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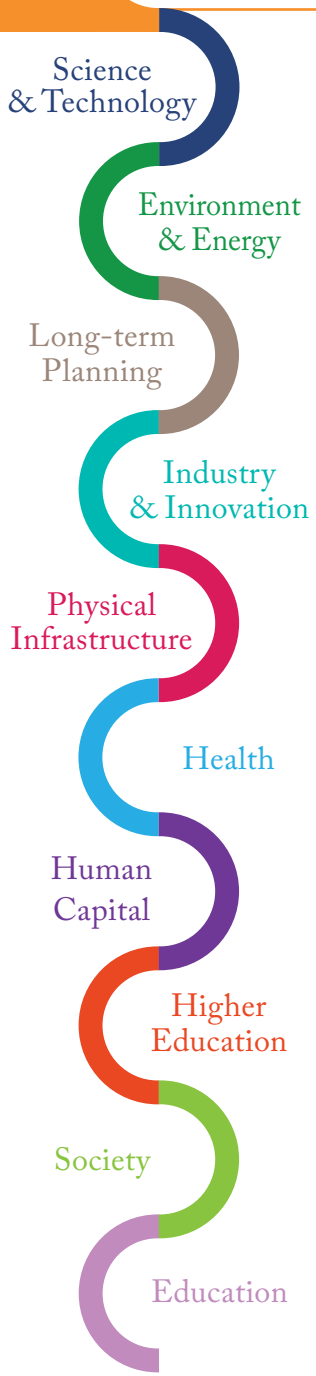

The Global Economic Impact of COVID-19: A Summary of Research

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Abstract

This essay surveys and summarizes recent research and reports on the global economic impact of the COVID-19'new coronavirus'. It argues that the major impact of the epidemic, or alleged pandemic, is on the supply side of the global economy – while remedies now considered and applied are largely on the demand side. The global armory of tools against supply side disruptions and shocks is very very limited. Under reasonable scenarios, a global recession is likely.

"We do recognise that an [interest] rate cut won't reduce the rate of infection ….It won't fix a broken supply chain. We get that. We don't think we have all the answers. But we do believe our action will provide a meaningful boost [for] the economy."

- Jerome Powell, Chairman, US Federal Reserve, at a press conference.

"….an enormous and extremely fragile network….that has been building for centuries but that in the past two decades has grown through seamless connection to modern technology. Our way of life has shifted – from individuals to markets, from localized to globalized. So far, this interconnectivity has largely been a strength, creating a network so big that each of its smaller nodes can be imperfect or fail while the others persist. But much like a virus exploits a small vulnerability, creating a chain of reactions that allow it to weaken its host, a true global pandemic could work its way through the interconnected ecosystems that support our present way of life."

Charlie Warzel, "The coronavirus will test our new way of life", New York Times, Global Edition, March 5, 2020, p. 12.

Definition: Pandemic isa word from the Greek: pan, meaning "all" and demos meaning "people". It is the term used by disease experts when epidemics are growing in multiple countries and continents at the same time.

The World Health Organisation defines pandemic as "an outbreak of a new pathogen that spreads easily from person to person across the globe".

So, a disease outbreak is a pandemic when it is a) widespread, b) over several countries or continents, and c) usually affecting a large number of people. The disease must also be infectious, spreading from one person to another.

An epidemic is an event in which a disease is actively spreading. Usually, this is an outbreak that has grown out of control but is often within one country or location.

A pandemic, in contrast, is an epidemic on a far greater geographic scale that affects a much large number of people.

COVID-19 is a coronavirus, a family of viruses (not flu or influenza), that normally reside in animals, but can ‘jump’ from animals to humans. COVID-19 is not flu, but it is somewhat similar, in that it causes respiratory problems – in severe cases, damaging the lungs and keeping oxygen from essential body organs.

COVID-19, we believe, originated in pangolins (an animal similar to an armadillo, which was sold in markets as food). They in turn may have contracted it from bats. Bats are mammals that harbor many kinds of viruses, because they are apparently somewhat immune and are not killed by them, so they provide convenient breeding grounds.

Is the coronavirus a pandemic? Yes, since the virus has spread to over 50 countries and across multiple continents, But the World Health Organization (WHO) has insisted that we are "not there yet", suggesting we are instead fighting a series of epidemics.

"For the moment, we are not witnessing the uncontained global spread of this virus and we are not witnessing large-scale severe disease or deaths," Dr Tedros Adhanom Ghebreyesus, the WHO director general, said.

Background

There is a great deal of confusion and misunderstanding regarding flu viruses. Barry[1] provides important basic knowledge.

Flu viruses are composed of RNA (ribonucleic acid), with eight genes. Of three types of flu virus, A B and C, only type A threaten pandemics. Viruses have antigens that allow them to bind to a cell, reproduce and replicate, and then escape the cell, to invade others.

This process is very rapid. Some eight hours after a single flu virus infects a single cell, that cell can produce between 100,000 and 1 million new virus particles. The good news: Only 1 percent of these new virus particles can infect other cells. The bad news: that still translates to between 1,000 and 10,000 functioning viruses, each of which is different.

Flu spreads by large droplets and can survive on hard surfaces (like doorknobs), for a day or longer. It survives best in low temperatures and low humidity. Seasonal flu tends to last in a community for 6-8 weeks and infects about 10 per cent of the population. Pandemic flu infects 15 to 40 per cent – because this variety of flu presents “the human population with new antigens that the human immune system does not recognize”.

There have been “at least 10 pandemics in the last 300 years and probably many more going farther back in history – most recently, 1889, 1918, 1957 and 1968”,caused by H1, H2 and H3 viruses, where the numbers indicate the three types of antigens. [Viruses are labelled with “H” and “N” numbers; the “H” indicates hemagglutinin, and the “N” neuraminidases, the antigens the virus uses to invade cells. The numbers indicate different types of antigens.]

In humans, the flu virus “generally binds to cells in the upper respiratory tract (lungs)”.

A key statistic for flu is R0 (the number of additional cases, caused by one case of flu). R0 for seasonal flu varies, with a mean of 1.3, though in 1951 it approached 2.0. In the

1918 pandemic R0 may have approached 4.0. The R0 value for COVID-19 has been estimated at 2.5.

For most diseases vaccines are 100% effective. Not, however, for flu. A good flu vaccine is 70% effective. For 2007-8 flu season, the vaccine was only 44 percent effective. Making a vaccine for a new virus [e.g. COVID-19] is more difficult than for ordinary flu. As Dorratoltaj, N., et al.[2] [14] note, “Scenarios of delay in vaccine introduction with limited vaccine efficacy and limited supplies are not unlikely in future influenza pandemics, as in the 2009 H1N1 influenza pandemic.”

Learning from History

There have been four pandemics in the past 130 years: in 1889, 1918, 1957 and 1968.

In 1889-1892, an H2N2 virus came in three extended waves (Barry[1]). It began in Turkestan, in May 1889, reached Berlin and Paris after several months, then in a few weeks crossed the ocean to the US, then to Hong Kong and Japan. There was a second wave, mainly transferred by ships. The third wave began in October 1891, making it a true pandemic, and it lasted until the spring of 1892, and it was the most lethal. No reliable statistics, though, are available.

In 1918, the first cases emerged in the US in January, in Kansas, spread rapidly in US Army camps, and by April was spreading through Europe. The first wave disappeared in the US but had spread to Asia and Europe. The second wave occurred in late July in Switzerland and “by mid-October most of the world’s cities had experienced this deadly wave, and it did not die out. R0 (see below) (the number infected from one case) “may have approached 4.0” (Barry[1]). The third wave spread from Jan-April 1919 and caused a third of the total deaths. Mortality was estimated in the order of 10 per cent of those who contracted the flu.

“In total the 1918 virus killed between 1.9 and 5.5 per cent of the total world population”; more than half the dead were young adults. The estimate total number of deaths totaled between 34.4 million and 100 million. The influenza returned in 1920, but was not as severe as in 1918 and 1919.

In 1957 “Asian flu”, H2N2, began in late February in China, became epidemic in Hong Kong in April, and then reached Japan. It spread worldwide. Outbreaks occurred in the US from June through October; the “influenza-related mortality rate was extremely low”. There was a second wave in January to March 1958, with deaths totaling 20,000. A third wave, January to March 1960, had a sharp peak, quick falloff, and 26,000 deaths. Some 20-25% of the deaths were caused by viral pneumonia.

In 1968, the H3N2 virus began in Hong Kong, in July, and reached the US, and Japan, in August, and Britain, in September. The first wave peaked in Jan. 1969; the second wave, a year later. Morbidity was around 20%. Mortality in the US was estimated at 34,000 people, compared with a baseline mortality from seasonal influenza of some 20,000 – but there were few cases of viral pneumonia. This was “the mildest of the four pandemics”.

Barry notes that the “H” and “N” numbers matter. “Novel H1N1 seems to have the ability to bind to cells deep in the lung, which H5N1 does not and which the 1918 virus could do”. Also, “this virus may have other things to teach us… we do not know the whole story of how influenza becomes transmissible from human to human….”He asks, a decade ago, “a key question….how long will it take to produce and distribute a vaccine”.

The SARS (Severe Acute Respiratory Syndrome) outbreak in 2003 was defined as an epidemic, but not a pandemic. In 2009 swine flu (H1N1) was defined a pandemic but it was considered a relatively mild version. Keogh-Brown et al.[3] noted, in 2009, that “the current pandemic has not removed the threat of a more virulent avian flu pandemic in the near future. From this infectious disease precipice the importance of pandemic planning is plain”. (p. 543).

The Macroeconomic Impact of Pandemics

Some basic Economics 101 supply-and-demand analysis can be helpful, in assessing the macroeconomic impact of COVID-19 (See Figure 1). A good starting point is the observation by Deloitte[4] that “COVID-19 could affect the global economy in three main ways: by directly affecting production (supply), by creating supply chain and market disruption (supply) and by its financial impact on firms and markets (principally, demand).

The initial primary impact of COVID-19 is on the supply side. Factory closures in China and elsewhere lead to a contraction in macroeconomic supply of goods and services, moving the global economy from point ‘a’ to point ‘b’ – lower output, higher prices, or what is known as ‘stagflation’.

A demand-side response to the contraction (e.g. Central Banks lower interest rates) to increase demand will aggravate the inflation, with only a small impact on output and employment, especially if in the short term the supply curve (which is also a cost curve) is price-insensitive, owing to the inability to find alternate sources of parts and materials.

Note that the second-round impact of a global epidemic will result in moderate to major contractions in demand. As supply-side disruptions close factories and places of work, consumers will cut back on their spending, shifting demand curves inward, reducing GDP, boosting unemployment and moderating price rises. Some of this lost demand will be temporary, and when the epidemic recedes, consumers will ‘catch up’ on their spending, such as on vacations. But some of the demand will be lost permanently, thus reducing long-run global economic growth.

Maital[5] has argued that the massive expansion in credit and money in the decade since 2009 has created a mystery – why has not this mountain of money generated inflation? The answer is, China’s almost infinitely-elastic supply curve, and massive production capacity, together with Internet-driven global supply of goods and services, able to supply world demand without higher prices. The inflation, it is noted, occurred in equity prices, with stock markets soaring as investors borrow money at near-zero interest rates and find few attractive investment opportunities other than equities.

The COVID-19 epidemic/pandemic will thrust a spoke in the wheel of this global infinitely-elastic supply curve. The question is, will the decline in demand offset the shrinkage of supply? If not, at last, after stable prices since 2008/9, we may see the initial signs of inflation, as a result of COVID-19, as supply chains are disrupted and the supply of goods and services from China and to some extent India is disrupted.(See Box: Case Study -Supply Side Disruption of Pharmaceuticals).

Box

Case Study: Supply Side Disruption of Pharmaceuticals:

A strong example of supply side disruption is that of pharmaceuticals and API's – advanced pharmaceutical ingredients, as reported in the New York Times

"Mumbai, India: The spreading coronavirus may soon affect people's health in a different way: The outbreak is now starting to hurt the supply of essential drugs. Drug makers are struggling to get vital raw ingredients for common antibiotics and vitamins from Chinese factories, which were closed for weeks as China battled to contain the coronavirus. Now, even as some of the country's factories have restarted, shortages of some drugs may develop. The disruption is being felt most acutely in India, where the authorities on Tuesday ordered the country's vast pharmaceutical industry to stop exporting 26 drugs and drug ingredients, most of them antibiotics, without explicit government permission. That's a problem for the rest of the world, which relies on India's drug makers for much of its supply of generic drugs. India exported about $19 billion of drugs last year and accounted for about one-fifth of the world's exports of generics by volume, according to the India Brand Equity Foundation."[6]

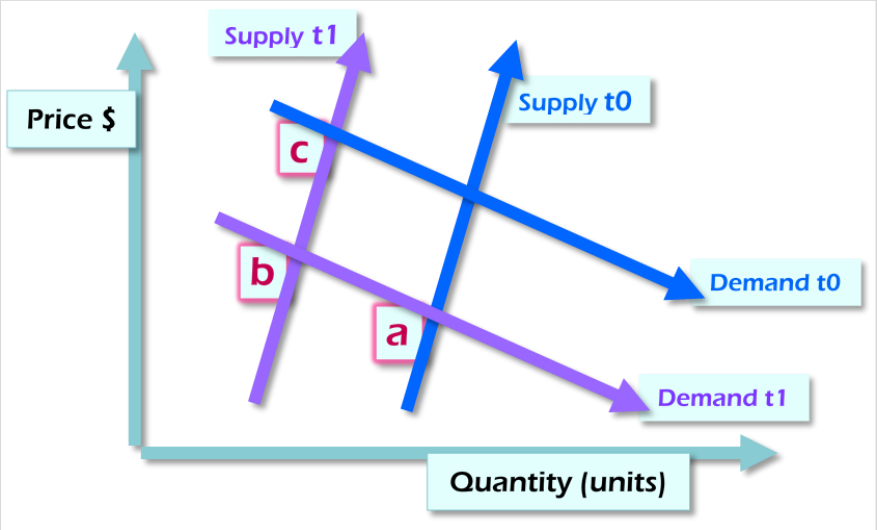

Figure 1: Demand & Supply Analysis of the COVID-19 Impact

Smith et al.[7] construct a systems model of an influenza pandemic's impact on the UK, published in 2009. The "costs related to illness alone ranged between 0.5% and 1.0% of gross domestic product for high fatality scenarios, and larger still for an extreme pandemic. In the face of widespread school closures in China, Japan, Italy and elsewhere, their conclusion is striking: "Balancing school closure against 'business as usual' and obtaining sufficient stocks of effective vaccine are more important factors…than is the disease itself. Prophylactic absence from work in response to fear of infection can add considerably to the economic impact."

Two decades ago, Meltzer et al.[8] studied the economic impact of a pandemic influenza in the US. Their conclusions are sobering: "We estimated 89,000 to 207,000 deaths, 314,000 to 734,000 hospitalizations, 18 to 42 million outpatient visits, and 20-47 million additional illnesses. Patients at high risk (15% of the population) would account for approximately 84% of all deaths. The estimated economic impact would be US$71.3 to $168.5 billion, excluding disruptions to commerce and society."

A study by McKinsey, global consulting company, done recently, released on February 28[9] suggests that "the impact on demand slows down growth of the global economy – between 1.8-2.2% instead of the 2.5% growth envisioned at the start of the year". As this essay is written in early March, McKinsey estimates already seem far too optimistic.

Scenario Planning

Faced with extreme uncertainty, like the kind now facing the world regarding COVID-19, scenario planning is a common response – defined as identifying a specific set of uncertainties, and for each specifying different "realities" of what might happen in the future.

McKinsey[9] proposes three scenarios:

- **Quick recovery** – cases peak in multiple regions, the virus proves not resilient to seasonality (Spring), aviation, tourism, hospitality bounce back to normal as countries lift travel bans. The likelihood of this now appears slim.
- **Global slowdown** (base case): China recovers, with large industrials leading, small-medium enterprises follow, near-complete China restart by Q2, consumer confidence dampened through Q2 and Q3,different recoveries by sector.
- **Global pandemic and recession**: Generalized global spread, continued flu case growth until mid-Q2, COVID-19 resistant to seasonal effects, substantial demand shock that lasts through the bulk of the year, consumer confidence remains anemic. This scenario now appears most likely.

Similarly, Goldman Sachs[10] describes a "downside scenario" in which widespread supply chain disruptions as well as domestic demand weakness [spreads] across the global economy, with a "sharp sequential contraction in global GDP in Q1 and Q2, i.e. a global recession".

Deloitte[4] describes a scenario of a COVID-19 induced recession that pushes the real economy into a contraction. As the COVID-19 epidemic spreads, "the vulnerability of major economies, including the US economy, has risen as growth has slowed and the expansions of various countries are now less able to absorb shocks." Deloitte optimistically suggests that recovery from this COVID-19 induced recession will be V-shaped (sharp downturn, sharp recovery), based on previous epidemics such as SARS, 1968 Asian flu, 1958 Hong Kong flu and 1918 Spanish flu.

McKibbin et al.[11], published March 2, 2020, estimate total GDP loss ($ billion) for 24 industrial nations under seven different scenarios, that differ in severity. The range of the total cost of COVID-19 ranges from minimal, $283 billion total, to large ($9.2 trillion). In the worst of the seven scenarios, there is a sharp drop in consumption and investment, causing a sharp drop in equity markets, a major shift into bonds and decline in profits. The worst-case scenario includes an assumption that "the pandemic will recur each year into the future". They warn that "…zoonotic disease [an infectious disease caused by bacteria, viruses, or parasites that spread from non-human animals (usually vertebrates) to humans] will continue to pose a threat to the lives of millions of people with potentially major disruption to an integrated global economy…. Global cooperation is essential.". (p. 25).

The International Monetary Fund[12] [13] describes the 'current baseline scenario' in which "China's economy returns to normal in the second quarter, and as a result the impact on the world economy would be relatively minor and short-lived….in this scenario 2020 GDP growth for China would be 5.6 per cent, or 0.4 percentage points lower than the January World Economic Organization update."

The Crucial Role of the Chinese Economy

Bain & Co.[13] adopts a more pessimistic outlook, noting that "the recent outbreak [of COVID-19] is expected to cost more than any previous epidemic. "The reason is the changing role of China. "SARS reduced China's GDP by 1%, in 2003….but at the time China represented just 4% of global GDP. Today China makes up more than 16% of global GDP [the world's second largest economy].…SARS and epidemics like it also disproportionately affect secondary and tertiary industries. Manufacturing and services now represent a higher proportion of China's GDP (93%) than their proportion of GDP (85%) during the SARS outbreak 20 years ago".

Smith[14] argues: "the economic hit from COVID-19 will be harder than you think". He notes that "private companies which account for 60% of China's GDP have been hit the hardest". They lack government subsidies and do not have the resources to ride out months with no cashflow while paying rents and wages. And even after recovery from COVID-19, Smith cites a study arguing that "most [Chinese] factories have a severe shortage of workers, even after they are allowed to open. This is going to have a severe impact on global supply chains…"

How Businesses Should Respond

Reeves et al.[15] provide a checklist of steps that businesses can take, to respond to the COVID-19 crisis: 1. Update intelligence. That is track the latest information. This is harder than it seems, because there is an enormous amount of hysteria, panic and false data. 2. Beware of hype. See #1 – "as you absorb the latest news, think critically about the source of the information before acting on it." 3. Share information. "We have found that creating and widely sharing a regularly updated summary of facts and implications is invaluable". 4. Use experts and forecasts carefully. "Each epidemic is unpredictable and unique, and we are still learning about the critical features of the current one." 5. Reframe your understanding of what's happening constantly. "A Chinese general once said: Issue orders in the morning, change them in the evening". 6. Beware of bureaucracy. Everybody will weigh in, about what to do --avoid the inertia and delay that may result. 7. Make sure your planned response is balanced, across: Communications, employee needs, travel, remote work, supply-chain, business tracking, and corporate responsibility. 8. Use resilience principles. Resilience requires 'redundancy' (2nd, 3rd sourcing of supplies), diversity (multiple approaches), modularity (assemble your business system in different ways), Evolvability (adapt and change, fast!), prudence (avoid hysteria), and embeddedness (live your values, don't survive at others' expense). 9. Prepare now for the next crisis (expect more troubles after COVID-19). 10. Intellectual preparation is not enough. (Set up a small war room, practice various scenarios). 11. Reflect on what you've learned. 12. Prepare for a changed world. We won't be the same world after all this blows over.

Crisis as Opportunity

It may sound trite, but – crises are (for the bold and the brave) opportunities. At the end of February 2003, when the SARS crisis broke out and Chinese businesses went into lockdown, Alibaba, under Jack Ma, organized the construction of its new on-line platform, with people working from home and communicating by phone and modem. Alibaba's market capitalization today is $547 billion.

Conclusion

Expert epidemiologists assert that COVID-19 will not disappear – it is with us to stay. While the initial vaccines may go into clinical trials within 6 weeks, it will still take up to a year before they are commercially available. Until then, conventional measures will be needed that date back to the middle ages – quarantine, limited social contact, school closings, etc. At all levels – individual, family, neighborhood, community, region, nation – the resilience of our economic, social and medical systems will be tested severely in the coming year[16].

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