| **Mini Project Semester 7** |
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| **PROJECT TITLE: Covid-19 Impact Analysis using Python** |
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| **DATE OF SUBMISSION OF THIS REVIEW: 08Nov2022** |
| 1. **Title of paper: Data analytics to evaluate the Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy** |
| 1. **Author/s: Nuno Fernandes** |
| 1. **Year of publication:** 2020 |
| 1. **Journal name/ conference name:**  Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy |
| * 1. **Abstract of paper:**   This report discusses the economic impact of the Coronavirus/COVID-19 crisis across industries, and countries. It also provides estimates of the potential global economic costs of COVID-19, and the GDP growth of different countries.  The current draft includes estimates for 30 countries, under different scenarios.  The report shows the economic effects of the outbreak are currently being underestimated, due to over-reliance on historical comparisons with SARS, or the 2008/2009 financial crisis.  At the date of this report, the duration of the lockdown, as well as how the recovery will take place is still unknown. That is why several scenarios are used. In a mild scenario, GDP growth would take a hit, ranging from 3-6% depending on the country. As a result, in the sample of 30 countries covered, we would see a median decline in GDP in 2020 of -2.8%. In other scenarios, GDP can fall more than 10%, and in some countries, more than 15%.  Service-oriented economies will be particularly negatively affected, and have more jobs at risk. Countries like Greece, Portugal, and Spain that are more reliant on tourism (more than 15% of GDP) will be more affected by this crisis. This current crisis is generating spillover effects throughout supply chains. Therefore, countries highly dependent on foreign trade are more negatively affected. The results suggest that on average, each additional month of crisis costs 2.5-3% of global GDP**.** |
| * 1. **Summary of paper:**   This report discusses the economic impact of the COVID-19 crisis across industries, and countries. It discusses the economic channels through which economic activity will be impacted. And the asymmetric results across countries and industries. It also attempts a rough estimate of the potential global economic costs of COVID-19 under different scenarios.  The COVID-19 outbreak started in December 2019 in Wuhan city in China. It continues to spread across the world. At the time of the first draft of this report, almost 200,000 cases of the virus had been recorded worldwide. As of this current version, the total has risen to above one million. And more than 100,000 have died.  While some countries have been able to treat the reported cases effectively, it is uncertain where and when new cases will emerge. Every day more cases are reported, and new countries enter the World Health Organization's (WHO) list of areas where the virus has been reported. It seems, however, as if the cases reported from China have peaked, and are now falling. The opposite trends are seen in Europe and America. Given the public health risk, the WHO has declared an emergency of international concern.  In a strongly connected and integrated world, the impacts of the disease go way beyond mortality. As such, governments around the world have been preparing contingency plans, and aid packages to sustain their economies.  In China, we have seen severe lockdowns. This has led to a decrease in consumption, and interruptions to production. Overall, the functioning of global supply chains has been disrupted, affecting companies across the globe. Millions of people could lose their jobs over the coming months. In addition, every day we hear worrying news about more companies shutting down operations, revising estimates, or announcing layoffs. Consumers have also changed their consumption patterns, resulting in shortages of many goods in supermarkets around the world. Global financial markets have registered sharp falls, and volatility is at levels similar, or above, the financial crisis of 2008/9.  In the middle of all this turbulence, the International Monetary Fund (IMF) has developed some new estimates for growth in 2020 (Feb 2020). In its revised estimates, the IMF expects China to slow down by 0.4 percentage points, as well as a slowdown of global growth by 0.1 percentage points. The OECD also revised their estimates in early March. It forecasted global economic growth falling to 2.4% for the whole year, compared to 2.9 % in 2019. I believe both estimates will be proven wrong, and will likely be revised down in the coming months.  There is still time for global policy makers to have a coordinated policy response to the virus and its economic impacts. However, time is running out. Post-World War II, the average recession has increased the unemployment rate by about 2 percentage points. We live now in a very different world compared with those that faced previous crises. Therefore, comparisons are dangerous, and prone to errors. This time, we are facing a combined demand and supply shock, and economic tools are limited. In addition, central banks exhausted their firepower during the good times. There is almost no room for monetary stimulus to help sustain the coming risks. Overall, the potential impacts of this crisis are larger than any previously seen in history.  This report first discusses why comparisons with prior events are not possible. Then, it summarizes the existing news and reliable data that can guide any forecast. Within this, this report concludes that there will be a very asymmetric impact across sectors. Depending on the economic structure of each country, some will be more affected than others. For instance, countries with more service-oriented economies will be more affected, and have more jobs at risk. This report then outlines some possible scenarios, and their impact on economic prospects. Finally, it concludes with a summary of the findings and some policy implications. |
| **Key points**   * 1. **points that are covered in paper:** * Economic crisis:   The economic shock posed by the current COVID-19 crisis (and a confidence interval), expressed as a percentage of GDP for each country. They provide an estimate of the overall economic cost of the crisis under many assumptions (previous sections). Chief among them, in this scenario, the shutdown is assumed to be 1.5 months, with May being a gradual recovery month.  In the base scenario, in which the economic situation would be normalized by the end of May, the economic impact of the crisis ranges from 3.5 to 6% depending on the country. For instance, in the U.S., the crisis is expected to cost nearly 4% of its GDP. Overall, for all countries analyzed, an average economic impact of -4.5% of GDP is expected (median = -4.4%). The model takes into account the different compositions of GDP in different countries. For instance, the higher the weight of tourism, the higher the impact of the crisis. In addition, supply chain disruptions, and a steep fall in global trade, exert further pressure on countries highly dependent on foreign trade.   * Recession:   A global recession now seems inevitable. But how deep and long the downturn will be depends on the success of measures taken to prevent the spread of COVID-19, the effects of government policies to alleviate liquidity problems in SMEs and to support families under financial distress. It also depends upon how companies react and prepare for the restart of economic activities. And, above all, it depends on how long the current lockdowns will last.  At the date of this report, the duration of the lockdown, as well as how the recovery will take place is still unknown. That is why several scenarios are used. In the base scenario, GDP growth would take a hit, ranging from 3-6% depending on the country. As a result, in the sample of 30 countries covered, we would see a median decline in GDP in 2020 of -2.8%. In other scenarios, GDP can fall more than 10%, and in some countries, more than 15%.   * Coronavirus:   The COVID-19 crisis spread rapidly throughout the world last month. We are facing a totally new type of crisis. In this case, the health risk (actual mortality and infection rates) is not necessarily correlated with the economic risk to the global economy. Historically, global trade has allowed countries to share risk. This time, this channel is not likely to help much.   * COVID-19:   The COVID-19 outbreak started in December 2019 in Wuhan city in China. It continues to spread across the world. At the time of the first draft of this report, almost 200,000 cases of the virus had been recorded worldwide. As of this current version, the total has risen to above one million. And more than 100,000 have died.  While some countries have been able to treat the reported cases effectively, it is uncertain where and when new cases will emerge. Every day more cases are reported, and new countries enter the World Health Organization's (WHO) list of areas where the virus has been reported. It seems, however, as if the cases reported from China have peaked, and are now falling. The opposite trends are seen in Europe and America. Given the public health risk, the WHO has declared an emergency of international concern.  In a strongly connected and integrated world, the impacts of the disease go way beyond mortality. As such, governments around the world have been preparing contingency plans, and aid packages to sustain their economies.   * Financial crisis:   Comparisons with other global crises, like the 2008 financial crisis, are not possible. This time we are facing a number of new challenges, which prevent simple comparisons with the past:  o It is a global pandemic  o It is not focused on low-middle income countries  o Interest rates are at historical lows  o The world is much more integrated  o This current crisis is generating spillover effects throughout supply chains  o We have simultaneously destruction of demand and supply Electronic copy available at: https://ssrn.com/abstract=3557504  ***# Relevant business and economic news and data***  The above-mentioned facts can be seen in the light of recent business events. Unfortunately, the economic impact of the current health crisis is being felt across sectors and countries. This is a small sample of relevant events over the past month:  o Car manufacturers, such as Volkswagen and Ferrari, suspend production in Europe  o Sectors affected by the lockdown—transport, entertainment, retail, hotels and restaurants—account for a quarter of Italian GDP  o Euro 2020, Tokyo Olympic Games, postponed to 2021  o Tourist destinations like Paris, Madrid, Venice and Rome are deserted  o Trade fairs and events are canceled  o In the U.S., job losses reached an unprecedented high.  o Cancellations of public gatherings and sporting events  o Cruise operators canceling cruises  o Airlines have started by grounding their Airbus A380s fleets. Later, they grounded their whole fleet  o Airlines asking employees to take two months unpaid leave  o NBA, football leagues, Formula 1 suspended until further notice  o Maersk canceled 50 sailings over coronavirus  o More than 10 million people have already lost their jobs in the U.S.  o Canada’s Cineplex Inc. is closing all of its 165 movie theaters  o McDonald’s closes seating areas in the U.S.  o Lufthansa reduces 90% of its long range flights and cancels more than 23000 flights until the end of April  o Media groups, and TV networks are facing sudden drops in ad revenue  o Lockdown of Manila (13 million people in the metropolitan area)  o Amazon and Facebook have issued lower estimates of ad revenue  o Germany has offered companies "unlimited" loans to stop them from collapsing  o Airbus suspended production in France and Spain  o Gucci and Hermes, luxury goods companies, are closing all their manufacturing sites  o Italian shipyard Fincantieri has asked its workers to use their annual vacation time  o 145 drivers have been laid off at the Port of Los Angeles, as ships from China stopped arriving  o Norwegian Air to cancel 85% of flights and lay off 90% of staff  o German tourism giant TUI has made a request for state aid  o MGM closes all U.S. casino resorts  o Switzerland is open only to citizens, residents, and commuters  o Trading on the NYSE halted several times over the past month, as circuit breakers kept being broken  o Swiss watch manufacturers are facing disrupted supplies of components  o Borders are being reinstated within the EU   * Financial impact:   In China, we have seen severe lockdowns. This has led to a decrease in consumption, and interruptions to production. Overall, the functioning of global supply chains has been disrupted, affecting companies across the globe. Millions of people could lose their jobs over the coming months. In addition, every day we hear worrying news about more companies shutting down operations, revising estimates, or announcing layoffs. Consumers have also changed their consumption patterns, resulting in shortages of many goods in supermarkets around the world. Global financial markets have registered sharp falls, and volatility is at levels similar, or above, the financial crisis of 2008/9.  In the middle of all this turbulence, the International Monetary Fund (IMF) has developed some new estimates for growth in 2020 (Feb 2020). In its revised estimates, the IMF expects China to slow down by 0.4 percentage points, as well as a slowdown of global growth by 0.1 percentage points. The OECD also revised their estimates in early March. It forecasted global economic growth falling to 2.4% for the whole year, compared to 2.9 % in 2019. I believe both estimates will be proven wrong, and will likely be revised down in the coming months.  There is still time for global policy makers to have a coordinated policy response to the virus and its economic impacts. However, time is running out. Post-World War II, the average recession has increased the unemployment rate by about 2 percentage points. We live now in a very different world compared with those that faced previous crises. Therefore, comparisons are dangerous, and prone to errors. This time, we are facing a combined demand and supply shock, and economic tools are limited. In addition, central banks exhausted their firepower during the good times. There is almost no room for monetary stimulus to help sustain the coming risks. Overall, the potential impacts of this crisis are larger than any previously seen in history.   * 1. **points that are not covered in paper:**   ***# Comparisons with SARS are not valid***  In 2002/3 the outbreak of severe acute respiratory syndrome (SARS) spread from Guangdong, in China, to other Asian countries. By the time it was contained (summer of 2003), more than 8,000 people had been infected, and over 900 people had died (WHO). It led to a 0.5 to 1 percentage point reduction in China’s growth in 2003. Overall, the cost of SARS to the global economy is estimated to have been $54 billion, according to the World Bank.  There is still plenty of uncertainty about COVID-19. The available data suggests it is more contagious than SARS, similar to the Avian flu. On the other hand, COVID-19 has a much lower mortality rate (between 2-4%) compared to SARS (10%). And both are much lower than the Avian flu (60%).  Despite sharing similarities from a medical perspective (both are coronavirus infections), their economic impacts are bound to be very different. As such, comparisons with SARS have to be properly adjusted:   * China represented 3% of the world economy in 2003. Now it is above 16%. Nowadays, any shock to Chinese activity is strongly felt in markets around the world, in all different sectors. * China is currently the world’s largest importer and exporter. In many individual industries, China is the main supplier of parts. So, countries that rely on China for intermediate inputs are strongly affected. Companies like Apple and Nike have already admitted being affected by this. * China is also, in many industries, the main purchaser of global goods and services. * Since 2014, China has been the largest source country of international tourism (World Tourism Organization). That means that many countries' exports of services depend substantially on Chinese consumers. * The world economy is much more integrated than it was 15 years ago. So economic disruption in one location has much larger spillover effects. * China represented approximately 40% of the world's growth in 2019. In 2003, China slowed down 1% of its growth was not noticeable. Nowadays, it has a much bigger impact on global growth. |
| * 1. **Scope for work:**   The most recent data from the National Bureau of Statistics showed how the majority of analysts were wrong and underestimated the impact of the crisis. This recently released data indicated that industrial output fell, in the first two months of 2020, by more than 13.5%. The median forecast of analysts polled by Reuters predicted a gain of 1.5%.  Similarly, investment in fixed assets fell 25% year-on-year. Here, analysts were forecasting 2.8% growth (compared with 5.4% growth in the prior period).  Chinese consumers respected the lockdowns and their authorities' recommendations. They were fearful of the virus, and thus moved away from shopping malls, restaurants and movie theaters. As a result, retail sales collapsed by 20%, compared with a forecast of 0.8% by analysts (and very far from the +8% growth in December).  Data released on March 16, 2020 indicated that 5 million people in China lost their jobs in January and February (CNBC). But it's likely the figure will grow to more than 9 million (Economist Intelligence Unit).  Infrastructure investment was also down in the first two months (30% from a year earlier). This is despite local governments' paying for a number of projects through their bonds sold since the start of the year ($140 billion).  It is important to know that 2020 also marks the end of China’s current five-year development plan. Within this plan, there was an objective of doubling the size of the Chinese economy by 2020 (relative to 2010). In order to do that, growth above 6% was needed for 2020. |
| **Guide Remark:** |