

A Review of the Impact of the COVID-19 on the Macroeconomy

Wenjia Han ^{1,*}, Kaiyue Wang ^{2,†}, Yichen Zhang ^{3,†}

¹ University of Washington, Seattle

² Beijing Institute of Technology

³ Simon Fraser University, Vancouver

*Corresponding author. Email: whan1103@uw.edu

†These authors contributed equally.

ABSTRACT

The outbreak of the new crown pneumonia epidemic at the end of 2019 had a huge impact on the world economy. This article is based on the actual economic development at this stage, combined with the research results on the impact of the epidemic on the economy, and the existing research results from the macroscopic and economic forecasts. After sorting it out, the research found that, on the one hand, the huge impact of the outbreak on the macro economy cannot be ignored. It will take longer for the more severely affected countries to return to their previous economic conditions, especially in terms of unemployment and employment opportunities. On the other hand, personal consumption has shown a sharp decline, while economic flows have been significantly reduced, especially for some large-scale economic sectors, such as aviation and entertainment during the epidemic. In order to effectively stimulate economic recovery, the government departments need to adopt active and effective measures to prevent and control the epidemic, and increase support for small and medium-sized enterprises in terms of the economy at the same time.

Keywords: Macroeconomics, Impact, COVID-19

1. INTRODUCTION

1.1. Research Background

World's economy has been damaged by the COVID-19 pandemic in many aspects. A large number of small firms and entrepreneurs were forced to shut down their businesses due to the high risk of infection. The spread of COVID-19 virus has been affecting national economics and governments to keep updating new policies that fit the current situation. 2020 is also a difficult year for job seekers. The unemployment rate in the United States has changed from 3.7% in 2019 to 8.9% in 2020. Despite in some economies like China, and Canada, the governments have introduced policies of compulsory vaccination of individuals, the status of economic recovery still remains unknown to us. Researchers have shown that lock-downs in response to the pandemic caused productivity to decrease. The lock-downs have disrupted supply chains, manufacturing, production, and markets, impacting many SDGs negatively, mostly in the short term. For example,

disrupted food and agriculture supply chains exacerbated food insecurity and decreased agricultural productivity (SDG 2), and increased food losses (SDG 12) [1]. Due to people tend to cut their consumption and work in order to reduce their chance of being infected, under epidemic circumstances. This may lower the severity of the epidemic effectively. However, imbalance will appear in competitive markets because people do not fully contribute to the economy. As a result the dilemma would be controlling the spread of the pandemic might interrupt normal economical activities at the same time. Therefore, how to strike a balance between guaranteeing citizens' work safety and economic recovery will become a concern for the government and policy makers.

However, these effects are not permanent. It can be recovered to normal standards more rapidly with the help of government employment subsidies, or policies that recall workers to their previous positions. Therefore, this article believes that policy makers play an extremely important role in economic recovery and citizen cooperation in the post-epidemic era. The

estimated time of recovery will be predicted, and whether in some areas or some particular industries recovery will happen more rapidly will be discussed as well.

1.2. Research Significance and Framework

This research aims to discuss the impact of the new crown pneumonia outbreak on the economy from a macroeconomic perspective, and analysis the necessity and perspective of similar research from the existing theoretical basis. In order to analysis the issues related to this topic, this article sorts out the existing research results on the impact of the epidemic on the macroeconomics, and combines the reality of economic development to make constructive suggestions for effective prevention and control of the epidemic and stimulating economic development in the future. This research also provides some feasible and effective solutions for enterprises or countries to maintain

sustainable economic development in the post-epidemic era. The research framework of this article is as follows. The first part is the introduction, which mainly includes the research background and research significance of the article. The second part is a literature review, combing and analyzing the existing research results on the impact of the epidemic on the macroeconomics, and the third part is based on the thinking of existing research results and puts forward the viewpoints of this article.

2. LITERATURE REVIEW

Based on the existing research results, this article attempts to sort out the literature from three aspects, including the prediction of the epidemic on the macro economy, the measurement of the impact of the epidemic on the macroeconomy, and the study of economic recovery in the post-epidemic era. Trying to systematically summarize the existing research results.

Table 1. Existing research classification status table

Number	Research perspective
1	Prediction of the Impact of the Epidemic on the Economy
2	Research on the Measurement of the Impact of the Epidemic on the Macroeconomics
3	Research on Economic Recovery in the Post-Epidemic Era
4	Research on how to stay innovative in the Post-Epidemic Era

2.1. Prediction of the Impact of the Epidemic on the Economy

The article Macroeconomic forecasting in the time of COVID-19 was written by Primiceri and Tambalotti is meant to address the changes that have taken place to the economy of the United States following the COVID-19 pandemic [2]. The main research problem that is addressed by the article is the assumptions of the time it will take for the economy of the United States to resume its previous booming before the development of the pandemic. There are several assumptions that the articles have taken into consideration when coming up with the effects that the changes are likely to have on the economy. The projections of the article are that the economy of the country will not get back to its original point before COVID-19 immediately after the pandemic especially when it comes to employment and job availability. Moreover, the consumption of the products will not be the same as it was previously hence there are some significant changes that the article suggests will take place based on the assumptions that are made in the article. The recovery of the economy cannot be an instant thing hence there must be a formula that will be followed for the economy to slowly grow back to its previous state, an idea that is shared by Boissay and Rungcharoenkitkul [3]. The personal expenditures of individuals were reduced by a very large percentage and several of the major sectors of the economy such as

entertainment and air transport were brought to a halt in the wake of the pandemic in 2020 [2]. The reduction was tremendous and it would take a lot more time for the recovery of the economy.

The basic reasoning of the articles makes it clear that the issue dealt with here is not simple since there are several factors that have to be put together to come up with a probable formula for dealing with the effects of the pandemic. Wälde and Donsimoni in this part start by stating the sectors of the economy that have been affected and the ways that have been affected by the pandemic. The authors were very specific to the sectors that form the largest part of the economy and the impacts that they have on the economy based on the effects that the pandemic has had on them. There is a lot of importance that the author placed on the policy development that will take place after the pandemic since it will determine the direction that the economy of the United States will take. It is the reason why forecasting the economy is important according to the authors since it will determine the policy changes that need to take place to deal with the pandemic. However, the authors acknowledge how it is difficult to deal with such an issue since the pandemic was unprecedented and the magnitude of the effects that it has had on the economy is so massive. The authors acknowledge the fact that the assumptions that are made may make the forecasting that result from them. Hence, the policies to be way off the mark but will provide a great guideline

for the recovery of the economy [2]. The authors proposed that two approaches can be used to forecast the macroeconomic effects of the COVID-19 shock on the economy. The first approach is the model of the dynamics of the pandemic by the use of explicit economic assumptions. The other approach is the application of time-series data and uses it to learn the future effects that the pandemic may have on the economy. The approach is to learn from the effects that the previous pandemics have had on the economy and what was done to recover from the effects. However, the second approach is immediately castigated as one that is not viable based on the fact that there is no recent in history that can be used to determine the effects of the economy on the magnitude of the pandemic as Eichenbaum, Rebelo and Trabandt did [4]. The closest data can be obtained from the occurrence of the Spanish Flu which killed around 40 million people worldwide, corresponding to 2.1 percent of the world's population at the time [5]. However, it took place many years ago hence the data may not be relevant to the current issue since the time difference is so massive. It only leaves the researchers with the application of more structured approaches as the main ones that can be used to approach the problem. The authors were critical enough in this case since there are so many economic differences that can be seen from the time of the Spanish flu to the current times and the problems faced. Hence using data from the Spanish flu will not yield the expected result.

2.2. Research on the Measurement of the Impact of the Epidemic on the Macroeconomy

The authors did a good job in the modification of the formula for calculating the long term effects of the pandemic since the long term effects are different from the short-term effects of the pandemic. The short term effects of the pandemic are straightforward and can be seen from the onset of the problem. The shock of the pandemic led to the provision of important data that would be very easy to analysis based on the different changes that the macroeconomic sector has gone through by the time it was March 2020. It was very evident that the same formula cannot be used when it comes to the long term effects since there are different dynamics that have to be taken into considerations. The idea of making different assumptions that would help modify the formula for forecasting is important since the current and immediate effects that the pandemic has had on the current status of the economy. The apparent effect of the pandemic on the economy was based on the shut-downs of different sectors of the economy. The effects were easy to identify from the other disturbances that the economy has faced in the past since the other disturbances were of lower magnitudes [6]. The authors were very right to identify the problems and develop the basic formula that would be used to determine the

effects that the pandemic has had on the economy. Forecasting would only need the modification of the formula based on the other factors that would come into play. The authors were very right to modify the formula to include the virus shock since it would be very important in determining the future impacts of the virus after the initial effect is dealt with. The formula is very comprehensive since it contains a lot of factors and various determinants that can change in one way or another but with the overall effect of helping improve the predictability of the effects of the pandemic on the economy. The representation of the initial effects concerning the most probable effect made it easy for the future impacts of the pandemic to be determined from the previous effects that the pandemic has had. One thing that the authors were very keen on is the factors that were to be included in the assumptions that are made depending on the future probable changes that would take place. The assumptions were important in determining the exact effects. Similar assumptions can be seen in the formula that was designed by the National Bureau of Economic Research.

2.3. Research on Economic Recovery in the Post-Epidemic Era

As of today, the predictive effects and available data of these theoretical models have played an important role in the current actual epidemic. The first-order predictions produced by these models are that when the world's economies are facing the new crown pneumonia epidemic, they will drastically reduce their large-scale economic activities in a short period of time. After the epidemic is effectively controlled, a strong recovery will occur. Now we look at the United States and other economies, clearly confirming the qualitative economic forecasts of the model. The author compares the rate of GDP decline in the United States without control which is similar to the simulated output in the model [7]. Another prediction is that economic activity should shrink before the government takes immediate measures or policies to curb activity. The author has collected a large amount of mobility data and consumption micro data, and we can find that the prediction of the model is consistent with the data provided by Atkeson. The model also predicts that if a successful vaccine is not developed or the vaccination campaign fails, the death toll will reach between 0.5 and 1.5 million. The number of deaths is related to the containment policy adopted by the government. As of June 2021, the total number of deaths in the United States has exceeded 630,000. This number corresponds in Barro, Ursúa, and Weng's regression analysis to declines in the typical country by 6 percent for GDP and 8 percent for private consumption [8]. Obviously, this number is within the forecast range. The author also explained to a certain extent that the ongoing new crown vaccination has a positive impact on suppressing deaths [9]. The model

also predicts the duration of the epidemic, and the model data shows that its wave and time limit are between one and a half to two years. With the current decline in the number of patients and effective vaccination, without the occurrence of sudden large-scale infections, the effective alleviation of the epidemic will be just around the corner. This depends on the speed of vaccination and the face of how strong the vaccine can answer when another emergence of mutant COVID-19 virus appears. For the slow rate of vaccine inoculation across regions also imperils the outbreak of future infections [10]. In the face of actual data, the prediction results calculated by these models are reasonable.

2.4. Research on how to stay innovative in the Post-Epidemic Era

Propelled by the IT revolution and technological development in the 1990s. The societies have transformed into a new era using advanced software tools to efficiently perform tasks. And more and more firms started to realize the importance of innovation. While during the epidemic, R&D processes that require on field works to be done were not able to make any progress due to the high risk of doing researching works. However, we've seen many companies changing their office activities to online forms, more and more pick-up and delivery services are made possible for the convenience of customers. Innovation is thriving in these uncertain times, but they're masking the greater story: the story of hidden innovation [9]. By hidden innovation, the author means that those new ways of delivering works or thoughts to others that may lead to more proclivities. For example, instead of standing on-stage and setting a definite direction, leaders are sharing what they know and what they don't know [9]. The author have also pointed out that better acceptance of these hidden innovations for leaders will result in positive outcomes. And companies should encourage these kind of innovation from happening. Now that the epidemic is relatively stable in many areas of the world, new challenges are brought to firms and societies. How to stay innovative may be a dependent factor for firms to acquire a leading position in the industries. Which shows the impotence of a good innovation policy.

3. CONCLUSION

This article aims to re-examine and study those academic models and predictions based on scholars' macroeconomic analysis and predictions after the outbreak, combined with current data and facts. Based on the existing research results, in terms of the impact and prediction of the epidemic on the macro economy, the impact of the outbreak of the new crown pneumonia epidemic on the macro economy cannot be ignored. It is not only reflected in employment, but also in the development of business operations. The outbreak of the

epidemic will lead to a decline in the national economy to varying degrees. It is difficult for countries that have been severely affected by the epidemic to return to their previous state in a short period of time, especially in terms of employment scale and employment opportunities. In addition, the epidemic will have a direct weakening effect on personal consumption, personal consumption levels will decline sharply, and regional economic flows will slow down significantly. Some large economic sectors such as aviation and entertainment have been severely shut down. In terms of promoting economic recovery in the post-epidemic era, in addition to adopting active policies to prevent and control the epidemic, local governments also need to provide policy support for enterprises and individuals, such as providing preferential tax policies for small and medium-sized enterprises and providing consumer vouchers for individuals. Adjust the economy from the two aspects of supply and demand to maintain the sustainable and healthy development of the country and society.

REFERENCES

- [1] Adhikari, J., Timsina, J., Khadka, S. R., Ghale, Y., & Ojha, H. (2021). COVID-19 impacts on agriculture and food systems in Nepal: Implications for SDGs. *Agricultural Systems*, 186, 102990.
- [2] Primiceri, G. E., & Tambalotti, A. (2020). *Macroeconomic Forecasting in the Time of COVID-19*. Manuscript, Northwestern University, 1-23.
- [3] Boissay, F., & Rungcharoenkitkul, P. (2020). *Macroeconomic effects of COVID-19: An Early Review* (No. 7). Bank for International Settlements.
- [4] Eichenbaum, M. S., Rebelo, S., & Trabandt, M. (2020). *The macroeconomics of epidemics* (No. w26882). National Bureau of Economic Research.
- [5] Arnold, R, J De Sa, T Gronniger, A Percy and J Somers (2006): "A potential influenza pandemic: possible macroeconomic effects and policy issues", report to the Congressional Budget Office.
- [6] Ludvigson, S. C., Ma, S., & Ng, S. (2020). *COVID-19 and the macroeconomic effects of costly disasters* (No. w26987). National Bureau of Economic Research.
- [7] Wälde, K., & Donsimoni, J. R. (2014). *Advanced Macroeconomics*.
- [8] Barro, R, J Ursua and J Weng (2020): "The coronavirus and the Great Influenza Pandemic: lessons from the 'Spanish flu' for the coronavirus"

potential effects on mortality and economic activity”, NBER Working Paper, no 26866.

- [9] Robyn Bolton. (2021). How To Continue Innovating Post-Pandemic. Forbes.
- [10] Sulochan GC & Ashok Khanal & Atmika Paudel & Vijay S. GC & Aashis Khanal & Suresh Panthee (2021). Comparative analysis of COVID-19 case fatality rate between two waves in Nepal.