd. Trefis has been modeling the number of US cases based on the similarities to other countries. As of March 23rd, Trefis indicated that the US had not yet managed to “flatten the curve of infection”, and are now basing their model on the German or Italian outbreaks [7]. If the US continues on the German trajectory model, Trefis projects that the US will plateau at around 221,000 cases. If instead the US ends up following the Italian trajectory model, the US will be projected to have approximately 680,000 cases.

Figure 2: German Model for US Forecast [7]

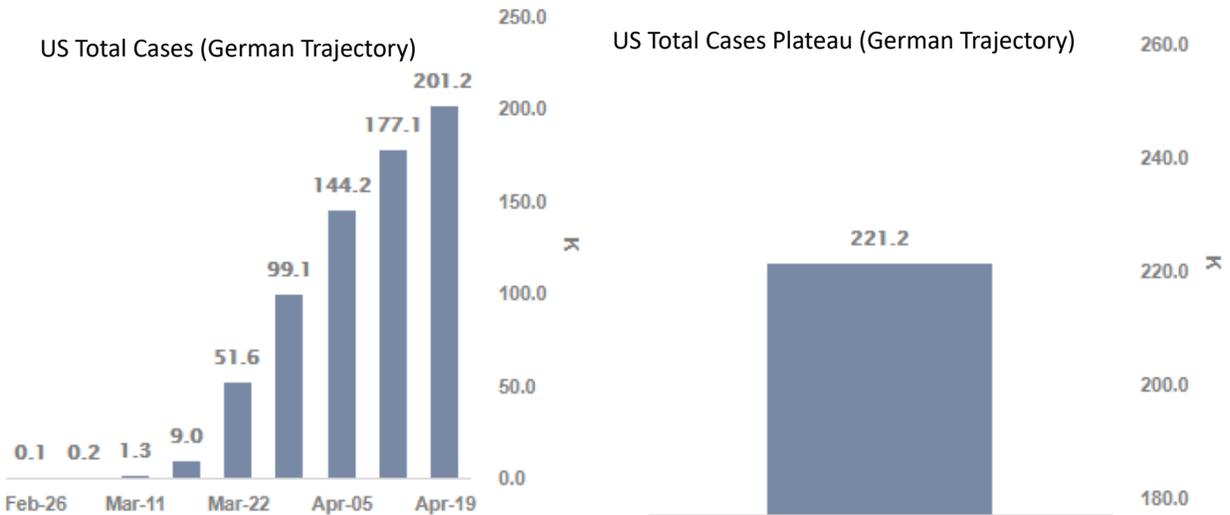
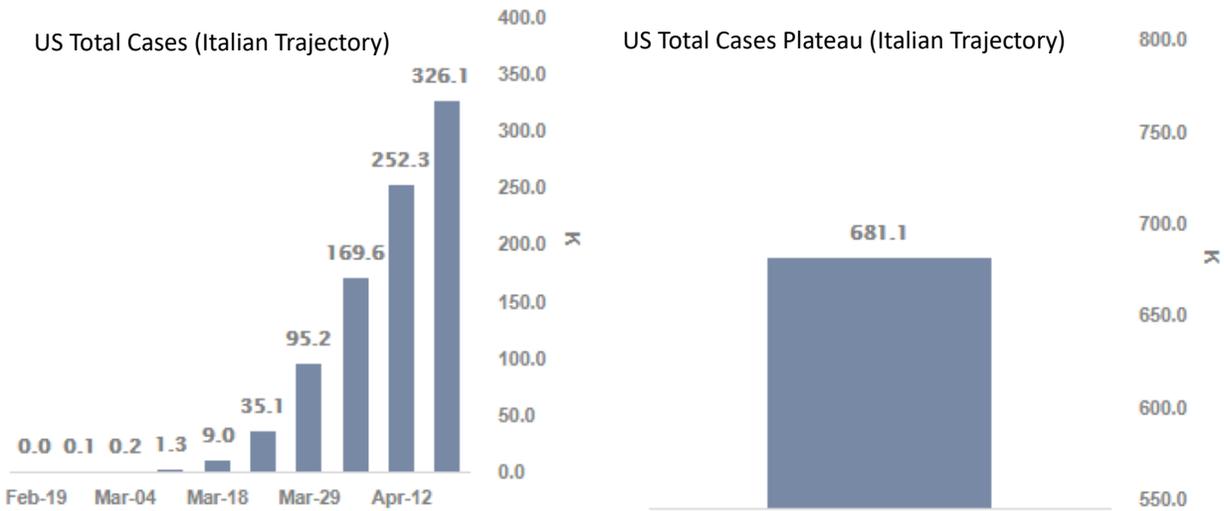


Figure 3: Italian Model for US Forecast [7]



Economic Forecast

The economic landscape is shifting regularly as effects from the outbreak put a strain on businesses. With so much uncertainty, it can be difficult to predict or forecast, as new information and changing regulations can quickly make predictions obsolete. One thing that is clear is that a recession is almost certain to hit the US and the World, what is less clear is the length and severity of that recession.

Unemployment

The US Bureau of Labor Statistics (BLS) indicated that the February 2020 unemployment rate was at 3.5% and with an employment participation rate of 63.4%. As of the week that began March 15th, the Wall Street Journal estimates that the number of jobless claims rose by nearly 3.3 million, or approximately 2% of the US labor force [8]. The week beginning March 30th saw an additional 3.3 million jobless claims, bringing the total change to 6.6 million in two weeks [9]. The change in is 4% of the US labor force, bringing the unemployment rate to approximately 7.5%.

Table 3: Unemployment Changes

Week Dates	New Jobless Claims
March 15 th – March 21 st	3,300,000
March 22 nd – March 28 th	3,300,000
Total	6,600,000

Table 4 below shows the Wall Street Journal’s economic forecast as of March 24th. With the jobless claim data that has been reported, it appears that the US has exceeded the pessimistic unemployment forecasts.

Table 4: Unemployment Forecasts as of March 24th [2]

Quarter	Optimistic	Baseline	Pessimistic
Q2 2020	4.5%	5.3%	6.3%

Q3 2020	4.5%	5.1%	7.0%
Q4 2020	4.5%	5.5%	7.4%

Leading economists have updated their forecasts, with the most extreme coming from the Federal Reserve Bank of St. Louis which is projecting a loss of 47 million jobs through quarter 2 of 2020 (32.1% unemployment rate) [10]. The most optimistic forecasts suggests a quarter 2 unemployment rate of 8.5% [11], while the middle of the road estimates suggests unemployment figures in the low to mid-teens [12]. The median projected unemployment rate for the five projections listed is 15% with an average of 17%.

Table 5: Unemployment Forecasts for Q2 Updated [11]

Group	J.P. Morgan	Capital Economics	Goldman Sachs	KPMG LLP	FRB St. Louis
Forecast	8.5%	12%	15%	17%	32%

Real GDP Growth

Real gross domestic product (GDP) measures the value of all goods and services produced by an economy in a given timeframe, adjusted for inflation. The second estimate for the 4th quarter of 2019 has the US real GDP growing at 2.1% according to the US Bureau of Economic Analysis.

All three of the March 24th projections in the Wall Street Journal show a contraction in quarter 2 of 2020, the baseline projection for quarter 2 has a -7% GDP growth rate, with optimistic predictions projecting a -4% rate and pessimistic projections forecasting a -10% rate. The optimistic forecast suggests that the economy would bounce back fairly quickly, with a positive GDP growth rate in quarter 3 and 4 of 2020, while the baseline forecast suggests a longer recovery period with quarter 3 having no growth, and quarter 4 beginning the recovery with a 2.6% growth rate. The pessimistic forecast suggests a prolonged recession, with the economy projected to contract through all of 2020 [2].

Table 4: Real GDP Forecast March 24th [2]

Quarter	Optimistic	Baseline	Pessimistic
Q2 2020	-4%	-7%	-10%
Q3 2020	1.7%	0%	-3.8%
Q4 2020	3.1%	2.6%	-0.5%

With the 1st quarter of 2020 just ending, the impact of the COVID-19 outbreak on the US GDP in the first quarter has not yet been officially calculated, however the Federal Reserve Bank of New York estimates a 1.7% growth rate for quarter 1 of 2020 followed by a 0.3% growth rate in quarter 2 of 2020 [13].

International Trade

The US trade balance is the difference between the value of goods and services being exported to foreign countries and the value of goods and services being imported from foreign countries. If the US is importing more goods and services than they are exporting, the US is said to have a trade deficit, while exporting more causes a trade surplus. According to Statista.com, the US had a trade deficit of just over \$600 billion in 2019 [14].

The top 10 countries that trade with the US, in terms of dollar value of exports and imports, make up 65% of the US trade total [15]. China, Vietnam and India are still projected to have reasonably high growth even after accounting for the pandemic. The US tends to run deficits with those countries; in 2019 the US imported \$345.6 billion more than they exported to China, \$55.8 billion more from Vietnam and \$23.3 billion from India [15]. This may not be a problem, as many times parts and materials needed for products being manufactured in the US are imported from foreign countries, but then assembled domestically. While certainly entire products are also imported, knowing that the Indian, Vietnamese and Chinese economies are not projected to have a year-long contraction means that, hopefully, the US will still be able to get the parts and materials necessary for production that happens domestically. Unfortunately, four of the US's top 10 trading partners are expected to have growth below 1% in 2020. With projections that low, it doesn't take much of a change for those economies to slip into a recession, causing the market for US goods to shrink, but also making parts and materials manufactured in those areas less prevalent, and thus more expensive. The World's GDP is expected to grow at 2.4% after accounting for shocks caused by COVID-19.

Table 5: Economic Snapshot of the US's Top Ten Trade Partners

Country	Jan 2020 Trade (Import \$ + Export \$) [15]	2020 Projected GDP (Change from previous projection) [16]
Mexico	\$49.2 Billion	0.7% (-0.5%)
Canada	\$47.9 Billion	1.3% (-0.3%)
China	\$40.5 Billion	4.9% (-0.8%)
Japan	\$15.9 Billion	0.2% (-0.4%)
Germany	\$14.5 Billion	0.3% (-0.1%)
South Korea	\$11.5 Billion	2.0% (-0.3%)
United Kingdom	\$10.4 Billion	0.8% (-0.2%)
India	\$7.9 Billion	5.1% (-1.1%)
Taiwan	\$7.6 Billion	2.4% (-0.4%) [17]
Vietnam	\$7.0 Billion	6.2% (-0.6%) [18]
All Countries	\$4.1 Trillion	2.4% (-0.5%)

(Source: OECD and Census Bureau unless otherwise noted)

PA Economy

There have not been updates to the projections for Pennsylvania's economy, however the Wall Street Journal reported that Pennsylvania's jobless claims rose by 363 thousand during the week beginning March 15th. The increase in jobless claims would increase the state unemployment rate from 4.7% to 5.8% [19].

As of March 25th, TD Bank Group recently released economic forecasts for Pennsylvania in the face of the COVID-19 outbreak. TD Bank Group suggests that supply chain disruptions will slow the manufacturing industry's recovery, which had begun to gain momentum in Pennsylvania, but will now slow or even reverse due to the pandemic. The recent oil price drops have also impacted the PA economy, as investors are pulling back and payrolls begin to decline. There is hope in the energy sector however, as Texas oil

production declines, Marcellus Shale producers could gain a larger foothold in the industry. The Chinese tariffs on liquid natural gas (LNG) could also improve matters, as would the completion of several long-horizon projects [20].

TD Bank Group is fairly optimistic about the PA economy after the pandemic clears up. Pennsylvania had already been trying to transform its economy to be based around professional and technical services and office-using employment has made up a majority of the job gains in recent months. Many of these jobs can be performed from home, and so will not suffer as much due to the social distancing measures. And so, TD Bank Group is projecting that once the COVID-19 outbreak slows, the PA economy should be able to get back to a positive trajectory [20].

Table 6: PA Economic Forecast March 25th [20]

Year	Real GDP Growth Rate	Employment Growth Rate	Unemployment Average Percentage
2019	2.3%	0.9%	4.4%
2020	0.9%	0.6%	4.7%
2021	1.7%	0.4%	4.5%

TD Bank Group does not project a contraction in the Pennsylvania economy, but does project a low growth rate of 0.9%. With that low of a rate, a contraction is well within the margin of error, but the positive projection should be encouraging. Employment growth is predicted to be fairly stagnant unfortunately, but the unemployment rate is projected to stay below 5%, which would still be below the average unemployment rate of 6.3% for Pennsylvania over the last 40 years [21].

Government Intervention

Both the Pennsylvania State government as well as the US Federal Government have stepped in to provide aide during the crisis. Below will be a brief synopsis of those programs.

PA Relevant Orders and Programs

Non-Life-Sustaining Businesses – Implemented March 19th

Governor Wolf ordered all non-life-sustaining businesses in Pennsylvania to close their physical locations. Businesses have the opportunity to request a waiver of this policy by submitting a form. Information here: <https://www.pa.gov/guides/responding-to-covid-19/#StayatHomeOrder>

COVID-19 Working Capital Access Program – Implemented March 25th

A loan program offered by the PA Industrial Development Authority and is aimed at providing loans to small businesses (those with less than 100 workers) in Pennsylvania to mitigate the damage created by the COVID-19 outbreak. Loans of up to \$100,000 will be made available at a 0% interest rate for most businesses (2% for agricultural producers). Information here: <https://dced.pa.gov/programs/covid-19-working-capital-access-program-cwca/>

PA Department of Community and Economic Development Loans

While not a new program, low interest loans and lines of credit are available through the PA Department of Community and Economic Development. Loan amounts and interest rates vary

based on the applicant. Information here: <https://dced.pa.gov/programs/pennsylvania-industrial-development-authority-pida/>

US Relevant Orders and Programs

US Small Business Administration Programs

The US Small Business Administration (SBA) is offering a variety of guidance and loan resources for small businesses. Information here: <https://www.sba.gov/page/coronavirus-covid-19-small-business-guidance-loan-resources>

Federal Income Tax Filing and Payment Deadline Extension

The Federal Government has extended the income tax filing and payment deadline past the traditional April 15th due date. Individuals and businesses now have until July 15, 2020 to file their Federal income tax. This is only applicable to Federal income tax, not state or local.

Information here: <https://www.irs.gov/newsroom/payment-deadline-extended-to-july-15-2020>

CARES Act

The Federal Government approved the CARES Act, which would allow for small businesses to access loans through the SBA, provides a stimulus check for individuals making less than \$99 thousand per year, and offers cash to industries in distress due to COVID-19. The wording of the bill can be found here: <https://www.congress.gov/116/bills/s3548/BILLS-116s3548is.pdf>

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