The COVID-19 Economy:
Building a Sustainable Future in the Shadow of a Crisis

ICT India Working Paper #33

Nirupam Bajpai and John Biberman

July 2020

Center for Sustainable Development
EARTH INSTITUTE | COLUMBIA UNIVERSITY

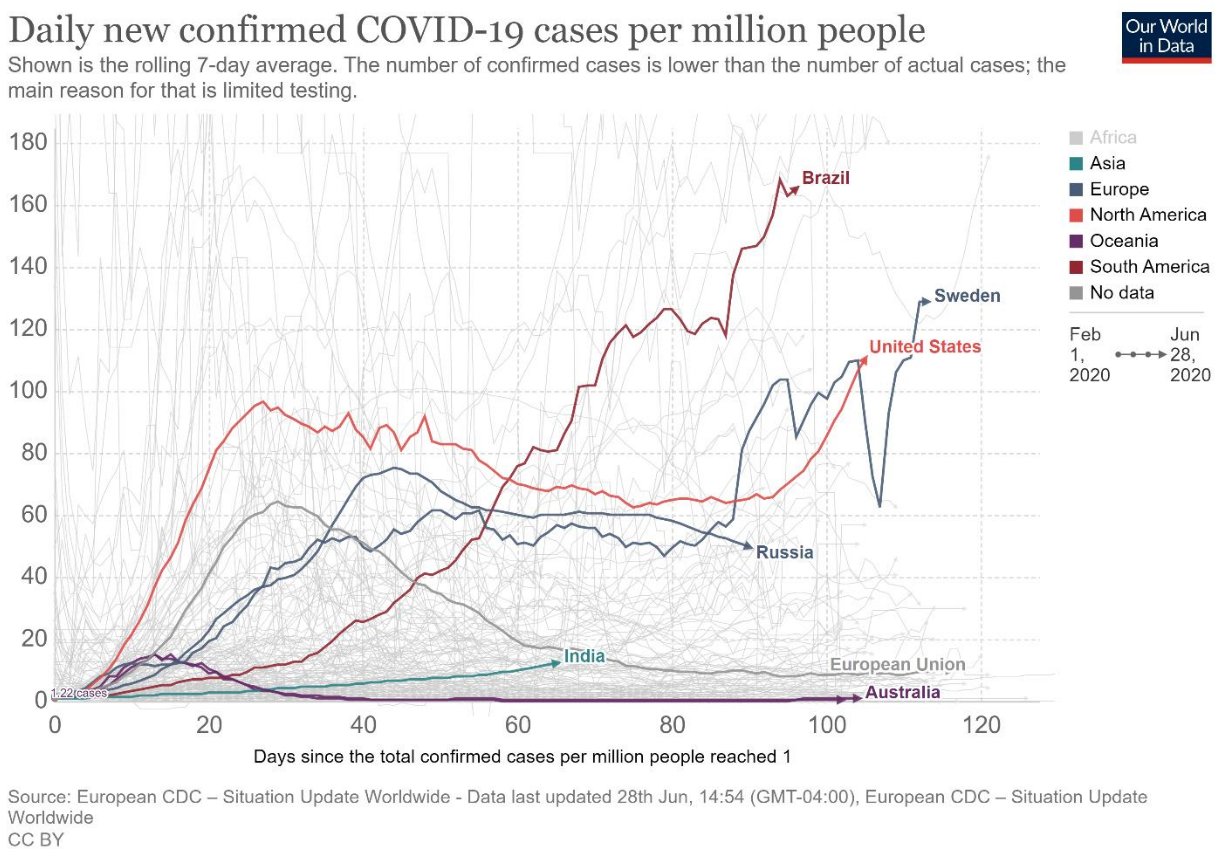
Abstract

As the global economy has continued to suffer from the ongoing COVID-19 pandemic, pressure has mounted for local and national economies to reopen despite the danger of disease. Unfortunately, before robust medical precautions are implemented, any such reopening will eventually prove futile, doing more harm than good. Areas which reopen must at the minimum have universal testing schemes and the capacity to identify and quarantine all arrivals from outside. Without this, new outbreaks will spring up without advance warning, forcing economies to close down again. Even if such mitigation measures are successfully adopted, latent fear will prevent many from returning to the patterns of everyday life until a vaccine is successfully developed and adopted. Until such a vaccine is produced, countries will have to introduce policies to shelter both people and businesses from the potential permanent impacts of a lengthy period of shutdown.

The policies needed to respond effectively to the coronavirus, if successfully implemented and maintained, would yield the kinds of substantial advances in governance, social welfare, business development, and workforce adaptation that would move adopters well along the path of sustainable development and an inclusive embrace of the Fourth Industrial Revolution (4IR). For instance, governments would have the means to provide rapid economic support to their most vulnerable groups, while ensuring that key social services such as health and education were provided at a high and equitable standard. Groups once excluded from the halls of power could make their voices heard through advances in e-governance which include them in policy and decision-making processes. Advances in remote work and the sustainable design of cities could reduce inequalities and promote decent standards for employment while dramatically slashing pollution in urban spaces. Finally, the partnerships which have emerged between the public, private, and nonprofit sectors, if maintained, could develop into sources of strong, practical solutions to the full spectrum of challenges which will face society in the 21st century. Countries, in effect, have a binary choice between shielding their populations and preparing for their economic futures or maintaining status quo arrangements which will result in depression, unnecessary death, and lost competitiveness.

Introduction

As of the publication of this paper, the COVID-19 pandemic continues to rage across the globe. Global confirmed cases have reached ten million, with nearly half a million dead, as the brunt of the disease has started hitting not just the wealthy, globally interlinked countries of Western Europe and North America, but also less resourced countries in South America, Eastern Europe, and South Asia. Some countries, such as Australia and New Zealand, have almost wholly contained incipient outbreaks through model applications of the best practices demonstrated by the East Asian countries first hit by the virus. As a result, their domestic societies have had the luxury to return to a sense of normalcy to a large degree, although their connections to the global economy remain hampered both by ongoing mitigation policies and outbreaks abroad. Few other countries have demonstrated either the institutional memory from other outbreaks or the combination of resource availability, urgency and coordinated policy and societal action required for the containment of the disease.



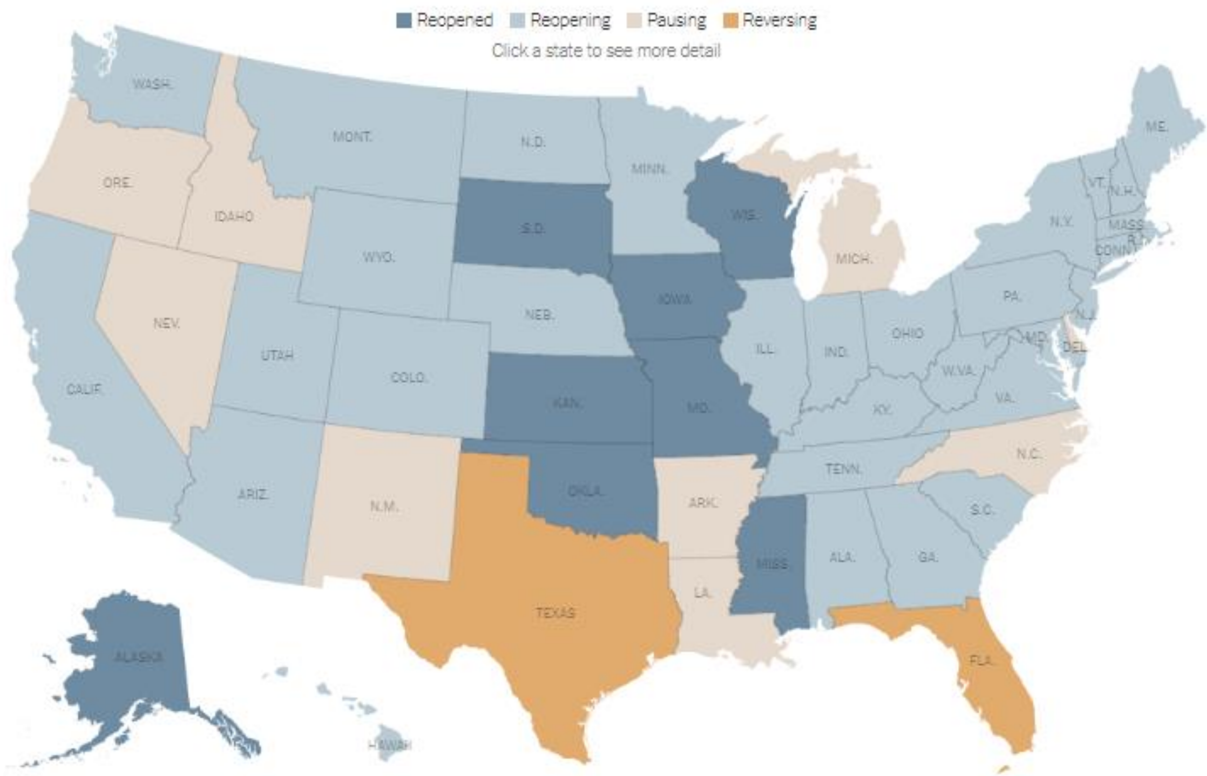
Wealthy countries which have experienced significant outbreaks, at this point, can be sorted into two camps. The first group includes countries such as France, Italy, and Spain, which were hit by widespread infections at the onset of the pandemic when knowledge about the disease was at its most limited and public responses were at their most chaotic. The national governments of these countries undertook swift, decisive actions, namely lengthy national lockdowns, to halt the disease in its tracks. While these measures seemed draconian at the outset, they allowed these countries to get ahead of the virus by preparing the infrastructure necessary for identifying and containing future COVID-19 clusters before they spread out of control. Economic rescue packages have allowed businesses and individuals to weather this period of economic lockdown, and cases in these countries have grown at a slow, yet manageable rate since lockdowns began to be lifted, allowing their medical systems to cope with the influx of new patients.

A maxim of public health is that any successful preventative intervention will appear too severe without the benefit of hindsight, and the second category of developed countries includes those which have either failed to anticipate the demands COVID-19 would place on their economy or attempted to maintain a set of status quo arrangements despite the clear and lasting damages to economic and public health resulting from them. These countries, for the most part, initially framed their approach to the pandemic as a “herd immunity” strategy in which vulnerable populations would be protected by deliberately exposing enough healthy people to the virus that the outbreak would die out in the absence of new potential carriers. Such a strategy, tantamount to doing nothing to combat the virus, has proved itself untenable as medical systems have proved unable to cope with the resulting wave of disease, even in countries with well-respected universal health care systems such as Sweden and the United Kingdom. The United Kingdom, to its credit, abandoned its herd immunity strategy in mid-March once it became clear that shielding the vulnerable from infection was far more difficult in reality than in theory. Sweden, however, has persisted with this approach despite mounting criticism. The result has been a caseload and mortality rate far exceeding that of comparable neighbors such as Norway, Denmark and Finland. Nor do the economic benefits from such an approach seem to balance out this inevitable and unnecessary destruction; while the Swedish government has cited avoidance of economic pain as justification for its herd immunity strategy, the Swedish economy still remains on pace to contract by 7% this year, which would amount to its worst recession since World War II.[1]

The United States, by the sheer incompetence of its public health response, has placed itself in a category almost entirely of its own. After a period of federal institutional denial regarding the severity of the virus, during which precious time for ramping up PPE production and testing systems was squandered, the country underwent a haphazard, state by state response during which basic safeguards of public health and preventative measures were politicized as a means of partisan attack. States such as New York, which adopted strict and widespread lockdowns with a high volume of easily accessible testing, have contained their outbreaks to the point where state officials have begun proceeding with staged, closely monitored economic reopening similar to the European model. But states in the Sun Belt, especially those under Republican administrations such as Arizona, Texas, and Florida, have advanced a false choice between public health and economic health which has endangered the lives of their residents. Coming down on the alleged side of economic health, these state governments have watched complacently as cases and death tolls mounted until public pressure and reality have started forcing them to belatedly take preventative measures. Florida only halted its reopening plans once it recorded 9000 new daily cases on June 26, shattering not only its own record, but the

[1] Rolander, Niclas et al. “Sweden in ‘Very Deep Economic Crisis’ Despite Soft Lockdown.” *Bloomberg News*, May 19, 2020. https://www.bloomberg.com/news/articles/2020-05-19/sweden-in-very-deep-economic-crisis-despite-soft-lockdown

record set by Italy at the beginning of its own severe lockdown.[2] Arizona has taken this to an entirely new level, proceeding with its reopening plans even after recording its highest ever daily caseload. Taking key preventative measures has only been complicated by a President who, believing that higher reported caseloads hurt his reelection prospects, has falsely claimed that more testing creates more cases and has publicly admitted to slowing down the rate of national testing.



Progress of State Reopening Plans in the United States as of June 26. Source: New York Times.

As a result, the United States stands once again at the precipice of an out-of-control epidemic, standing to lose all the gains from an extremely difficult period of economic shutdown and social distancing. The national economy appears set to suffer further harm not just from falling domestic demand, but from falling international demand as well. The European Union announced on June 26 that American travelers would be barred from travel once the bloc reopened on July 1, a development sure to be followed by travel bans from other regions. The national economy is set to suffer even further as the outbreak fails to be contained domestically. Absent interstate quarantine measures, which can only legally be implemented by an apathetic federal government, states which took the initial outbreak seriously stand to experience both harsh economic pain and a high toll on public health – the worst of both worlds.

[2] Duda, Jeremy et al. "How Arizona 'lost control of the epidemic.'" *Washington Post*, June 25, 2020. https://www.washingtonpost.com/health/how-arizona-lost-control-of-the-epidemic/2020/06/25/f692a5a8-b658-11ea-aca5-ebb63d27e1ff_story.html

The sum of global experience so far has demonstrated that any attempt at a premature economic reopening is doomed to fail in the absence of measures to contain the emergence of a second wave, let alone before the first wave has been fully contained. Even if policymakers are concerned solely about the health of the economy, fear of contracting the disease among the general population will stop economic reopening plans from achieving their goals before these basic prerequisites are met. First and foremost, direct medical needs must be met, including making sure that PPE production is adequate and usage is widespread, universal testing is performed on a regular basis, and an arrangement for quarantining travelers from areas which have not controlled the virus is put into place. Second, governments must step in and provide support to individuals and businesses to prevent anyone from having to risk their health to preserve their well-being. These include wage guarantees and direct payments for workers in industries unable to reopen, loan guarantees and forgiveness for businesses which have lost revenue and are threatened by outstanding obligations, and meaningful oversight to prevent the abuse of such programs by the influential and well-connected. Finally, systems allowing workers to continue their employment remotely where possible and to both prevent the erosion of marketable skills and develop new skills relevant for the economies they will emerge into once the pandemic has reached its end should be put into place.

Economic reopening should be seen not as a continuation, but as a refutation of the status quo. No true return to normal will be possible until a vaccine for COVID-19 has been developed and widely distributed, and even these sweeping measures will only serve as economic stopgaps until such a point is reached. But in the world that will be born in the wake of the pandemic, the very measures that will allow the most successful countries to cope will also prove their worth as building blocks for a more sustainable, inclusive future. A post-pandemic future, should we choose it, can be one in which air quality is improved by reducing unnecessary transportation, preventative care is affordable and universally accessible, the needs of the poorest and most disadvantaged are provided for, governance is proactive and transparent, and institutions are capable of rapid coordination in order to solve collective problems. Just as we need to practice sustainable development to survive this pandemic, we will need to continue practicing it in the years ahead before we are swamped with the many looming crises the 21st century will present. ICT lies at the heart of facing all of these challenges, from providing the foundation for flexible and responsive healthcare systems to building the capacity of the workforce of the future to find productive and dignified employment. COVID-19 seemingly poses an overwhelming challenge, but it will only be the first of many unless it is taken as an opportunity to adapt to the new world we are about to enter.

The Futility of Premature Reopening

Many policymakers have advocated for a return to normal for society and a reopening of the economy as quickly as possible, despite the ongoing pandemic. Some have called for this only after doing the hard work of identifying known cases of the virus, quarantining the sick, and taking every necessary step to ensure that the disease has been eliminated from their jurisdiction. This does not mean an immediate return to normal, as latent fear and suspicion will persist and hamper any full economic recovery until a vaccine is finally developed and distributed, doing away with the virus once and for all. It is, however, the most positive outcome any leader can hope for which remains entirely within the bounds of their control, and it is one that should be encouraged.

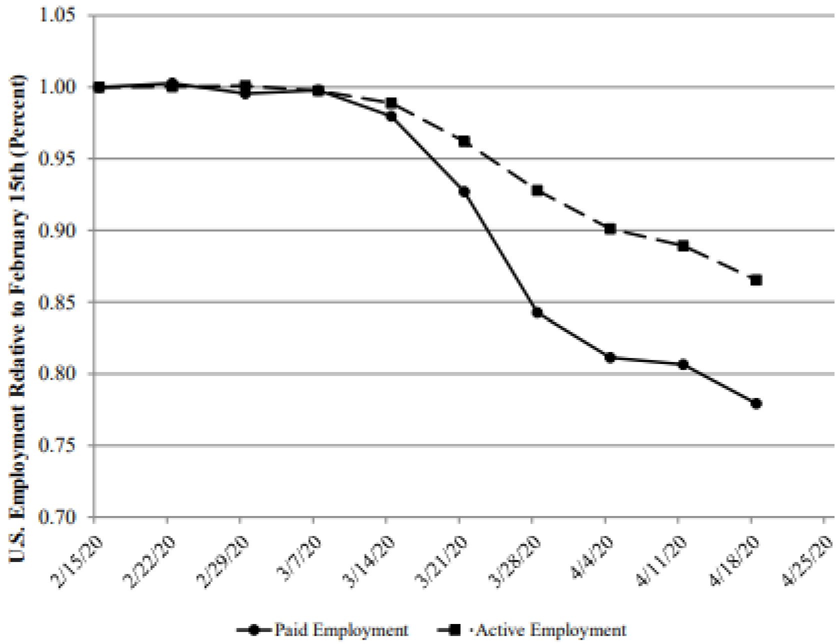
Other leaders, on the other hand, have pushed for economies to return to normal before the virus has been entirely controlled. At the beginning of the pandemic, this could have been attributed to simple ignorance of the contagious, pernicious and deadly nature of this disease. Over time, however, this group of leaders has begun pushing an ugly and false choice between the health of the economy and the health of the country. US President Donald Trump, one of the first prominent figures to push this argument, declared in the midst of a stock market nosedive on March 23 that the United States could not “let the cure be worse than the problem itself,” before announcing a wildly ambitious and unrealistic plan to entirely reopen the country by Easter. Other figures in the United States later made the case in much starker terms; Texas Lieutenant Governor Dan Patrick would gain great notoriety for claiming that senior citizens should be “willing to take a chance on their survival, in exchange for keeping the America that all America loves for their children and grandchildren.” Indeed, as the disproportionate burden of the disease on the old and infirm came into focus, partisans began pushing for the abandonment of social distancing measures, with some even claiming that because the elderly had fewer years to live, the value of their lives should weigh less in the supposed calculation between economic health and public health. Other world leaders, such as Brazil’s Jair Bolsonaro, apparently never even struggled with the idea. Clearly motivated by the desire to preserve the economy, Bolsonaro has downplayed and dismissed the severity of the disease from the outset, calling it nothing more than a “little flu” and taking virtually no measures to stop the spread of the virus even after his own spokesman tested positive and Brazil developed into one of the worst global hotspots.

Even ignoring the fact that an economy exists for the well-being of the people who comprise it, is there any virtue to this assumption that policymakers must make a tradeoff between the economy and public health? After all, national lockdowns have coincided with unprecedentedly rapid and widespread economic destruction. In the United States, private sector employment contracted 22% between mid-February and mid-April, three times the change in employment during the Great Recession. This economic contraction hit the poorest segments of society especially hard, not coincidentally the demographic most impacted by the virus. The bottom income quintile experienced a contraction of 35% in private sector employment during this period, compared to only a 9% contraction for the top quintile, a disproportionate impact on lower-wage workers which persists even after accounting for confounding factors such as industry, business size, worker age, and worker location.[3] Overall, the first two months of the pandemic recession in the United States amounted to the most severe economic decline in postwar history, with over 29 million jobs lost outright and millions more losing income from forcibly reduced hours. As of the end of the second quarter, GDP was expected to contract by 9.7% compared to Q2 2019, followed by a further 6.8% contraction in the third quarter.[4]

---

[3] Cajner, Tomaz et al. “The U.S. Labor Market During the Beginning of the Pandemic Recession.” Becker Friedman Institute Working Paper 2020-58. *University of Chicago*, May 2020. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202058-1.pdf

[4] Smialek, Jeanna. “The U.S. Entered a Recession in February.” *New York Times*, June 8, 2020. https://www.nytimes.com/2020/06/08/business/economy/us-economy-recession-2020.html



Job losses during the first two months of the "Pandemic Recession." Source: Cajner et al, 2020.

Yet countries worldwide have been hit with similar levels of economic pain, regardless of the containment policies they adopted. New Zealand, after having implemented one of the swiftest and most effective actions against the virus and emerging mostly unscathed from the other side, still announced its worst first quarter economic contraction in 29 years, with worse expected for the second quarter. Canada's annualized GDP plunged 9% in March despite mounting the most effective response to COVID-19 in North America. Brazil, whose government had prioritized maintaining economic growth above all other concerns, still reported an expected Q2 GDP decline of 7%, along with a towering 11% primary fiscal deficit.[5] And the Indian economy, already suffering from poor growth fundamentals, is forecasted to contract by 5% this fiscal year as a result of the pandemic according to S&P.[6]

Analysis of economic models which have been developed in order to identify the level of enforced social distancing necessary for optimal economic outcomes makes it clear why, despite what the prophets of reopening would claim, little can be done to restart an economy until the pandemic is under control. Even when no formal restrictions are put in place, many will reduce both their consumption and their work anyway by socially distancing at home out of fear of the

[5] McGeever, Jamie. "Brazil economy could fall 7%, deficit top 11% of GDP, Treasury secretary says." *Reuters*, June 24, 2020. https://www.reuters.com/article/us-brazil-economy-deficit/brazil-economy-could-fall-7-deficit-top-11-of-gdp-treasury-secretary-says-idUSKBN23V2GF

[6] "Economic Research: Asia-Pacific Losses Near $3 Trillion As Balance Sheet Recession Looms." *S&P Global*, June 26, 2020. https://www.spglobal.com/ratings/en/research/articles/200626-economic-research-asia-pacific-losses-near-3-trillion-as-balance-sheet-recession-looms-11549853

virus, particularly as infections grow more widespread in a particular area. Empirical studies of population movements with and without active social distancing policies demonstrate just how strong this incentive is. In a study published by the University of Chicago comparing consumer behavior within commuter regions straddling state boundaries with different shutdown policies, Goolsbee and Syverson found that out of an overall drop in consumer traffic of 60%, only 7% was attributable to stay at home orders.[7] The remainder was attributable entirely to individual decisions driven by fear, with consumers additionally shifting their activity away from busy retailers to emptier stores as a means of further reducing their risk of exposure. Fear of contracting the virus was, in fact, so widespread that even during the massive street protests which took place in June of this year, overall population movement in the New York area as measured by the displacement of cell phone GPS signals fell when compared to the period just before the protests.

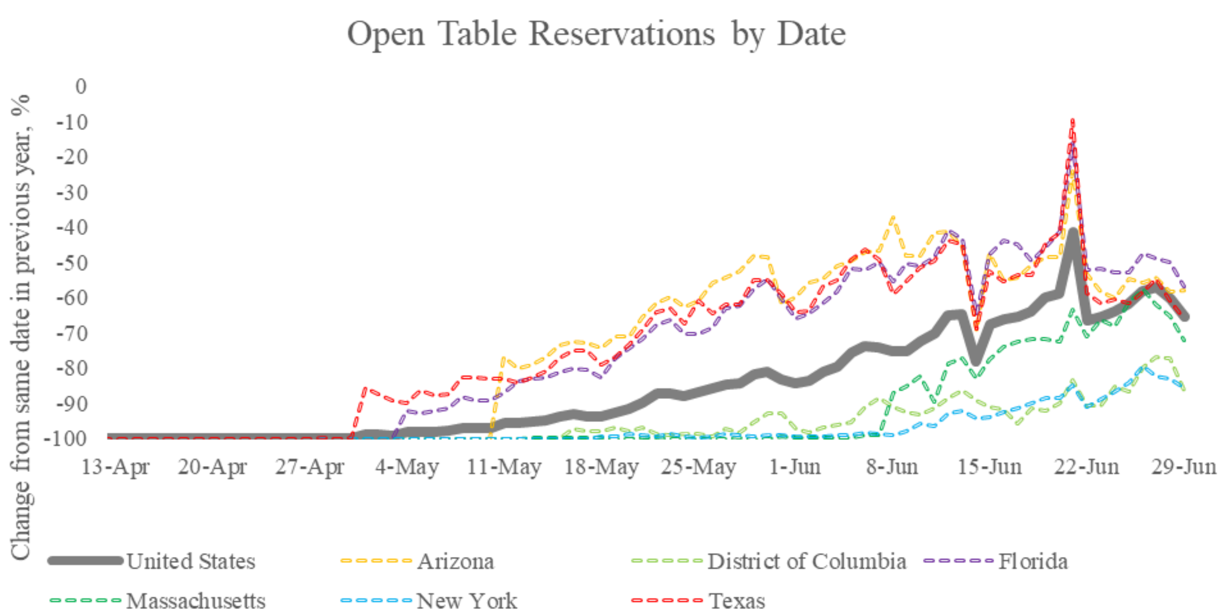
If formal stay at home orders make such a small impact on the overall behavior of the population, then why do they hold such importance? The first answer, illustrated by the aforementioned economic models, is that the equilibrium that results from the accumulation of entirely voluntary actions in this case is not socially optimal because infected individuals do not fully internalize the externalities they produce. An asymptomatic individual who remains contagious is still likely to continue traveling outside the home and infecting people without their knowledge in the absence of a stay at home order. Economically vulnerable individuals who do not have the privilege to leave their places of employment are likely to continue working whether or not they display symptoms, threatening to infect others as a result. And on occasion, symptomatic individuals who downplay the severity of the disease or simply choose not to care about the health of their neighbors may continue living life as normal without an enforced economic shutdown, risking other people's lives as a result. In each case, infected individuals do not or cannot fully take into account the social cost of giving someone else a deadly illness unless the choice is forced upon them.

The second major motivation for stay at home orders is that it incentivizes governments to open their full toolboxes for economic relief, reducing stress on businesses and the population and weakening the motivation to defy these orders and pursue normal economic activity. If the vast majority of the population is already under enforced isolation, and experiencing economic pain as a result, then the government has more political capital to advance relief measures to alleviate the pain these orders are perceived to have caused. In effect, stay at home orders acknowledge and legitimize the pain which would have been felt by a voluntarily socially distance population even in the absence of an order, providing a formal justification for policies to relieve this pain. In addition to direct economic support for consumers and businesses alike, these orders can also serve as the keystone of a comprehensive set of preventative and containment measures which would otherwise be rendered null by the continued free movement of individuals. When the general population is barred from in-person interaction, not only is there no additional economic cost to testing, tracing and quarantine measures which could take individuals out of the workforce in a non-lockdown scenario, but these measures are also rendered more effective by

[7] Goolsbee, Austan and Syverson, Chad. "Fear, Lockdown and Diversion: Comparing Drivers of Pandemic Economic Decline in 2020." *University of Chicago Becker Friedman Institute*, June 2020. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202080v2.pdf

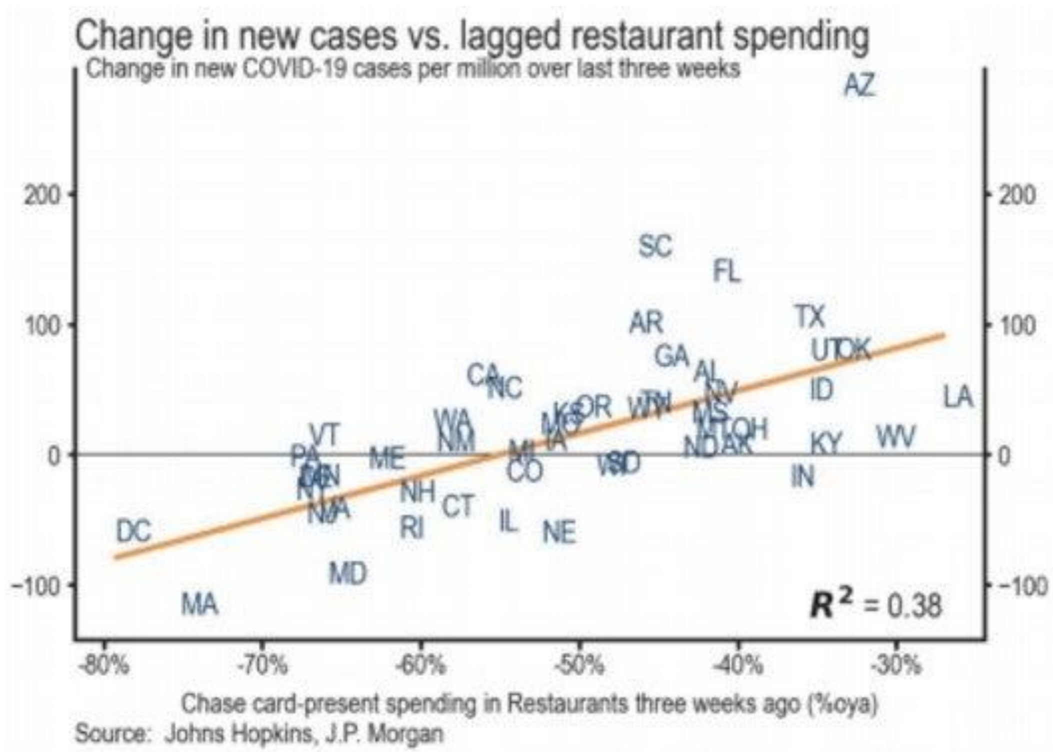
placing a hard ceiling on the number of interactions which can spread the virus further and make the job of containment harder. This shortens the overall period of lockdown required to reduce an area's caseload to a manageable level, allowing shuttered economies to reopen more quickly and reducing the overall economic pain incurred.

Last, but not least, shutdown orders reduce much of the fear and psychological pain which, while not measured by any formal economic metrics, without a doubt have a major impact on both the productivity and the overall well-being of the population. A lockdown provides a justification for vulnerable individuals not to be forced into the impossible choice between earning enough money to survive and sheltering from a horrible illness, especially when accompanied by economic support measures to meet basic needs. Placing an entire area under lockdown also produces a sense of solidarity and shared sacrifice, or the sense that one is not being forced to navigate an epochal crisis on one's own. The inevitable benefits to mental health resulting from this, compared to a scenario where every individual is made to fend for themselves by a government which forces them to assume the entirety of the cost and responsibility for surviving this pandemic, will result in unquantifiable improvements in happiness, well-being and efficiency of the workforce into the long term.



While restaurant reservations did not return to pre-pandemic levels following orders to reopen, the states which saw the greatest increases in reservations relative to the national average are also those currently experiencing the worst outbreaks. Source: OpenTable State of the Industry.

A cursory look at the restaurant industry in the United States offers a useful lesson on how even a minor premature reopening can send a region back to square one when it comes to tracing, containing and treating COVID-19. Restaurant reservations, a measurable proxy for in-person restaurant attendance, fell to a complete national standstill during the entirety of the month of April, during which local and state lockdown orders were in widespread effect. These orders were lifted on a state by state basis, freeing consumers to once again frequent restaurants which had been off limits. Latent fear of the pandemic kept most diners at home regardless of these orders, which means that restaurants have accepted fewer than half as many reservations as they did at this point last year despite the end of lockdowns. But even this limited economic activity was enough to bring the disease back in the states which most fully embraced reopening. According to a JPMorgan study, restaurant spending in a state, and in particular in-person restaurant spending as measured by Chase cardholder activity, was the strongest measured predictor of a rise of new infections in that state three weeks later. The evidence from this study aligns with the growing consensus that coronavirus transmission is far more likely indoors than outdoors, particularly when a mask is not in use. Interestingly, increased grocery spending was highly correlated with an absence of new infections, demonstrating the shifts in consumer demands taking place under lockdown.[8]



Spending data indicates a close lagged correlation between new COVID-19 cases and restaurant spending, itself a highly useful proxy for indoor in-person economic activities post-opening. Source: JPMorgan.

What level and duration of social distancing, then, will produce optimal outcomes for both public health and the economy? Eichenbaum et al (2020) attempt to answer this using a model which not only estimates the negative externality of travel by sick individuals, but also allows for increased mortality due to the degradation of the medical system over time, the possibility of a cure being developed for the disease, and the likelihood that a vaccine will eventually be produced and distributed on a universal basis. While each of the model responses discussed in

---

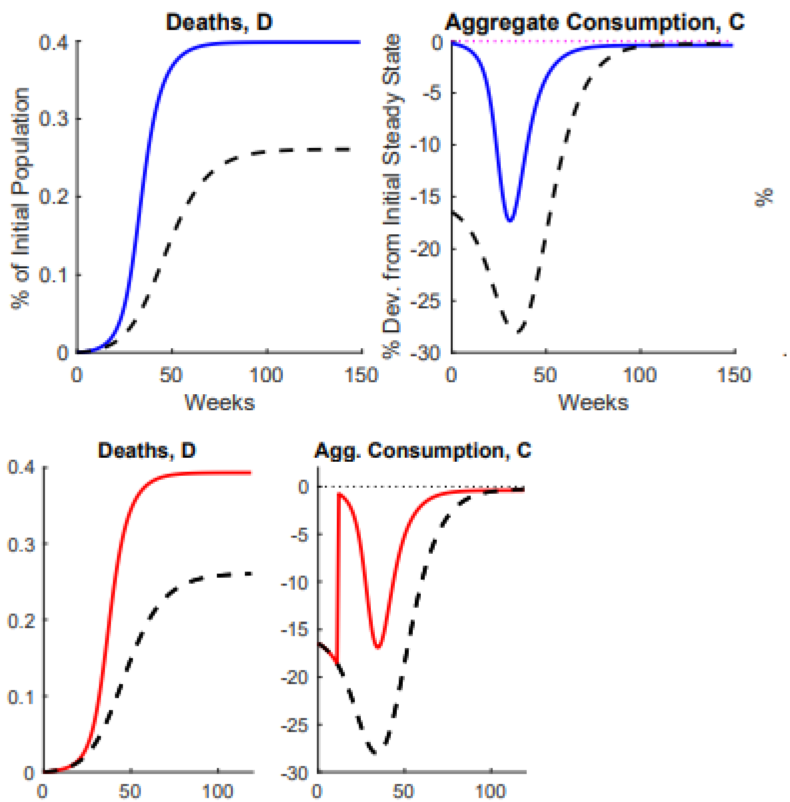
[8] Guerrero, Susana. "Higher restaurant spending could be linked to COVID-19 cases, study finds." *San Francisco Gate*, June 26, 2020. https://www.sfgate.com/food/article/Higher-restaurant-spending-could-be-linked-to-15369923.php

the Eichenbaum paper deepens the initial recession compared to a status quo response, they ultimately result in less economic pain than a laissez faire approach by reducing the permanent economic damages from such a steep death toll.

Under the baseline model, a United States which did not enforce any lockdowns and experienced a mortality rate of .5%, as was measured in South Korea, would see 60% of the population infected, resulting in a million deaths. Even if the only negative economic impacts of the disease were lost productivity from the sick and permanent reduction in the size of the work force from the death toll of the epidemic, the country would still experience a 1.5% decrease in consumption at the peak of the outbreak and a permanent .3% drop in both population and GDP. These assumptions, of course, are wildly optimistic, and in a refinement of the model in which infection probability impacts consumption and hours worked, aggregate consumption falls by 4.7% and hours worked fall by 9.8%. These individual decisions make little impact on the death toll, however, which continues to stand at just under 900,000. Once the epidemic's impact on the medical system is taken into account in the model, mortality sharply increases. An uncontrolled outbreak will not only overload the medical system, it will degrade its capacity as medical personnel become infected and unable to work. Taking this into account, an entirely uncontrolled pandemic would be expected to claim .4% of the US population, or 1.3 million lives.

An optimal containment policy under the model, which would start slowly and ramp up to reach a 76% containment rate at the peak of the epidemic, would reduce the death toll to .26% even under the pessimistic assumption that no cure or vaccine is developed before the end of the outbreak. In the US, this would mean saving half a million lives. Such a lockdown would however entail a drop in consumption of 22%, compared to 7% of the status quo, which would inevitably spark pressure for economic reopening in the absence of welfare policies. If such a premature reopening were to take place 12 weeks into containment, consumption would initially spike by 17%, but the resulting second wave of infection would plunge the economy into a second, persistent recession. Not only would abandoning containment provide no lasting economic benefits, in the absence of a cure or vaccine, it would actually result in just as many deaths as taking no action at all!

This, in fact, is precisely the course the Coronavirus has followed in the United States. The economy crashed as widespread lockdowns were adopted in March and April. 22 million Americans lost their jobs, with the unemployment rate peaking at 14.7% in April, the highest ever seen in the postwar period. Early reopenings have given an ephemeral boost to the economy. Payrolls added 4.8 million new workers in June, and unemployment returned to 11.1% - nowhere near the levels before the crisis, but a modest return to normal. However, these gains were temporary and doomed to fail. With these premature reopenings, undertaken before infection rates in many states had even peaked, let alone gotten under control, the virus returned with a vengeance. Many of the states that reopened are being forced to issue new shutdown orders, having lost virtually all of the hard-won progress they made from an extremely painful period of social distancing. Whether the population returns home out of fear or under the compulsion of policy, the economy will return back to its March-April nadir as the virus surges again, businesses close their doors, and consumers close their wallets. In the absence of a vaccine, all that a premature reopening can accomplish is a prolonging of recession and fear of infection. Some may have a long drawn out 'U' shaped recovery and others could have a 'W' shaped recovery.



Consumption and deaths under optimal containment (dashed line) vs. abandoned containment at 12 weeks (red) and no containment (blue). Source: Eichengreen et al.

Because this model does not account for the possibility of smart containment, in which a universal testing environment allows governments to rapidly identify, trace, and isolate those who have either come into contact or contracted the disease, it paints a somewhat more pessimistic picture than the likely reality. Furthermore, as society learns more about the disease, new strategies for coping with it are coming to the fore which could greatly reduce the health and economic danger which COVID-19 poses. For example, a recent Goldman Sachs report estimates that a nationwide mask mandate which increases mask wearing by 25% would reduce the daily growth rate of new infections from 1.6% to .6% and ultimately avoid the economic losses which would result from an economic shutdown with an equivalent effect, some 5% of GDP.[9]

[9] Ingraham, Christopher. "National mask mandate could save 5 percent of GDP, economists say." *Washington Post*, June 30, 2020. https://www.washingtonpost.com/business/2020/06/30/mask-mandate-gdp-economy-goldman-sachs/?utm_campaign=wp_main&utm_medium=social&utm_source=twitter

Ultimately, however, some degree of economic shutdown is inevitable if COVID-19 is to be fought with any lasting effect. The momentum for these shutdowns will only be maintained if economic policies to make them more bearable are introduced in concert with medical policies to allow them to pass as quickly as possible. In addition, if societies wish for a quick, V-shaped economic recovery from the pandemic, rather than a prolonged, painful U-shaped recovery, further economic policies must be introduced at the national level which target the unique pressures a pandemic places on household budgets, state and local budgets, vulnerable businesses, and vulnerable individuals.

Ongoing Economic Headwinds

Short-Term

Shelter-in-place orders place unique stresses on businesses, and wage-earners alike. Businesses, lacking revenues, lose the resources needed to meet existing obligations such as rent and payroll. Employees, if forced to leave their jobs or accept a suspension of pay due to economic shutdown, lose the earnings that would otherwise provide for basic necessities such as food, medicine, and shelter. While a stay at home order appears to freeze the economy in place, the web of liabilities which economic activity normally pays for continues to pile up. Ultimately, the only way to truly put the economy in stasis and provide for the security of these individuals and businesses is to undertake a coordinated state effort to meet their needs and provide for their welfare.

One model for supporting individuals is a temporary Universal Basic Income, or a monthly check which is provided to within an impacted area for the duration of the crisis. The United States has flirted with this idea by issuing a one-time stimulus check for 1200 USD to eligible individuals, comprising the majority of the population. This stimulus may have been grossly inadequate compared to the economic strains the pandemic forced on the population, but it still offered much-needed relief. In fact, largely as a result of the stimulus, gloomy predictions that the poverty rate would reach its highest rate in half a century[10] have seemingly been averted. One study even shows that despite being issued at the height of lockdowns, the stimulus dropped the poverty rate from 10.9% in January/February to 8.6% in April/May.[11] Democrats in the Senate have since gone further, proposing a monthly 2000 USD transfer to all individuals earning under 120,000 USD annually, retroactive to March and continuing until three months after the pandemic had been declared over by the Department of Health and Human Services.[12] This bill, however, is unlikely to pass the muster of the Republican-controlled Senate.

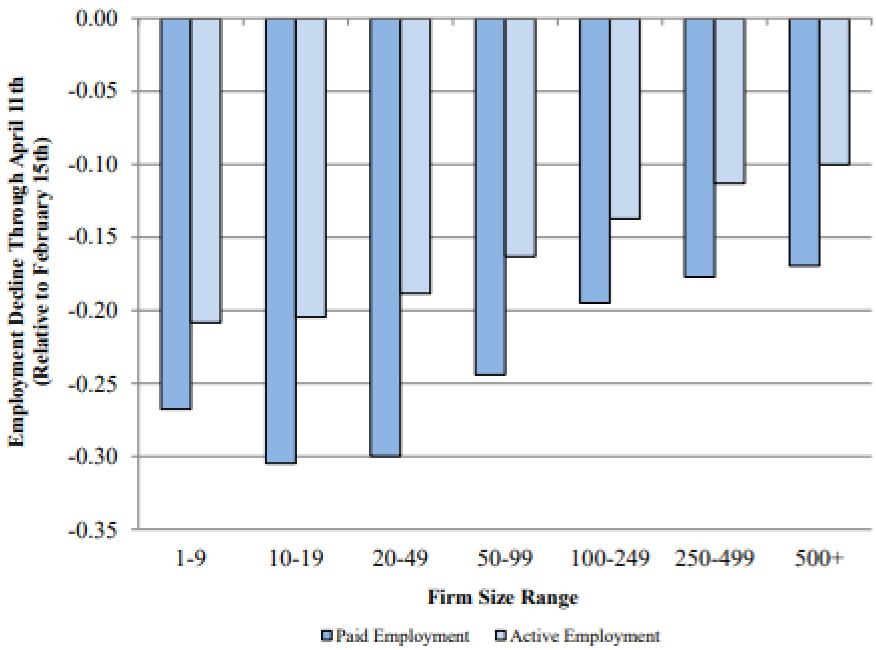
A separate model for supporting individuals and businesses simultaneously has been adopted various European countries. The government of Denmark has agreed to compensate 75% of the

[10] DeParle, Jason. "A Gloomy Prediction on How Much Poverty Could Rise." *New York Times*, April 16, 2020. https://www.nytimes.com/2020/04/16/upshot/coronavirus-prediction-rise-poverty.html
[11] Han, Jeehoon et al. "Income and Poverty in the COVID-19 Pandemic." *University of Chicago Harris School of Public Policy*, June 22, 2020. https://harris.uchicago.edu/files/brookings_paper2_5_clean.pdf
[12] Everett, Burgess. "Democratic senators propose $2,000 monthly payments to most Americans." *Politico*, May 8, 2020. https://www.politico.com/news/2020/05/08/monthly-payments-2000-coronavirus-243670

wages for private sector employees working for companies made vulnerable by the pandemic which would otherwise be forced to cut their payrolls.[13] The British government topped this by promising to pay 80% of wages for employers who do not lay off their employees, topping out at 2500 GBP monthly per worker. Such a policy achieves three separate goals. Most obviously, it offers a source of income for workers who may struggle to meet their daily needs if laid off, and provides businesses a way to meet the crushing burden of payrolls with no productivity to match. In addition, though, wage subsidy policies also preserve linkages between employers and employees which mass unemployment would erase. By doing so, countries which adopt these policies allow businesses to avoid the additional cost of finding, rehiring and retraining new workers, while employees do not have to sink time and resources into finding new jobs matching their experience levels and talents. An abnormally high rate of frictional unemployment which would slow the economic recovery once the end of the pandemic had been reached can therefore be averted.

The American analogue to these programs, the Paycheck Protection Program administered through the Small Business Administration (SBA), has been somewhat less successful due to its limited scope and reach. From the start, the PPP was plagued by a lack of resources and a bureaucratic application process which advantaged the well-connected business owners which were most likely to survive the crisis. As a result, many businesses had not yet gotten the relief provided to them at the national level by the time the PPP expired on June 30, although an extension of the program to August 8 has since been passed by the House and Senate. While the SBA offers various other means of assistance, such as emergency advances, disaster loans, bridge loans, and limited debt forgiveness, the piecemeal nature of these programs has made the process of navigating them persistently frustrating for small business owners.

[13] Buttler, Morten. "Denmark will compensate private wages to avoid virus layoffs." *Bloomberg*, March 15, 2020. https://www.bloomberg.com/news/articles/2020-03-15/denmark-will-compensate-private-wages-to-avoid-virus-layoffs

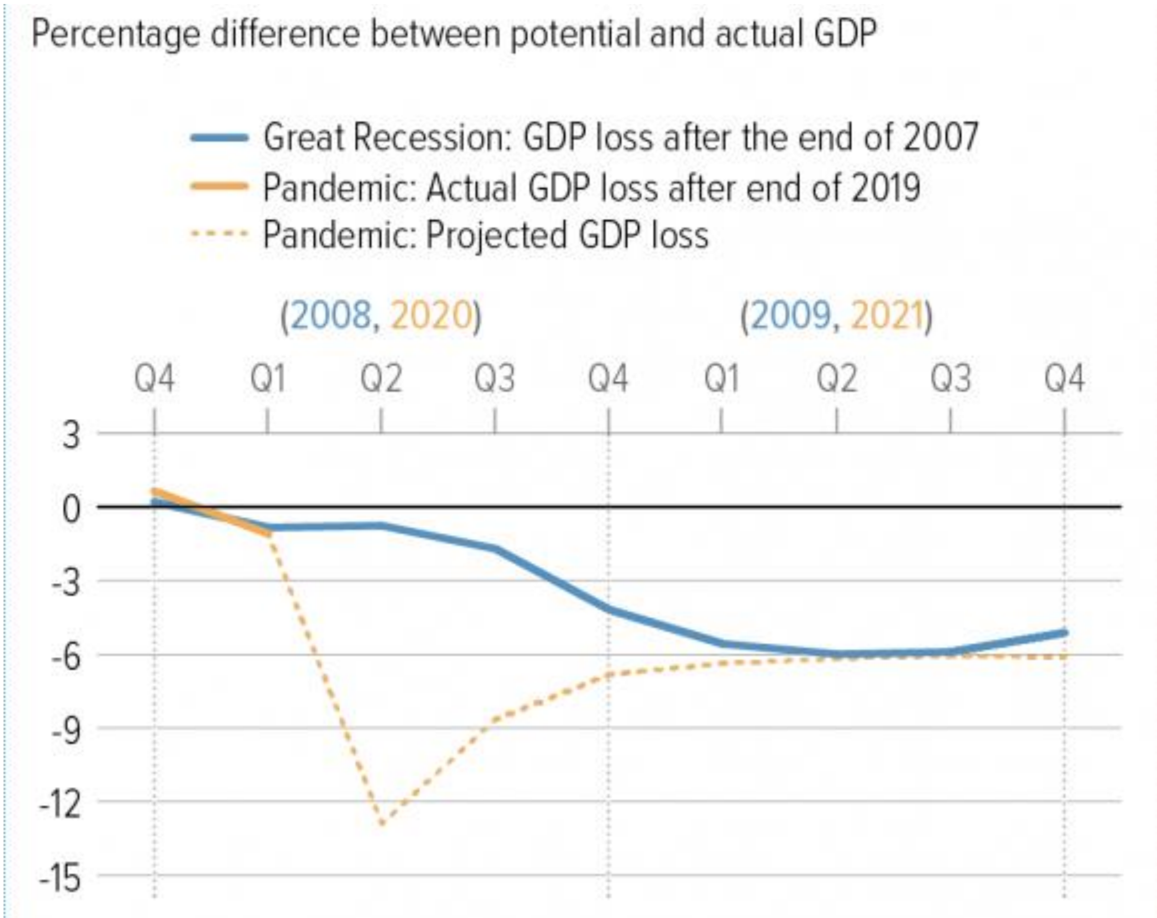


In the absence of effective wage protection programs, small businesses have been made to bear the brunt of the resulting unemployment crisis. Source: Cajner et al.

In the absence of a more functional wage subsidy program, many businesses have chosen to lay off their employees to relieve financial pressures, forcing these employees to turn to state and local governments for relief. State-operated unemployment insurance systems, many of which used obsolete 1960s-era technology, were utterly overrun within the first few weeks of lockdowns, leaving would-be applicants stranded on phone hotlines for days, weeks, and even months as financial aid remained stubbornly out of reach. Some municipalities even introduced their own emergency programs, such as the 15 million USD rental assistance program introduced in Harris County, Texas on July 1. Without federal support, however, subnational programs are virtually guaranteed to run out of funds given the universal scale of the COVID-19 crisis. Absent such support, many will be forced out of their homes in attempt to earn enough money to meet the basic needs of life, particularly in states whose governments do not enforce lockdown orders. Some may view the lack of federal support as a means to compel states and cities to reopen their economies, but when those people who are forced to seek employment before the conclusion of the pandemic ultimately get infected, the entire country will pay for the lack of foresight and vision in these federal economic programs. Drastic steps must be taken to support the immediate needs of the population to avoid this increasingly inevitable future.

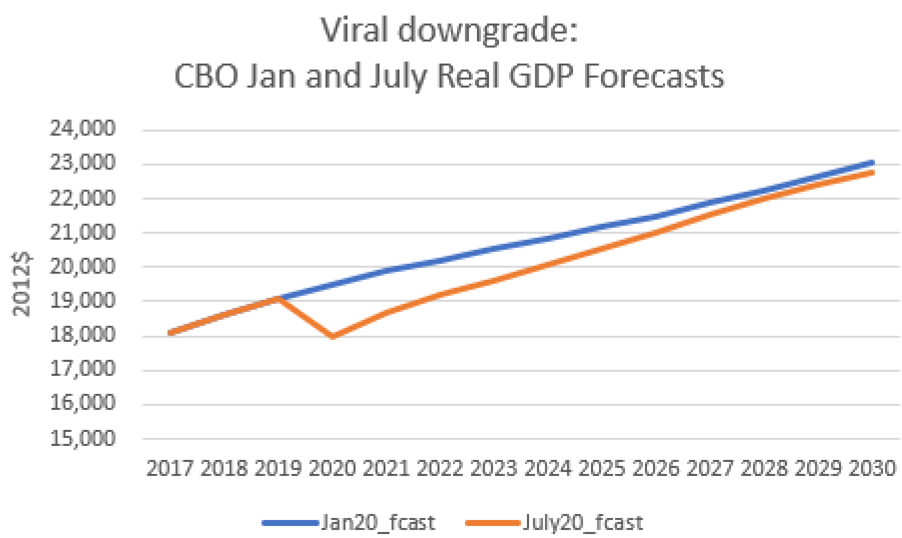
Long-Term

In an ideal world, economic recovery from COVID-19 would follow a V-shaped recovery. The economic fundamentals in the pre-virus world would remain the same once the outbreak had been suppressed, meaning that were the virus to disappear overnight, economic activity would instantly spring back to ordinary levels. However, few central governments have provided the policy support necessary to deliver such a recovery. Far from a V-shaped recession, or even a U-shaped recession with a prolonged trough of economic sluggishness, countries which have become mired in the pandemic for the long run may have to suffer through a grueling, decade-long slog as the numerous secondary economic crises touched off by the coronavirus coalesce into an intractable morass greater than the sum of its parts.



The COVID-19 recession threatens economic losses equaling or exceeding the damage wrought by the Great Recession unless policy measures are adopted to meet pressing economic needs. Source: Center on Budget and Policy Priorities.

The economic challenges which the COVID-19 pandemic has produced are not confined to the short-term. Rather, the pandemic has produced a series of interlocking crises in all countries afflicted which, absent meaningful policy decisions, will plague their economies for years to come. Namely, COVID-19 has forced a reckoning on household budgets, business stability, state and local budget solvency, and the capacity of human capital, the cumulative impact of which threatens to long outlive the virus itself. According to the Congressional Budget Office, if the United States remains on the current trajectory without additional changes, it will generate a total of 8 trillion less in real GDP through 2030 than it would have without the pandemic. Unemployment may take a decade to return to normal. Such a decline would dwarf the economic losses caused by the Great Recession of 2008.



Without policy action to shift the United States' economic trajectory, the COVID-19 pandemic will produce a lasting economic shortfall at the household level through the next decade. Source: Jared Bernstein, Center on Budget and Policy Priorities.

The Household Fiscal Cliff

The most personal of these four crises has been the accumulation of household debt. According to the CBO estimate, an estimated 12,000 USD of GDP per household will be lost in 2020 and an additional 10,000 USD in 2021, as a result of the pandemic. As stimulus funds run out and unemployment insurance expires, many households, will be forced to make the impossible economic choices that such a lack of resources dictates. The burden of this lack of financial support will fall on poor households, largely renters, whose occupants have disproportionately lost their jobs and lack the federal mortgage protections and additional assets to draw on of wealthier homeowners.

The plight of these households, forced to choose between rent and food amidst a national crisis, has sparked widespread calls for rent delays and strikes. Regardless of the outcome of these, economic devastation lurks around the corner. Evicting the countless families which are unable to pay their rents, or taking other collection actions against those who are unable to meet other debt payments, will create a secondary epidemic of hunger, homelessness, widespread suffering and lost potential. Yet mass withholding of rent payments would lead to conditions similar to those which caused the Great Recession. Even though the housing market's economic fundamentals had been strong at the onset of the pandemic, failure to offer adequate mortgage relief or debt forgiveness could lead to another wave of foreclosures and a repeat of the housing crisis which brought the global economy to its knees and took the better part of the past decade to fully recover from.

Mass Business Collapse

The collapse in consumer spending has threatened businesses throughout the economy with permanent shuttering. 100,000 small businesses in the United States have already been forced to close for good. The entertainment, food service and retail industries, heavily reliant on in-person consumption within indoor spaces, have experienced the most drastic hits, body blows which threaten to change the face of these industries for good. Although federal programs such as the PPP helped relieve some of the burdens these businesses faced, other liabilities, such as rent and outstanding inventory payments, were not covered under any such guarantees. Amidst the mass collapse of businesses that the COVID-19 crisis has prompted, 42% of employees released from their jobs are not expected to return to the same positions they held when and if their employers go back in business. These losses have been most heavily borne by small businesses, 54% of which have laid off employees, 52% of which expect to be out of business within six months, and 13% of which have reported a total loss of revenue. [14] [15] This is less an example of creative destruction than the wholesale erasure, with no replacement, of the relationships and intangible assets accumulated over decades on which the economy invisibly runs.

[14] Cajner et al. "The US Labor Market during the Beginning of the Pandemic Recession." *University of Chicago Becker Friedman Institute*, May 2020. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202058-1.pdf
[15] "Survey: COVID-19 Could Shutter Most Small Businesses." *Society for Human Resource Management*, May 6, 2020. https://www.shrm.org/about-shrm/press-room/press-releases/pages/survey-covid-19-could-shutter-most-small-businesses.aspx

Industry	Paid Employment Change: All	Hours Change: Continuing Hourly Workers
Arts, Entertainment and Recreation	-56.4%	-19.2%
Accommodation and Food Services	-52.9%	-18.6%
Other Services	-23.6%	-8.6%
Administrative and Support	-19.8%	-5.1%
Real Estate, Rental and Leasing	-19.8%	-5.8%
Transportation and Warehousing	-17.8%	-2.8%
Manufacturing	-17.5%	-8.0%
Information Services	-16.1%	-2.1%
Educational Services	-15.9%	-4.0%
Retail Trade	-13.3%	-10.0%
Construction	-12.9%	-4.3%
Health Care and Social Assistance	-12.9%	-3.4%
Wholesale Trade	-10.9%	-9.4%
Professional, Scientific, and Tech Services	-8.9%	-4.3%
Public Administration	-8.2%	-2.5%
Finance and Insurance	-3.3%	-0.9%
Agriculture	0.5%	-1.2%
Utilities	3.8%	-0.5%

Employment changes by two-digit NAICS industry, February 15 – April 11. Source: Cajner et al, 2020.

Along with the amount of consumption, the nature of consumption is also changing in an era of social distancing which is redefining the fields in which private enterprises can expect financial rewards. As in-person consumption of everything from education to entertainment becomes impossible, e-commerce has grown by leaps and bounds in ways which have left many businesses unable to adapt. Elsewhere, collapsing commodity prices in the energy and agriculture industries have laid the foundations for significant regional economic damage, especially for the manufacturing industries which supply equipment that harvests these commodities. While the former phenomenon should be seen as an acceleration of trends which would have taken place over the course of this decade regardless, businesses which lack the resources to invest in making the necessary adaptations will be left unable to reap the rewards of these changes and will remain as vulnerable as before.

State and Local Budget Crises

The third pending crisis faced by countries whose national governments have committed insufficient resources to managing the pandemic recession will be a wave of insolvencies at the state and local level. These subnational governments lack the fiscal flexibility of national governments, and have limited authority to issue debt to fund operations at a time when major revenue streams such as sales taxes and hotel taxes which these governments rely on are in freefall. Without financial aid for these struggling governments, they will be forced to cut operations at a time when smoothly functioning local government is most needed and to lay off public workers, causing catastrophic unemployment in the public sector to match the damage which has already occurred in the private sector.

While some officials have called on state and local governments to practice fiscal responsibility rather than requesting federal aid, such calls ring hollow when revenue streams have dried up at the same time that state and local governments are attempting to provide the relief that the federal government has not issued itself. Under mounting budgetary pressures, some states and municipalities have already been left with no alternative but to release employees. Schools nationwide, operated at the local level, have already eliminated 500,000 positions, more than were lost in the entirety of the Great Recession.[16] Once rainy day funds are completely depleted, the even more punishing budget cuts which will result by necessity will cause great unnecessary economic pain and unnecessarily slow the economic recovery, an outcome which could easily be averted with federal intervention.

Human Capital

Finally, the economic disruptions caused by the disease, as well as the disease itself, have already severely damaged the health and well-being of impacted populations. At this point, the long-term health effects of contracting COVID-19 are unknown, but if they are severe, they could cripple the employment prospects of low-wage workers in low-skill industries, themselves disproportionately exposed to the virus, whose jobs demand physical labor. Knowledge industries are likely to be damaged by skill erosion from the countless workers who, after having been laid off and having gone without relevant employment for a lengthy period of time, will have been unable to maintain employable skills which would allow them to seamlessly return to their original industry. And, most tragically of all, the knowledge, skills, and experiences of those who are claimed by the virus will disappear with them.

Monetary Policy

The many points of economic pain discussed in the prior sections do not simply stay confined to do damage within the sectors where they originate. Their damage ripples throughout the economy and especially the financial system. If debt payments are missed and banks find themselves insufficiently capitalized to meet lending needs, the financial system could find itself under the threat of a 2008-style collapse. Particularly vulnerable are the regional and community banks which hold a greater proportion of the specific assets jeopardized in this crisis such as industrial and commercial real estate loans and loans to small and midsized businesses.

---

[16] Lowrey, Annie. "The Second Great Depression." *The Atlantic*, June 23, 2020. https://www.theatlantic.com/ideas/archive/2020/06/second-great-depression/613360/

Fortunately, economic policymakers around the world are already well-versed in the steps needed to rescue a fragile financial industry from mass default, having navigated the worst financial crisis since the Great Depression a decade ago. In the United States, the Federal Reserve has already implemented most of the extraordinary measures which were used to rescue the American financial system during the 2008 crisis. After immediately cutting the target for the federal funds rate to 0% in early March, the central bank expanded its direct holdings of securities from 3.9 trillion USD to 6.1 trillion by mid-June, making an open-ended guarantee to buy securities "in the amounts needed to support smooth market functioning and effective transmission of monetary policy to broader financial conditions."[17] The Fed has also invoked emergency lending authority to "primary dealer" financial institutions, saving credit markets from the threat of cash hoarding, and has reduced rates for discount window lending to banks to .25%, lower than during the Great Recession. In a series of unprecedented moves, the Fed has also started lending directly to major corporate employers, small and mid-sized businesses, and state and municipal governments for the first time.

The actions of the Federal Reserve have rescued the United States from much of the financial damage which would have resulted from the pandemic recession, and have even filled in for some of the failures of American fiscal policy during the current crisis. But not all countries have the flexibility to freely apply monetary policy in the same way that the United States, owner of the world's reserve currency, is able to wield it. In nearly every other country, fiscal policy must be more heavily relied upon.

The policy measures for avoiding these overlapping crises are simple in their approach. They may vary according to the needs of individual industries and the scale of relief, but the basic principles involve eliminating or guaranteeing outstanding liabilities, providing alternate streams of income for sustenance, and preparing businesses and the workforce to resume normal operations when the time is right as smoothly as possible. Specifically, unemployment insurance should be extended and expanded for fired workers. Public debts held by businesses and individuals should be deferred until after the end of the crisis or forgiven entirely, while private debts should be deferred or temporarily assumed by the government where possible. Cash grants should be issued on a regular and universal basis for the duration of the crisis, and direct federal aid should be granted to fill the emergent budget gaps of subnational governments. And formal public support should be announced for unemployed workers to maintain marketable skills through online training and continuing education programs. But political will, not feasibility, will be the deciding factor as to whether or not these policies, proven impactful in the countries which have successfully wrestled COVID-19 into submission, will be adopted. Once an outbreak has spread throughout a country, it becomes a national problem. And national problems require national solutions.

[17] https://www.brookings.edu/research/fed-response-to-covid19/

A Newly Sustainable Future

For the United States, the danger doesn't stop at an unnecessarily slow economic recovery. The longer the catastrophic response to the pandemic continues, the more the weakness of American institutions will be revealed to the international community. Since the end of World War II, much of American power has been predicated on the perceived strength of these institutions. Before the pandemic, weaknesses such as crumbling infrastructure, a wildly inefficient healthcare system, a paralyzed political system, and the persistent failure to create equal opportunity and widespread economic security through the tax and welfare state could be dismissed as separate from each other. Now that these institutional failings have interacted to produce the apparent institutional apathy which threatens millions of American lives today, the perception of power serving as the linchpin of America's international standing appears due for a correction.

Absent a rapid change in affairs, one of the long-term outcomes of the Coronavirus could be a permanent decline in the well-being and international competitiveness of the United States. The same institutional failures which have defined the near-absent response to the Coronavirus plague many other factors driving American decline, such as exorbitant housing costs, endemic gun violence, racial inequity, nativism, and urban decay. Unless these institutional failings are dealt with, the outcome of these trends will be a flight of skilled workers, relocation of investment, and declining quality of life, which itself will force cuts which perpetuate this negative cycle. If capital flight continues long enough, investors may lose confidence in the United States as a financial hub, and may even call the dollar's status as the world's reserve currency into question. If this happens, the resulting currency crash would spark a period of high consumer prices and severe stagflation which could even lead to a broader collapse.

The economic realities of the COVID-19 pandemic appear overwhelmingly bleak. Yet even this crisis has a silver lining. The points of failure which have revealed themselves over the course of this crisis happen to be precisely those which have inhibited countries, including the United States, from adopting and wholeheartedly pursuing a path of sustainable development. If countries are to navigate the pandemic without an exorbitant loss of life or wealth, they by necessity must adopt many of the measures called for in the Sustainable Development Goals, either as a direct initiative against the virus or as a byproduct of efforts to fight it. When maintaining a business as usual approach, enough to coast by in ordinary years, represents nothing so much as so many millions dead, countries have never had a greater incentive to set themselves on the road to a sustainable future. Those that choose this path, and muster the initiative to continue along it once COVID-19 has been conquered, will harvest the fruits: a meaningful end to poverty, universal and comprehensive healthcare systems, inclusive institutions and societies, reduced pollution, and novel partnerships that spark innovation. Those that do not will reap only economic decline, a swollen death toll, and permanently lost competitiveness upon their reemergence into the world.

Sustainable Development Responses to the Coronavirus

Sustainable Development Goal	Example Initiatives
No Poverty	Wage subsidy programs; direct cash payments; Universal Basic Income (UBI)
No Hunger	Food system reforms to minimize the threat of zoonotic diseases
Good Health and Well Being	Affordable and universal healthcare; telemedicine for preventative care, including mental health; development and refinement of automated contact tracing systems to prevent future widespread outbreaks; advances in rapid vaccine and treatment development
Quality Education	Refinement of best practices for online teaching; development of high-quality online materials appropriate for all student contexts
Decent Work and Economic Growth	Meaningful options for remote work; improved norms surrounding work-life balance; reinforcement of labor rights
Industry, Innovation and Infrastructure	Decentralized and flexible manufacturing supply chains; stronger internet and digital infrastructure; renewed focus on R&D and knowledge sharing
Reduced Inequalities	Revitalized social safety nets; reduced disparities in access to healthcare and quality education; new fiscal, wage and social protection policies
Sustainable Cities and Communities	Reassessment of the use of urban space; reduced traffic burdens and air pollution; investments in protecting vulnerable urban communities
Climate Action	Improved anti-GHG initiatives, refined by knowledge and research from reduced air pollution during shutdowns
Life on Land	Efforts to preserve rebounds made by animal species during period of reduced noise and human activity
Peace, Justice and Strong Institutions	Involving citizens in policymaking through e-government; eliminating racial disparities in health and well-being revealed by COVID-19; identifying alternatives to imprisonment

Policies introduced to provide for the basic needs of a population under siege have provided thrilling proofs of concept for how poverty can be eliminated as the deliberate policy choice which it is. The direct income transfers incorporated into the CARES Act, despite the many flaws of the economic stimulus package, have already been successful at reducing poverty to pre-crisis levels despite the myriad sources of economic stress the pandemic has created.[18] If

[18] Parolin, Zachary et al. "The CARES Act and Poverty in the COVID-19 Crisis." *Columbia University Center on Poverty and Social Policy*, June 21, 2020. https://www.povertycenter.columbia.edu/news-internal/coronavirus-cares-act-forecasting-poverty-estimates

similar transfers were made permanent in a time of economic plenty, wealthy countries could expect to witness the final elimination of poverty. Advances in online education, prompted by the necessity of conducting primary, secondary and tertiary education outside the classroom, could also pave the way for a society in which unequal access to quality education no longer remains a barrier to social or economic mobility.

Never have universal healthcare systems proven their worth more than during the COVID-19 pandemic, and never has there been a more politically viable pathway towards implementing a universal healthcare system than right now. Countries whose populations can rely on strong public healthcare systems will thrive compared to those that do not in the years after the pandemic. As their citizens avoid the staggering debts and even medical bankruptcies endemic to countries without such strong support, these countries will be able to mobilize the additional savings and investment necessary to build an even more resilient society. Countries which do not have such systems, even if they are loathe to disrupt entrenched interests, can plant the seed for a universal healthcare system by incorporating all COVID-19 patients under a special public insurance vehicle. Given the similar demands faced by patients who suffer the same disease en masse, such an approach would be cost-effective, efficient, and would eventually build up to such a scale that a larger public health insurance system could be built on top of it.

Countries which have contained the pandemic have used it as an opportunity to strengthen their social contracts, as opposed to shredding them. Bolstering the transparency of government decision making has been an excellent way both to engage citizens and to expand the range of expertise which can be applied to solving the problems that arise. Taiwan’s digital democracy platform has been a model of inclusive e-governance during the coronavirus outbreak, coordinating volunteer initiatives, spreading government notifications, and even organizing a PPE manufacturing drive. Similar, far lower-tech initiatives in other countries, such as livestreamed meetings of medical task forces, have allowed populations to inclusively engage with their governing institutions as never before. At a far more basic level of inclusion, the coronavirus outbreak has also produced massive pressure in the United States for the release of prisoners, one of the most susceptible groups to infection in the country with the world’s highest incarceration rate.

Finally, declines in transportation caused by lockdown measures have dramatically cleaner air in many parts of the world. This has offered millions of people a literal view of a future in which environmental pollution is taken seriously - in late May, for example, Mount Everest was visible from Kathmandu for the first time in living memory. Air pollution from car exhaust in Seattle, Los Angeles, and New York, was reduced by an average of 30% as a result of stay-at-home orders. In fact, lockdowns globally were responsible for reductions in nitrogen dioxide, ozone and PM2.5 pollution that potentially avoided 7400 premature deaths from respiratory diseases during the first three months of the year.[19] The changes in work and living patterns which have resulted from lockdowns have the potential to last, meaning some proportion of this reduction in pollution could be permanent. Further and more widespread environmental advocacy is also a

---

[19] Venter, Zander S. et al. “COVID-19 Lockdowns cause global air pollution declines with implications for public health risk.” https://doi.org/10.1101/2020.04.10.20060673

likely legacy of the clean air which many have experienced for the first time. Finally, the simultaneous and widespread nature of many lockdowns have offered researchers a perfect set of natural experiments to understand the changes the atmosphere would undergo in a decarbonizing world. Such knowledge is invaluable as global society mobilizes to halt climate change.

Much more must be done not just to make society more resilient to pandemics, but to attempt to prevent them altogether. Safer livestock handling processes, for instance, would go a long way towards limiting the transmission of zoonotic diseases. So would encouraging dense, sustainable cities in parts of the world Africa where population growth is likely to lead to expansion into wild areas where new zoonotic diseases are likely to emerge.[20] For now, though, encouraging the practice of sustainable development could be the best way both to escape the COVID-19 crisis and to prepare for the many new challenges which the 21st century will present. The stakes have never been clearer.

[20] "Pandemic-proofing the planet." *The Economist*, June 25, 2020. https://www.economist.com/science-and-technology/2020/06/25/pandemic-proofing-the-planet

Bibliography

Alvarez, Fernando E. et al. "A Simple Planning Problem for COVID-19 Lockdown." NBER Working Paper 26981. *National Bureau of Economic Research*, April 2020. https://www.nber.org/papers/w26981.pdf

Buttler, Morten. "Denmark will compensate private wages to avoid virus layoffs." *Bloomberg*, March 15, 2020. https://www.bloomberg.com/news/articles/2020-03-15/denmark-will-compensate-private-wages-to-avoid-virus-layoffs

Cajner, Tomaz et al. "The U.S. Labor Market During the Beginning of the Pandemic Recession." Becker Friedman Institute Working Paper 2020-58. *University of Chicago*, May 2020. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202058-1.pdf

DeParle, Jason. "A Gloomy Prediction on How Much Poverty Could Rise." *New York Times*, April 16, 2020. https://www.nytimes.com/2020/04/16/upshot/coronavirus-prediction-rise-poverty.html

Duda, Jeremy et al. "How Arizona 'lost control of the epidemic.'" *Washington Post*, June 25, 2020. https://www.washingtonpost.com/health/how-arizona-lost-control-of-the-epidemic/2020/06/25/f692a5a8-b658-11ea-aca5-ebb63d27e1ff_story.html

"Economic Research: Asia-Pacific Losses Near $3 Trillion As Balance Sheet Recession Looms." *S&P Global*, June 26, 2020. https://www.spglobal.com/ratings/en/research/articles/200626-economic-research-asia-pacific-losses-near-3-trillion-as-balance-sheet-recession-looms-11549853

Eichenbaum, Martin S. et al. "The Macroeconomics of Pandemics." NBER Working Paper 26882. *National Bureau of Economic Research*, April 2020. https://www.nber.org/papers/w26882.pdf

Everett, Burgess. "Democratic senators propose $2,000 monthly payments to most Americans." *Politico*, May 8, 2020. https://www.politico.com/news/2020/05/08/monthly-payments-2000-coronavirus-243670

Goolsbee, Austan and Syverson, Chad. "Fear, Lockdown and Diversion: Comparing Drivers of Pandemic Economic Decline in 2020." *University of Chicago Becker Friedman Institute*, June 2020. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202080v2.pdf

Guerrero, Susana. "Higher restaurant spending could be linked to COVID-19 cases, study finds." *San Francisco Gate*, June 26, 2020. https://www.sfgate.com/food/article/Higher-restaurant-spending-could-be-linked-to-15369923.php

Han, Jeehoon et al. "Income and Poverty in the COVID-19 Pandemic." *University of Chicago Harris School of Public Policy*, June 22, 2020. https://harris.uchicago.edu/files/brookings_paper2_5_clean.pdf

Huang, Chye-Ching et al. "Putting the Size of the Needed COVID-19 Fiscal Response in Perspective." *Center on Budget and Policy Priorities*, May 4, 2020. https://www.cbpp.org/research/federal-budget/putting-the-size-of-the-needed-covid-19-fiscal-response-in-perspective

Ingraham, Christopher. "National mask mandate could save 5 percent of GDP, economists say." *Washington Post*, June 30, 2020. https://www.washingtonpost.com/business/2020/06/30/mask-mandate-gdp-economy-goldman-sachs/

Irwin, Neil. "Why Economic Pain could Persist Even After the Pandemic is Contained." *New York Times*, May 11, 2020. https://www.nytimes.com/2020/05/11/upshot/virus-lasting-economic-effects.html

Lowrey, Annie. "The Second Great Depression." *The Atlantic*, June 23, 2020. https://www.theatlantic.com/ideas/archive/2020/06/second-great-depression/613360/

McGeever, Jamie. "Brazil economy could fall 7%, deficit top 11% of GDP, Treasury secretary says." *Reuters*, June 24, 2020. https://www.reuters.com/article/us-brazil-economy-deficit/brazil-economy-could-fall-7-deficit-top-11-of-gdp-treasury-secretary-says-idUSKBN23V2GF

Open Table State of the Industry. https://www.opentable.com/state-of-industry

"Pandemic-proofing the planet." *The Economist*, June 25, 2020. https://www.economist.com/science-and-technology/2020/06/25/pandemic-proofing-the-planet

Parolin, Zachary et al. "The CARES Act and Poverty in the COVID-19 Crisis." *Columbia University Center on Poverty and Social Policy*, June 21, 2020. https://www.povertycenter.columbia.edu/news-internal/coronavirus-cares-act-forecasting-poverty-estimates

Rolander, Niclas et al. "Sweden in 'Very Deep Economic Crisis' Despite Soft Lockdown." *Bloomberg News*, May 19, 2020. https://www.bloomberg.com/news/articles/2020-05-19/sweden-in-very-deep-economic-crisis-despite-soft-lockdown

Smialek, Jeanna. "The U.S. Entered a Recession in February." *New York Times*, June 8, 2020. https://www.nytimes.com/2020/06/08/business/economy/us-economy-recession-2020.html

"Survey: COVID-19 Could Shutter Most Small Businesses." *Society for Human Resource Management*, May 6, 2020. https://www.shrm.org/about-shrm/press-room/press-releases/pages/survey-covid-19-could-shutter-most-small-businesses.aspx

Venter, Zander S. et al. "COVID-19 Lockdowns cause global air pollution declines with implications for public health risk." https://doi.org/10.1101/2020.04.10.20060673