

The Impacts of the Coronavirus on the World Economy

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We present a formal analysis of the macroeconomic impacts of the COVID-19 pandemic in the U.S., China and the rest of the world. The study considers a comprehensive list of causal factors affecting the impacts, including: mandatory closures and the gradual re-opening process; decreased services trade due to reduced movement of natural persons (mode 4, GATS); the decline in workforce due to morbidity, mortality and avoidance behavior; the suspension of some ordinary health care services and subsequent increase in demand for COVID-related health care; decreased demand for public transportation and leisure-related activities; increased precautionary savings; potential resilience through telework; increased demand for communication services; increased pent-up demand; and government stimulus.

We apply a global computable general equilibrium (CGE) model, a state-of-the-art economy-wide modeling technique based on the GTAP model and updated for supply chains and dynamics. It traces the broader economic ramifications of individual responses of producers and consumers through supply chains both within and across countries. Our model closure is a very restrictive short run closure, in which all factors of production are immobile across sectors and wages are exogenous, leading to unemployment, which is then gradually eliminated over time as the pandemic subsides and the recovery process begins. We decompose the results by the causal factors listed above, including the mandatory closures, avoidance, decline in workforce, etc., that have driven the decline in economic activity world-wide, as well as those that are expected to assist in the recovery process – namely pent-up demand, the fiscal stimulus, resilience, and the discovery and dissemination of the vaccine.

Data on the severity and time-path of business closures, infections and related conditions have been collected and updated for the US and many other countries. In preliminary work, we examine three scenarios, ranging from a relatively moderate event to a disaster. These results suggested that the net U.S. GDP losses from COVID-19 would range from \$3.2 trillion (14.8%) to \$4.8 trillion (23.0%) in a 2-year period for the three scenarios. U.S. impacts were estimated to be higher than those for China and the ROW in percentage terms. The major factor affecting the results in all three scenarios is Mandatory Closures and the Partial Reopenings of businesses. These alone would have resulted in a 22.3% to 60.6% decrease in U.S. GDP across the scenarios. Pent-up Demand, generated from the inability to spend during the Closures/Reopenings, is the second most influential factor, significantly offsetting the negative impacts stemming from other causal factors. As more data have become available on mandatory closures, avoidance, infections, telework, the dissemination of the vaccine, etc., we have been updating our main scenarios and are now concentrating on examining the recovery process, including the impact of various proposed fiscal stimulus packages.

Initial work has been published in the following two papers and updates to this work will be presented at the conference:

Walmsley, T. L., A. Rose and D. Wei, (2021). “The Impacts of the Coronavirus on the Economy of the United States”, *Economics of Disasters and Climate Change*, 5, 1-52 [https://doi.org/10.1007/s41885-020-00080-](https://doi.org/10.1007/s41885-020-00080-1)

Walmsley, T. L., A. Rose and D. Wei, (2020). "Impacts on the U.S. Macroeconomy of Mandatory Business Closures in Response to the COVID-19 Pandemic", *Applied Economics Letters*, <https://www.tandfonline.com/doi/full/10.1080/13504851.2020.1809626>