Economics in the Time of COVID-19

Edited by Richard Baldwin
and Beatrice Weder di Mauro

A VoxEU.org Book

CEPR Press

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Contents

3 The economic impact of COVID-19

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The COVID-19 outbreak was triggered in December 2019 in the city of Wuhan, which is in the Hubei province of China. The virus continues to spread across the world. Although the epicentre of the outbreak was initially China, with reported cases either in China or in travellers from the country, cases now are being reported in many other countries. While some countries have been able to effectively treat reported cases, it is uncertain where and when new cases will emerge. Amidst the significant public health risk COVID-19 poses to the world, the World Health Organization (WHO) has declared a public health emergency of international concern to coordinate international responses to the disease. It is, however, currently debated whether COVID-19 could potentially escalate to a global pandemic.

In a strongly connected and integrated world, the impacts of the disease beyond mortality (those who die) and morbidity (those who are unable to work for a period of time) has become apparent since the outbreak. Amidst the slowing down of the Chinese economy with interruptions to production, the functioning of global supply chains has been disrupted. Companies across the world, irrespective of size, that are dependent upon inputs from China have started experiencing contractions in production. Transport being limited and even restricted among countries has further slowed global economic activities. Most importantly, some panic among consumers and firms has distorted usual consumption patterns and created market anomalies. Global financial markets have also been responsive to the changes and global stock indices have plunged.

1 We gratefully acknowledge financial support from the Australia Research Council Centre of Excellence in Population Ageing Research (CE170100005).

In McKibbin and Fernando (2020), we simulate a global economic model to explore seven scenarios regarding the spread of COVID-19. The G-cubed model is a hybrid of dynamic stochastic general equilibrium (DSGE) models and computable general equilibrium (CGE) models which was developed by McKibbin and Wilcoxen (1999, 2013) and extended to the G20 countries by McKibbin and Triggs (2018). Using this model, we follow the approach to evaluating the economics of SARS (Lee and McKibbin 2003) and pandemic influenza (McKibbin and Sidorenko 2006) to explore a range of different scenarios for the spread of COVID-19. Given a range of epidemiological assumptions, we create a set of filters that convert the epidemiological assumptions into economic shocks to reduced labour supply in each country (mortality and morbidity), rising costs of doing business in each sector (including disruption of production networks in each country), a reduction in consumption due to shifts in consumer preferences over each good from each country (in addition to those changes generated by the model based on changes in income and prices), a rise in equity risk premia on companies in each sector in each country (based on exposure to the disease), and increases in country risk premia based on exposure to the disease as well as vulnerabilities to changing macroeconomic conditions.

Scenarios 1 to 3 (called S01, S02 and S03) assume the epidemiological events are limited to China. The economic impact on China and the spillovers to other countries – through trade, capital flows and changes in risk premia in global financial markets – are determined by the model. Scenarios 4 to 6 (S04, S05 and S06) are the pandemic scenarios where the epidemiological shocks occur in all countries to differing degrees. Scenarios 1 to 6 assume the shocks are temporary. Scenario 7 (called S07) is a case where a mild pandemic is expected to recur each year for the indefinite future.

Table 1 outlines the assumptions in the seven scenarios.

Table 2 shows the impact on populations in different regions under each scenario. The table shows that for even the lowest of the pandemic scenarios (S04), there are estimated to be around 15 million deaths globally. In the US, the estimate is 236,000 deaths (for comparison, in a regular influenza season in the US around 55,000 people die each year).

Tables 3 provides a summary of the overall GDP loss for each country/region under the seven scenarios. It shows the change in GDP in 2020 expressed as the percentage change from the baseline. Further detailed results can be found in McKibbin and Fernando (2020). The table illustrates the scale of the various pandemic scenarios on reducing GDP in the global economy. In the case where COVID-19 develops into a global pandemic, our results suggest that the cost in lost economic output begins to escalate into the trillions of dollars.

Table 1 Scenario assumptions

Scenario	Countries affected	Severity	Attack rate for China	Mortality rate China	Nature of shocks	Shocks activated	Shocks activated
						China	Other countries
1	China	Low	1.0%	2.0%	Temporary	All	Risk
2	China	Mid	10.0%	2.5%	Temporary	All	Risk
3	China	High	30.0%	3.0%	Temporary	All	Risk
4	Global	Low	10.0%	2.0%	Temporary	All	All
5	Global	Mid	20.0%	2.5%	Temporary	All	All
6	Global	High	30.0%	3.0%	Temporary	All	All
7	Global	Low	10.0%	2.0%	Permanent	All	All

Source: Table 3 in McKibbin and Fernando (2020).

Table 2 Impact on populations under each scenario

Country/region	Population (thousands)	Mortality in first year (thousands)						
		S01	S02	S03	S04	S05	S06	S07
Argentina	43,418	-	-	-	50	126	226	50
Australia	23,800	-	-	-	21	53	96	21
Brazil	205,962	-	-	-	257	641	1,154	257
Canada	35,950	-	-	-	30	74	133	30
China	1,397,029	279	3,493	12,573	2,794	6,985	12,573	2,794
France	64,457	-	-	-	60	149	268	60
Germany	81,708	-	-	-	79	198	357	79
India	1,309,054	-	-	-	3,693	9,232	16,617	3,693
Indonesia	258,162	-	-	-	647	1,616	2,909	647
Italy	59,504	-	-	-	59	147	265	59
Japan	127,975	-	-	-	127	317	570	127
Mexico	125,891	-	-	-	184	460	828	184
Republic of Korea	50,594	-	-	-	61	151	272	61
Russia	143,888	-	-	-	186	465	837	186
Saudi Arabia	31,557	-	-	-	29	71	128	29
South Africa	55,291	-	-	-	75	187	337	75
Turkey	78,271	-	-	-	116	290	522	116
United Kingdom	65,397	-	-	-	64	161	290	64
United States	319,929	-	-	-	236	589	1,060	236
Other Asia	330,935	-	-	-	530	1,324	2,384	530
Other oil-producing countries	517,452	-	-	-	774	1,936	3,485	774
Rest of euro area	117,427	-	-	-	106	265	478	106
Rest of OECD	33,954	-	-	-	27	67	121	27
Rest of world	2,505,604	-	-	-	4,986	12,464	22,435	4,986
Total	7,983,209	279	3,493	12,573	15,188	37,971	68,347	15,188

Source: Table 2 in McKibbin and Fernando (2020).

Table 3 GDP loss in 2020 (percentage deviation from baseline)

Country/Region	S01	S02	S03	S04	S05	S06	S07
Australia	-0.3	-0.4	-0.7	-2.1	-4.6	-7.9	-2.0
Brazil	-0.3	-0.3	-0.5	-2.1	-4.7	-8.0	-1.9
China	-0.4	-1.9	-6.0	-1.6	-3.6	-6.2	-2.2
India	-0.2	-0.2	-0.4	-1.4	-3.1	-5.3	-1.3
Rest of euro area	-0.2	-0.2	-0.4	-2.1	-4.8	-8.4	-1.9
France	-0.2	-0.3	-0.3	-2.0	-4.6	-8.0	-1.5
Germany	-0.2	-0.3	-0.5	-2.2	-5.0	-8.7	-1.7
South Africa	-0.2	-0.2	-0.4	-1.8	-4.0	-7.0	-1.5
Italy	-0.2	-0.3	-0.4	-2.1	-4.8	-8.3	-2.2
Japan	-0.3	-0.4	-0.5	-2.5	-5.7	-9.9	-2.0
United Kingdom	-0.2	-0.2	-0.3	-1.5	-3.5	-6.0	-1.2
Rest of World	-0.2	-0.2	-0.3	-1.5	-3.5	-5.9	-1.5
Mexico	-0.1	-0.1	-0.1	-0.9	-2.2	-3.8	-0.9
Canada	-0.2	-0.2	-0.4	-1.8	-4.1	-7.1	-1.6
Rest of OECD	-0.3	-0.3	-0.5	-2.0	-4.4	-7.7	-1.8
Rest of oil-producing countries	-0.2	-0.2	-0.4	-1.4	-3.2	-5.5	-1.3
Argentina	-0.2	-0.3	-0.5	-1.6	-3.5	-6.0	-1.2
Russia	-0.2	-0.3	-0.5	-2.0	-4.6	-8.0	-1.9
Saudi Arabia	-0.2	-0.2	-0.3	-0.7	-1.4	-2.4	-1.3
Turkey	-0.1	-0.2	-0.2	-1.4	-3.2	-5.5	-1.2
United States	-0.1	-0.1	-0.2	-2.0	-4.8	-8.4	-1.5
Other Asia	-0.1	-0.2	-0.4	-1.6	-3.6	-6.3	-1.5
Indonesia	-0.2	-0.2	-0.3	-1.3	-2.8	-4.7	-1.3
Republic of Korea	-0.1	-0.2	-0.3	-1.4	-3.3	-5.8	-1.3

Source: Table 10 in McKibbin and Fernando (2020).

A range of policy responses is important both in the short term as well as in the coming years. In the short term, central banks and treasuries need to make sure that disrupted economies continue to function while the virus outbreak continues. In the face of real and financial stress, there is a critical role for governments. While cutting interest rates is a possible response for central banks, the shock is not simply a demand management problem but a multi-faceted crisis that will require monetary, fiscal and health policy responses. Quarantining affected people and reducing large-scale social interaction is an effective response. Wide dissemination of good hygiene practices, as outlined in Levine and McKibbin (2020), can be a low-cost and highly effective response that can reduce the extent of contagion and therefore reduce the social and economic cost.

The longer-term responses are even more important. Despite the potential loss of life and the large-scale disruption to a large number of people, many governments have been reluctant to invest sufficiently in their health care systems, let alone public health systems in less-developed countries where many infectious diseases are likely to originate. Experts have warned, and continue to warn, that zoonotic diseases will continue to pose a threat to the lives of millions of people, with potentially major disruption to an integrated world economy. The idea that any country can be an island in an integrated global economy has been proven wrong by the latest outbreak of COVID-19. Global cooperation, especially in the sphere of public health and economic development, is essential. All major countries need to participate actively. It is too late to act once the disease has taken hold in many other countries and to attempt to close borders once a pandemic has started.

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