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# THE LAW, ECONOMICS, AND GOVERNANCE OF GENERATION COVID-19 LONG-HAUL

JULIA PUASCHUNDER\* & MARTIN GELTER\*\*

## ABSTRACT\*\*\*

The SARS-CoV-2 novel coronavirus is an external shock to all societies with lasting impacts that have changed individual, political, and corporate decisions profoundly. Increasing evidence reveals that an estimated 10-50% of those previously infected with COVID-19 face a longer-term or long-term health impact and/or chronic debilitation that in many cases comes and goes in waves. This phenomenon has already been referred to as a pandemic within the pandemic. The broad-based and long-term impact of COVID Long Haulers have also holds the potential to change our world and modern society, lasting through the following three outlined speculative trends:

(1) The coronavirus crisis has widened novel and already existing inequalities, of which the rather surprising finance performance versus real economy liquidity constraint gap led to unequal emotional and socio-psychological crisis fallout propensities. Corporate governance and political economy power dynamics may shift in the eye of Long Haulers' relation to work and a healthy, productive environment. Employers will likely face pressure to create a safe and secure working environment but also have rising tort liability risks that may be mitigated by hiring health consulting agents. Proactive care for maintaining a healthy workforce and the overall long-term well-being of employees, including preventive care in teams, will become an essential corporate feature to attract qualified labor, whose bargaining power increased in the eye of labor shortages in direct contact industries and positions.

(2) Long Haulers may initiate an artificial intelligence revolution of self-

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\*\*\* For helpful comments on ideas that led to this Article, we thank participants of the 16<sup>th</sup> Annual Conference of the Italian Society for Law and Economics (SIDE-ISLE); the United Nations *Unequal World Conference: The Right to Education: Transforming the World Through Inclusive Quality Education*; The Research Association for Interdisciplinary Studies (RAIS) conference; University of Ohio, Moritz College of Law, Ohio State Business Law Journal Symposium *Confronting Crisis: Preparing for the Unexpected*; the Monitoring and Evaluation (M&E) Collaborative Association (MECA) 2021 Conference; the European Commission Directorate-General Health and Food Safety; the Comparative Private Law Lecture, Universität Innsbruck & Università degli Studi di Padova Scuola di Giurisprudenza; Centre for Corporate Sustainability and Environmental Finance, Department of Applied Finance, Macquarie Business School; Indian Institute of Finance *International Research Conference & Award Summit*; Council of European Studies (CES) 27<sup>th</sup> Annual *Conference of Europeanists*, the EcoWellness Group, and the 6<sup>th</sup> Annual International Conference Digital Czech Republic 2021.

monitoring and constant health status tracking, but also democratization of healthcare information. Artificial intelligence, robotics, and big data offer essential complements to fill in for long-haul attention and productivity deficits that may occur in waves. Long Haulers have already found themselves in online self-help groups – such as Survivor Corps – for quick and unbureaucratic information exchange about an emerging group phenomenon. Social online media platforms served as an easy remedy during a time when a surge of severe COVID cases precluded COVID hospitalization. Nowadays, COVID long-haul patients have become – more than ever before – citizen scientists that bundle decentralized information on their health status and potential remedies in order to inform the medical profession about newly emerging trends. The rise in medical self-help and mutual support will have profound implications for the regulation of the medical profession and will likely stretch the medical remedy spectrum and boost alternative medicine. In the online exchange of sensitive information about one's health status, citizen scientists are also particularly vulnerable in terms of their privacy, potentially even more susceptible to online marketing campaigns under medically impaired conditions, but also because of their sensitive information having been publicly disclosed online over time.

(3) As historical precedents show, Generation COVID Long-Haul partially being recognized as a disability may result in increased pressures to reform social, healthcare, and retirement systems. Given waves of debilitation, the analysis of macroeconomic aggregates will have to change in order to reflect a more diversified and temporal view of social preferences. Future economic policy research may take inspiration from the legal concept of disparate impact. Behavioral insights on how to navigate the world with attention deficits and uncertainty may focus on developing an idea of the economic benefits of rest by incorporating preferences for minimalism in a turbulent world longing for recovery.

## I. INTRODUCTION

The novel coronavirus that first emerged in 2019 is perhaps the most unexpected global shock in the modern era. COVID-19 dramatically changed behavioral patterns around the world and will have a lasting impact on society.<sup>1</sup> By now, over 250 million recorded infections<sup>2</sup> have caused over 5 million

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1. See *ECONOMICS IN THE TIME OF COVID-19* (Richard Baldwin & Beatrice Weder di Mauro eds., 2020), <https://cepr.org/sites/default/files/news/COVID-19.pdf> [<https://perma.cc/G3X7-QUN5>] (giving a general overview of the crisis and economic fallout).

2. This figure includes multiple infection counts but excludes those infected, who did not test for a COVID-19 infection.

documented deaths<sup>3</sup> in more than 220 countries and territories around the globe.<sup>4</sup> According to estimates, the actual number of infections is four to thirteen times the reported and recorded case numbers.<sup>5</sup> Without even considering the variants that have emerged, early scientific estimates predicted that about 80% of the world's population would get infected with the virus at some point, with the greatest impact in densely populated areas.<sup>6</sup> With the initial virus being replaced by different variants, epidemiologists increasingly believe that all human beings will have touchpoints with COVID at some point in their lives.<sup>7</sup>

Over the course of the spread of the novel coronavirus, people around the world have become aware that taking preventive measures can limit the spread of the deadly and debilitating virus – including social distancing and social contact tracking, collective and individual hygiene, preventive healthcare and foresighted nutrition, as well as vaccination and medication.<sup>8</sup> The further the

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3. Mortality count varies by country, but in general includes all who were tested as infected at the moment of death. The figure does not count for death due to coronavirus externalities, such as suicide without infection, those who died without having COVID-19 but did not get medical attention, or help due to hospital capacity constraints or delayed medical attention.

4. See *Coronavirus Cases*, WORLDOMETER, <https://www.worldometers.info/coronavirus/> [https://perma.cc/9BMJ-FDKH] (last visited Dec. 28, 2021).

5. Deidre McPhillips, *Study Estimates US COVID-19 Infections May Be 4 Times Higher Than Reported*, CNN (Jan. 5, 2021, 11:14 AM), [https://www.cnn.com/world/live-news/coronavirus-pandemic-vaccine-updates-01-05-21/h\\_833be27384fd892bf390e72fe3f34b1e](https://www.cnn.com/world/live-news/coronavirus-pandemic-vaccine-updates-01-05-21/h_833be27384fd892bf390e72fe3f34b1e) [https://perma.cc/2CR7-A52P]; Nurith Aizenman et al., *Coronavirus by the Numbers: Why the Pandemic is 10 Times Worse Than You Think*, NPR (Feb. 6, 2021, 5:01 AM), <https://www.npr.org/sections/health-shots/2021/02/06/964527835/why-the-pandemic-is-10-times-worse-than-you-think> [https://perma.cc/WEF7-3SB4]; Apoorva Mandavilli, *Coronavirus Infections Much Higher Than Reported Cases in Parts of U.S., Study Shows*, N.Y. TIMES, <https://www.nytimes.com/2020/07/21/health/coronavirus-infections-us.html> [https://perma.cc/2BFF-N25Q] (last updated Aug. 17, 2020).

6. See *'50-80% of Population' Could Be Affected by Coronavirus*, BBC NEWS (Mar. 2, 2020), <https://www.bbc.com/news/av/uk-scotland-51711747> [https://perma.cc/7LA9-2S27]; Jungsik Noh & Gaudenz Danuser, *Estimation of the Fraction of COVID-19 Infected People in the U.S. States and Countries Worldwide*. 16 PLOS ONE 1 (2021).

7. Sarah Zhang, *The Coronavirus is Here Forever. This is How We Live With It*, ATLANTIC (Aug. 17, 2021), <https://www.theatlantic.com/science/archive/2021/08/how-we-live-coronavirus-forever/619783/> [https://perma.cc/9U5F-6WJJ].

8. *How Scientists Predict How Many People Will Get COVID-19*, WEBMD (Apr. 1, 2020), <https://www.webmd.com/lung/news/20200401/how-scientists-predict-how-many-people-will-get-covid-19#1> [https://perma.cc/P6GP-RKA7]; Arielle Harrison, *70% of COVID Long Haulers Have Impaired Organs Up to 4 Months After Infection, Study Finds*, KUTV (Apr. 27, 2021), <https://kutv.com/news/local/70-of-long-haulers-have-impaired-organs-up-to-4-months-after-covid-19-infection> [https://perma.cc/85LF-AJXB]; Robert Roy Britt, *New Survey Identifies 98 Long-Lasting Covid Symptoms*, ELEMENTAL (Aug. 14, 2020), <https://elemental.medium.com/new-survey-identifies-98-long-lasting-covid-symptoms-87935b258a3e> [https://perma.cc/6VSU-P5DZ]; Julia M. Ptaschunder, *Generation COVID-19 Long Haulers*, SCIENTIA MORALITAS CONF. PROC., Apr.

COVID-19 healthcare crisis deepened, the more it became apparent that in some previously-infected individuals the virus lingers to the point of debilitation and often changes health conditions long term. From 10% to upwards of 50% of those previously infected with COVID develop long-term symptoms of the disease, which are often diffuse, come in waves, and – to this day – are not well understood.<sup>9</sup> Some of these ongoing long-haul patients seem to recover completely, but simply take more time to do so than the average fourteen-day recovery period. On the other hand, some patients still struggle a long time after their initial infection – potentially due to an immune system reaction and an overactivation of the body’s unspecific immune system and/or an awakening of an autoimmune disease or other previous infections (causing complications such as shingles).<sup>10</sup> With this broad-based and long-term impact on the status of health of society in mind as a driver of societal well-being and productivity, and with no direct cure against the long-term implications of COVID-19 at hand yet, we can say that COVID-19 will be the most impactful external shock triggering lasting change in our lifetimes.<sup>11</sup>

From the history of humankind and the knowledge about previous diseases, we can draw the inference that crises have always been turning points and ultimate spring feathers of lasting societal development.<sup>12</sup> This Article argues that

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19, 2021, at 99-104; *see also* Rita Rubin, *As Their Numbers Grow, COVID-19 “Long Haulers” Stump Experts*, 14 J. AM. MED. ASS’N 1381 (2020); Jeffrey D. Sachs et al., *Commentary, The Lancet COVID-19 Commission*, 396 THE LANCET 454, 455 (2020).

9. Robert Hart, *Long Covid Has Over 200 Symptoms and Leaves 1 in 5 Unable to Work, Study Finds*, FORBES (July 15, 2021, 9:39 AM), <https://www.forbes.com/sites/roberthart/2021/07/15/long-covid-has-over-200-symptoms-and-leaves-1-in-5-unable-to-work-study-finds/?sh=7f71338e5eb2> [<https://perma.cc/FF56-L8JC>]; Linda Searing, *50 Percent of People Who Survive Covid-19 Face Lingering Symptoms, Study Finds*, WASH. POST (Nov. 15, 2021, 8:00 AM), [https://www.washingtonpost.com/health/long-covid-50-percent-lingering-symptoms/2021/11/12/e6655236-4313-11ec-9ea7-3eb2406a2e24\\_story.html](https://www.washingtonpost.com/health/long-covid-50-percent-lingering-symptoms/2021/11/12/e6655236-4313-11ec-9ea7-3eb2406a2e24_story.html) [<https://perma.cc/G9QJ-UPHK>].

10. Drbeen Medical Lectures, *Spike Proteins in Immune Cells: Dr. Bruce Patterson Discusses COVID Long Haul*, YOUTUBE (June 24, 2021), <https://www.youtube.com/watch?v=JwjJs5ZHKJI> [<https://perma.cc/NQZ9-E362>]; *see also* Célia Márcia Fernandes Maia et al., *Increased Number of Herpes Zoster Cases in Brazil Related to the COVID-19 Pandemic*, 104 INT’L J. INFECTIOUS DISEASES 732.

11. Justine Coleman, *CDC Study on COVID-19 Long-Haulers: Two-Thirds of Non-Hospitalized Patients Receive New Diagnoses*, HILL (Apr. 23, 2021, 12:07 PM), <https://thehill.com/policy/healthcare/549950-cdc-study-on-covid-19-long-haulers-two-thirds-of-non-hospitalized-patients> [<https://perma.cc/3L3X-EEB6>]; *Changing Places*, ECONOMIST (Oct. 8, 2020), <https://www.economist.com/special-report/2020/10/08/changing-places> [<https://perma.cc/6TED-Y3LA>]; *Post-Covid Syndrome: Researchers Are Closing in on Long Covid*, ECONOMIST (Apr. 29, 2021), <https://www.economist.com/science-and-technology/2021/04/29/researchers-are-closing-in-on-long-covid> [<https://perma.cc/BV3J-83VK>].

12. *See* Paul Schmelzing, *Staff Working Paper No. 845: Eight Centuries of Global Real Interest Rates, R-G, and the ‘Suprasecular’ Decline, 1311-2018*, BANK ENG. 1 (2020); *Interdisciplinary, Multimedia Conference on July 14th and 15th, 2020*, ECOWELLNESS,

COVID-19 has the potential to dominate future individual, political, and corporate decisions directly or indirectly, but certainly profoundly. The large-scale dimension of COVID-19 infections around the world is underscored by an estimated 10-50% of those previously infected with COVID-19 facing some kind of longer-term or long-term health impact and/or chronic debilitation that is currently not well-understood by the medical profession.<sup>13</sup> Given the worldwide spread of the virus and that the demographic likelihood to become a COVID Long Hauler peaks in the 30-50 years of age bracket, we can predict a large-scale, long-term and global impetus of COVID long-haul induced change.

This Article argues that the phenomenon of long-haul COVID has the potential to transform our world and modern society. With attention to other historical examples – such as the post-World War II era – we speculate about three potential major developments. The presence of a generation of COVID Long Haulers has the potential to change the law, economics, and governance through the following predictive and debatable trends:

(1) In the overall economy, the COVID-19 crisis with lockdowns and urgent healthcare needs has produced a major consumption shift that has produced winning and losing industries. The finance world has largely been able to avoid harm by diversifying and flexibly replacing winning for losing industries in well-managed portfolios, as well as by shorting and hedging of sectors with a prospective loss during the crisis. At the same time, the real economy has often been hit by bankruptcy and liquidity constraints that played out in harmful choices and negative socio-psychological fallouts. All of this has widened an exacerbating finance performance versus real economy gap. Corporate and political power dynamics may shift in light of Long Haulers' relation to work and their appreciation of a healthy environment to be productive. Employers will likely face pressure to create a safe and secure working environment. Employers may also have rising tort liability risks that may be mitigated by hiring health consultants. Pro-active care for maintaining a healthy workforce and the overall long-term well-being of employees, including preventive care in teams, will become an essential corporate feature to attract qualified labor, whose bargaining power increases in the eye of labor shortages in human-facing industries and positions.<sup>14</sup>

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<https://www.oekowellness.de/laenderuebergreifende-konzerenz-zum-thema-system-change-die-chance-der-transformation-des-gesundheitswesens-14-07-2020/> [<https://perma.cc/CU74-RJ5D>] (last visited Aug. 12, 2020).

13. Hart, *supra* note 9; Searing, *supra* note 9.

14. Teresa Ghilarducci, *Are Firms Causing People to Quit? Quits Rate Increasing to 2.7%*, FORBES (Aug. 14, 2021, 11:32 AM), <https://www.forbes.com/sites/teresaghilarducci/2021/08/14/are-firms-causing-people-to-quit-quits-rate-increasing-to-27/?sh=3a18e42d35d0> [<https://perma.cc/LY22-8WC3>]; Robbie Whelan, *High Pay for Covid-19 Nurses Leads to Shortages at Some Hospitals*, WALL ST. J. (Aug. 29, 2021, 12:11 PM), <https://www.wsj.com/articles/high-pay-for-covid-19-nurses-leads-to-shortages-at-some-hospitals-11630253483> [<https://perma.cc/RN8C-AM2V>]; Bertrand Benoit & Tom Fairless, *Germany Boosts Already Hefty Coronavirus Stimulus*, WALL ST. J. (Aug. 26, 2020, 7:09 AM), <https://www.wsj.com/articles/germany-boosts-already->

Historically, ancient epidemics were turning points that eventually fostered innovation and mechanization in view of human labor shortage and a reduction of productive capacity. Generation COVID-19 Long-Haul will likely turn to digitalization and may erode resistance against artificial intelligence taking over tasks previously performed by humans.

(2) Artificial intelligence, robotics, and big data offer essential complements and insights to substitute for long-haul attention and productivity deficits that may occur in waves. COVID-19 Long Haulers may embark on an artificial intelligence revolution triggered by medical self-monitoring, constant health status tracking, and real-time scanning of their environment for harmful aerosols with IT solutions. The social media instant information exchange may also lead to a democratization of healthcare information without medical professionals as gatekeepers. Long COVID patients are a self-identified disease group as Long Haulers have already found themselves in online self-help groups – such as Survivor Corps – for quick and unbureaucratic information exchange about an emerging group phenomenon. Social online media platforms served as easy remedies during a time when a surge of severe COVID cases precluded COVID hospitalization.

The congested situation in intensive care units around the world has driven a trend of COVID long-haul patients becoming citizen scientists who bundle decentralized information on their health status and potential remedies in online social media forums in order to inform the medical profession about newly emerging trends. The rise in medical self-help and mutual support will have profound implications for the regulation of the medical profession and will likely boost alternative medicine and over-the-counter drugs. Implicit monopolization of pharmaceutical markets and biased subscription favoritism may become harder when access to healthcare information and medication remedy but also side effects become more transparent in the digital age. At the same time, however, in the instant online exchange of sensitive information about one's health status, citizen scientists are particularly vulnerable in terms of their privacy and potentially susceptible to online marketing campaigns under medically impaired conditions. The legal profession at the forefront, but also regulatory agencies overseeing the market and society at large will have to find solutions to protect Long Haulers in their public disclosure of sensitive information online over time.

(3) With reference to historical precedents of the past, Generation COVID Long-Haul partially being recognized as a disability may result in increased pressures to reform social, healthcare and retirement systems on a large scale. Especially when considering the relatively young age of COVID-19 long-hauling onsets, which is currently estimated to peak around the ages of 30 to 50, the long-term impetus of this usually highly productive part of society being slowed and/or weakened will be substantial when considering the expected decline in tax revenue from this age group's working income.

Given that around 70 to 75% of Long Haulers are currently estimated to be female, but also taking into account that about one third of all Long Haulers'

symptoms come in waves during debilitating COVID long-haul episodes, the future analysis of macroeconomic aggregates and policy impacts is likely to reflect a more diversified gender-sensitive and temporal view of social preferences under unpredictably changing conditions.<sup>15</sup> Future economic policy research may be inspired by the legal concept of disparate impact, which could help elucidate the aggregate production function calculus as the standard measure of economic growth. It could also inform a more diversified and individual intertemporal discounting function. Behavioral insights on navigating a turbulent world with attention deficits and under uncertainty about health status conditions may become fundamental for developing an idea of the economic benefits of rest by incorporating preferences for minimalism in a complex world longing for recovery.

Speculating about these potential future trends lies at the core of navigating through a turbulent time with vigilance. After all, history offers a vital account of multiple records when crises, upheaval and periods of severe social and economic disruptions and their following recovery periods became essential turning points for lasting societal change and spring feathers of eventual betterment. Overall, these consequences allow us to draw larger lessons for law, governance, and economic analysis. In the future, we may see a reconfiguring of institutions in many jurisdictions and a different understanding of health and well-being contributing to a more behaviorally informed economic profession.

Social and economic phenomena, such as corporate governance, are sometimes analogized to biological evolution.<sup>16</sup> As the shock of the pandemic had an immediate effect on all countries around the world, COVID-19 long-haul is likely to change the larger economic environment and societal structure of modern democracies for years to come. We can expect COVID-19 and a growing pandemic of long-term debilitated to cause substantial changes in corporate governance and related fields that will have a lasting impact for our future to come. Thus, as long-haul symptoms persist, we are likely to see direct and indirect persistent effects in the future. Taking this net of diverse effects together, the Article ends with public policy recommendations and guidance for implementation paying attention to contemporary and anticipated long-haul patterns and trends. In the wake of ambitious bailout and recovery plans, a law and economics view could highlight necessary disparate impact facets of economic fallouts to a common crisis that should be considered when choosing capital transfer targets strategically and driven by fairness mandates and with a

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15. Rubin, *supra* note 8.

16. See Martin Gelter & Julia M. Puauschunder, *COVID-19 and Comparative Corporate Governance*, 46 J. CORP. L. 557 (2021); Amitai Aviram, *Evolutionary Models of Corporate Law*, RSCH. HANDBOOK ON HIST. CORP. & CO. L. 596, 602-606 (2017); M.B.W. Sinclair, *The Use of Evolution Theory in Law*, 64 U. DET. L. REV. 451, 451-52 (1987) (noting legal evolution is necessarily Lamarckian); Simon Deakin, *Evolution for Our Time: A Theory of Legal Memetics*, 55 CURRENT LEGAL PROBS. 1 (2002); Simon Deakin & Fabio Carvalho, *System and Evolution in Corporate Governance*, EUR. CORP. GOVERNANCE INST. 111 (2010); Mark J. Roe, Commentary, *Chaos and Evolution in Law and Economics*, 109 HARV. L. REV. 641, 664 (1996).

long-term view in mind to breed harmony within society and between generations.<sup>17</sup> As for scientific advancements, Generation COVID Long-Haul has the potential to imbue minimalism, rest, and recovery as central axioms around which economic calculus is newly focused.

All measures laid out<sup>18</sup> point toward fundamental societal changes.<sup>19</sup> Governments around the globe have therefore set out on a course to avert the negative impetus of the COVID-19 pandemic economic shock.<sup>20</sup> This Article aims to address these major trends and developments that are unique features of the COVID-19 crisis to highlight their relevance in determining future-oriented policies and multifaceted recovery aid.<sup>21</sup>

Overall, we argue that the COVID-19 pandemic, as the most massive exogenous shock and subsequent policy changes in relation to a drastic long-term health status shift of major parts of the productive workforce and society, has the potential to change many aspects of the individual consumer, the family compound, societal care systems, and economic incentives for market actors and industries. Paying attention to anticipated disruption fallouts will aid governments around the world in confronting the crisis but also to reinterpret the way we produce, consume and – most importantly – live our lives productively, healthily, and within a fair society that acts in harmony with the environment. By learning from our history, and in particular from the resilience exposed to previous crises, we will hopefully emerge from COVID-19 stronger as a society in the long term and with gifts of better lives for future generations to come.<sup>22</sup>

This Article proceeds as follows. Part 2 describes the impact of the external shock of COVID-19 on humankind with particular attention to the COVID long-haul phenomenon. Part 3 explores three long-haul trends. First, section 3.1 discusses governance and political economy power dynamic shifts in view of Long Haulers' relation to work, paying attention to an unprecedented demand for a healthy productive workplace environment. Next, section 3.2 highlights the potential of artificial intelligence, robotics, and big data to fill in for long-haul

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17. Julia Margarete Puaschunder, *Focusing COVID-19 Bailout and Recovery*, OHIO STATE BUS. L.J. (forthcoming).

18. See *A Crisis Like No Other, An Uncertain Recovery*, INT'L MONETARY FUND 1 (2020); Lawrence O Gostin et al., Comment, *A Global Health Action Agenda for the Biden Administration*, 397 LANCET 5, 6 (2021) (“COVID-19 has unleashed vast economic, social, and health crises.”).

19. See Julia M. Puaschunder & Dirk Beerbaum, *Healthcare Inequality in the Digital 21st Century: The Case for a Mandate for Equal Access to Quality Medicine for All* (Sept. 28, 2020) (unpublished manuscript) (on file with author).

20. See, e.g., Ziyad Cassim et al., *The \$10 Trillion Rescue: How Governments Can Deliver Impact*, MCKINSEY & CO. 1 (2020); Press Release, President Joe Biden, President Biden Announces American Rescue Plan (Jan. 20, 2021), <https://www.whitehouse.gov/briefing-room/legislation/2021/01/20/president-biden-announces-american-rescue-plan/> [<https://perma.cc/W6NC-FALP>].

21. Princeton Bendheim Center for Finance, *A Conversation with Lawrence H. Summers and Paul Krugman*, YOUTUBE (Feb. 12, 2021), [https://www.youtube.com/watch?v=EbZ3\\_LZxs54](https://www.youtube.com/watch?v=EbZ3_LZxs54) [<https://perma.cc/7457-UDXV>].

22. See MARKUS BRUNNERMEIER, *THE RESILIENT SOCIETY* (2021).

attention and productivity gaps but also raises awareness for problems arising in the new emerging democratization of healthcare information online with particular focus on privacy and discrimination concerns of vulnerable populations sharing information openly online. Section 3.3 draws from historical examples of the past to outline crises as crucial turning points for system changes and argues that policymakers should pay particular attention to the disparate effect of COVID-19 long-haul tails in a world, in which minimalism, rest, and recovery have become essential for moving forward. Part 4 discusses science and policy implications before the Article ends in Part 5 with a conclusion.

## II. COVID-19 AND ITS LONG-TERM IMPACT

### A. COVID-19

The new Coronavirus (also referred to as “SARS-CoV-2,” or “COVID-19”) is an infectious disease that was first diagnosed in Wuhan, China, in December 2019.<sup>23</sup> First in January of 2020, international entities, foremost the World Health Organization, were alarming about COVID-19 and subsequently declared the state of emergency with international relevance. By March 2020, COVID-19 was recognized as the outbreak of a global pandemic.<sup>24</sup> As of the end of 2021, over 250 million infected cases are known and over 5 million COVID-19 induced deaths have been recorded in over 220 countries and national entities in all World Health Organization territories.<sup>25</sup> Actual infection rates may be higher, adding from 5% to 30% more infected to the reported numbers.<sup>26</sup>

COVID-19 causes blood vessel changes that affect people in different ways, ranging from no symptoms to mild cases and severe illness and death. Symptoms may appear at different times, either immediately or – as most infected report – within several days. Incubation time intervals range from 2-14 days or 4-6 days depending on COVID-19 variants – but also some mild cases have been reported to cause health impairment a long time after the initial infection. Some cases of infection turn out to be relatively mild but tend to exhibit often seemingly unrelated symptoms appearing months after the initial infection. These so-called COVID-19 Long Hauler cases often show widespread and diffuse symptoms coming on and off in waves.

To this day, the United States Centers for Disease Control and Prevention (“CDC”) continues to update the list of COVID-19 induced symptoms and related

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23. *Timeline: WHO’s COVID-19 Response*, WORLD HEALTH ORG., <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline> [https://perma.cc/94W7-T34L] (last visited Dec. 28, 2021).

24. Rubin, *supra* note 8.

25. *Coronavirus Cases*, *supra* note 4.

26. *Severe Undercounting of COVID-19 Cases in U.S., Other Countries Estimated via Model*, SCIENCE DAILY (Feb. 8, 2021), <https://www.sciencedaily.com/releases/2021/02/210208142434.htm> [https://perma.cc/4HJV-P8UQ].

health complications as well as psychological impairments.<sup>27</sup> The most common signs of a COVID-19 infection are fever, dry cough, and tiredness. Other symptoms often noticed include shortness of breath or difficulty breathing, muscle aches, chills, sore throat, running nose, headaches, and chest pain. Additional COVID-19 impairments include loss of taste or smell, congestion, nausea, vomiting diarrhea, confusion, sleepiness, insomnia, skin, gum, and tongue outbreaks.<sup>28</sup> Depending on age and pre-existing conditions, COVID-19 can lead to acute complications such as organ failure, cytokine storms, blood clots, and septic shock.<sup>29</sup>

Of the over 250 million COVID-19 individuals reported to have been infected, 99.4% appeared to have had only mild conditions, and only 0.6% are/were considered seriously and/or critically ill.<sup>30</sup> Of the reported closed COVID-19 infection cases so far, in 2% the COVID-19 disease led to death, while 98% of the infected are considered to have recovered from acute symptoms.<sup>31</sup> Why any particular patient falls into either of these groups of immune responses to COVID-19 is yet unclear, but certain disease trajectory propensities seem to depend on gender, age and pre-existing conditions. Moreover, the viral load exposure to the virus and other infections influence the course of the disease alongside a range of genetic predispositions and environmental pre-COVID episodes.<sup>32</sup> The COVID-19 fatality rate varies between 2.8% for male and 1.7% for female patients.<sup>33</sup> As for the COVID-19 fatality rate by comorbidity, pre-existing conditions increase the death rate to 10.5% across cases of cardiovascular diseases, 7.3% for diabetes, 6.3% for chronic respiratory diseases, 6% for hypertension, and 5.6% for cancer.<sup>34</sup> Underlying conditions and pre-existing health impairments – such as, for instance, diabetes, lung disease, cancer, immunodeficiency, heart diseases, hypertension, asthma, kidney disease, and GI/liver diseases – appear to play a major role in determining the outcome likelihoods of a COVID-19 infection.<sup>35</sup> Nutrition and prevention influence the disease trajectory and sickness outcome, as do precautions and vigilance, such as being vaccinated against COVID-19, targeted medication, not getting exposed to a high viral load, and avoiding

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27. *Post-COVID Conditions: Information for Healthcare Providers*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-care/post-covid-conditions.html> [<https://perma.cc/UN27-MK93>] (last updated July 9, 2021).

28. *Symptoms of COVID-19*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html> [<https://perma.cc/Z5L8-VBED>] (last updated Feb. 22, 2021).

29. *Id.*

30. *Coronavirus Cases*, *supra* note 4.

31. *Id.*

32. See Abdul Mannan Baig, *Chronic COVID Syndrome: Need for an Appropriate Medical Terminology for Long-COVID and COVID Long-Haulers*, 93 J. MED. VIROLOGY 2555 (2021).

33. *Id.*

34. *Interdisciplinary, Multimedia Conference*, *supra* note 12.

35. *Coronavirus Cases*, *supra* note 4.

repetitive exposure to the virus. In addition, the multiple COVID variants existent by now impact the transmission likelihood and trajectory of the disease in symptoms and outcome differently.<sup>36</sup>

### *B. Potential Long-Haul Impact of COVID-19*

In about 10-50% of those symptomatically or asymptotically previously infected with SARS-CoV-2, impairment continues long after the infection – in some cases even after having been tested negative for COVID-19.<sup>37</sup> Long COVID, also known as post-COVID-19 syndrome, post-acute sequelae of COVID-19 (“PASC”), chronic COVID syndrome (CCS) and long-haul COVID is a persisting convalescence period after a coronavirus disease 2019 infection.<sup>38</sup>

Post-COVID conditions comprise a wide range of new, returning and/or ongoing health problems that individuals can experience four or more weeks after the first infection.<sup>39</sup> So-called COVID-19 Long Haulers face impairment lasting more than 4-12 weeks after exposure to the virus. The degree, duration and frequency of impairment varies – some face constant issues, while it is estimated that around one third of COVID Long Haulers face recurrent waves of symptoms after their initial infection.<sup>40</sup>

The range of long COVID symptoms is wide and diffuse. Survey data collected early on by a self-organized Facebook Long Hauler group called Survivor Corps consisting of 1567 respondents struggling with long-term COVID identified almost 100 long-haul effects that include fatigue (100% previously-COVID-infected survey takers reported it as a recurrent symptom), muscle or body aches (66.8%), shortness of breath or difficulty breathing (65.1%), difficulty concentrating or focusing (59%), inability to exercise or be active (58.5%), headache (57.6%), difficulty sleeping (49.9%), anxiety (47.6%), memory problems (45.6%) and dizziness (41.9%) among the top long-haul symptoms.<sup>41</sup> Follow-up studies revealed a cluster of symptoms ranging from chest pain and cough, dyspnea and cough, anxiety and tachycardia, abdominal pain and nausea as well as lower back pain or joint pain.<sup>42</sup> The list of symptoms is still being updated while the CDC issued guidelines call for empathy with Long Haulers.<sup>43</sup>

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36. *Id.*

37. Hart, *supra* note 9; Searing, *supra* note 9.

38. Baig, *supra* note 32; *Post-COVID Conditions*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects.html> [<https://perma.cc/53D8-3G5H>] (last visited Aug. 21, 2021).

39. *Id.*

40. Harrison, *supra* note 8.

41. Britt, *supra* note 8.

42. Aislinn Antrim, *Study: Many Long-Haul COVID-19 Patients Were Asymptomatic During Initial Infection*, PHARMACY TIMES (Mar. 12, 2021), <https://www.pharmacytimes.com/view/study-many-long-haul-covid-19-patients-were-asymptomatic-during-initial-infection> [<https://perma.cc/X7YC-T4RG>].

43. *Post-COVID Conditions: Information for Healthcare Providers*, *supra* note 27; *Post-*

Longer lasting COVID-19 symptoms appear to come in waves, can be wide-ranging, and include – by now – over 200 different symptoms, such as cognitive dysfunction, numbness or tingling, loss of taste, smell and other senses like hearing and vision, muscle pain, tinnitus, heart rate and blood pressure issues, inflammation, joint pain, gastrointestinal discomfort, insomnia, depression and anxiety but also dermatological anomalies mainly in the gum, hands, fingers, feet and toes.<sup>44</sup> From the physical but also the psychological standpoint, COVID long-haul impairment is reported to be particularly challenging.<sup>45</sup>

The etiology of COVID-19 Long Haulers currently appears to fall in three major – partially overlapping – groups of health problem clusters: (1) those with strong infection cases and long-term organ or tissue damage, (2) those with initially mild cases that develop waves of obscure symptoms that either resemble inflammatory and/or autoimmune diseases, and/or (3) neurological impairments that bleed into a traumatized psychological state.<sup>46</sup>

Recovery remains unclear but for irreversible damage, such as scars on lungs, and damage to the heart tissue, transplantations appear the most promising long-run remedy. As for remainders of the virus and the immune system still working on clearing all body parts of the previous virus invasion, symptoms will likely be curable over time and may come and go, such as in herpes, shingles, Ebola, or malaria. Recurrent waves of weakness may persist for a long period of time for this cluster of COVID Long Haulers but appear to have an overall upwards trajectory of recovery.<sup>47</sup> For patients with overshooting immune activation, like Lyme disease or virologically-triggered rheumatoid arthritis, immunosuppressants may aid but may create long-term disabling conditions if considering the relatively young age of COVID long-haul onset.

The demographic impact of long-haul COVID appears to fall disproportionately heavily on 30-50 years young females with a mean age of around 42 years at the time of their initial infection.<sup>48</sup> The average COVID Long Haulers are in their late thirties and early forties, with females making up an

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*COVID Conditions*, *supra* note 38.

44. Alicia Ault, *Are There COVID-19-Related 'Long-Haul' Skin Issues?*, *DERMATOLOGYNEWS* (Jan. 28, 2021), <https://www.mdedge.com/dermatology/article/235153/coronavirus-updates/are-there-covid-19-related-long-haul-skin-issues> [<https://perma.cc/52EQ-ZUUM>]; Kathleen Doheny, *Neurological Symptoms Frequent in COVID Long-Haulers*, *WEBMD* (Mar. 23, 2021), <https://www.webmd.com/lung/news/20210323/neurologic-symptoms-frequent-covid-long-haul-partients> [<https://perma.cc/G9ER-WSSH>].

45. Damian McNamara, *'Long Haul' COVID Recovery Worse Than Cancer Rehab for Some*, *WEBMD* (July 12, 2021), <https://www.webmd.com/lung/news/20210712/long-haul-covid-recovery> [<https://perma.cc/W5G3-EZZD>].

46. Julia M. Puauschunder, *Generation Post-COVID-19: The Time for Anti-Economics Has Come: Health, Minimalism and Rest*, *SCIENTIA MORALITAS CONF. PROC.* 1, 5 (2021).

47. See Hannah E. Davis et al., *Characterizing Long COVID in an International Cohort: 7 Months of Symptoms and Their Impact*, 38 *ECLINICALMEDICINE* 1 (2021).

48. Rubin, *supra* note 8.

estimated 70-75%.<sup>49</sup> Most recently, emerging studies report that multi-organ functioning debilitation after COVID-19 can also be prevalent in children and young, previously fully healthy and active adults.<sup>50</sup> Most recent preliminary research findings suggest that at least in some COVID Long Haulers the immune system appears to develop macrophages with protein debris that – a while after the initial infection – start causing harm to the immune system by creating inflammation in different parts of the body that creates or further exacerbates chronic debilitation.<sup>51</sup> Ongoing research attributes an overshooting autoimmune response and/or early onset of a genetically-predisposed autoimmune disease as causing the disabled state of COVID-19 Long Haulers.<sup>52</sup>

### *C. Generation COVID-19 Long-Haul*

A recent study of 6,500 COVID Long Haulers estimated that 10-30% of all infected individuals have the potential to become Long Haulers suffering from lasting effects of a previous COVID infection and continuous disability and/or waves of recurrent symptoms,<sup>53</sup> which include fatigue, headaches and breathing problems as well as a set of debilitating memory fog and emotional distress.<sup>54</sup> Research estimates that from about 10% upwards to up to 50% of those exposed to COVID-19 patients will become Long Haulers, and that 80% of the world population will be infected with COVID at a certain point in their lives.<sup>55</sup> Consequently, the world faces a potential Long Hauler population ranging from over 600 million to more than three billion Long Haulers worldwide in the decades to come.

By February 2021 the COVID-19 pandemic had caused an estimated loss of over 20.5 million human life years globally.<sup>56</sup> By November 2021 the estimated

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49. *Id.*

50. *Harrison, supra* note 8.

51. *Drbeen Medical Lectures, supra* note 10.

52. *Id.*; *Yale Study Connects Long COVID with Autoantibodies*, YALE SCH. MED. (Jan 5, 2021), <https://medicine.yale.edu/media-player/yale-study-connects-long-covid-with-autoantibodies/> [<https://perma.cc/HGF3-KKPU>]; *see also* Eric Y. Wang et al., *Diverse Functional Autoantibodies in Patients with COVID-19*, 595 NATURE 283 (2021).

53. *Hart, supra* note 9.

54. *Rubin, supra* note 8; Press Release, President Joe Biden, Fact Sheet: Biden-Harris Administration Marks Anniversary of Americans with Disabilities Act and Announces Resources to Support Individuals with Long COVID (July 26, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/26/fact-sheet-biden-harris-administration-marks-anniversary-of-americans-with-disabilities-act-and-announces-resources-to-support-individuals-with-long-covid/> [<https://perma.cc/J7Q2-U9Q5>]; Chelsea Cirruzzo, *Long COVID Can Be a Disability*, *White House Says*, U.S. NEWS (July 26, 2021), <https://www.usnews.com/news/health-news/articles/2021-07-26/long-covid-can-be-a-disability-biden-administration-says>.

55. *Hart, supra* note 9; *Searing, supra* note 9.

56. *See* Héctor Pifarré i Arolas et al., *Years of Life Lost to COVID-19 in 81 Countries*, 11 NATURE SCI. REP. 3504 (2021).

lost years of life around the globe had risen to 28 million.<sup>57</sup> With the potential for a growing body of long-term debilitation in COVID-19, and with the lack of a complete cure and/or protection against COVID-19 so far, but also the sobering recognition that only a bit over 50% of the world population has been vaccinated against the Coronavirus and only 5% in low-income countries and breakthrough cases or cases of Long Haulers are reported despite being vaccinated leads to the projection that the Coronavirus 2019 crisis will have a lasting socio-economic impact on contemporary humankind and generations to come.<sup>58</sup>

#### *D. Generation COVID-19 Great Reset Opportunity*

COVID-19 accounts for the most unpredicted and widespread external shock for modern humankind. Drastic downturns for trade, human mobility and international service industries demanded unprecedented governmental intervention.<sup>59</sup> Overall, the COVID-19 global recession is estimated to be the deepest since World War II, with the largest fraction of economies experiencing declines in per capita output since 1870.<sup>60</sup> The economic external shock seems to have ended globalization and international exchange if considering the World Bank expecting the sharpest decline in remittances in recent history.<sup>61</sup> While the

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57. Andrew Jeong, *Covid Study Finds Some 28 Million Extra Years of Life Lost in 2020, with U.S. Male Life Expectancy Badly Hit*, WASH. POST (Nov. 4, 2021, 2:11 AM), <https://www.washingtonpost.com/health/2021/11/04/coronavirus-pandemic-global-years-lost-life/> [<https://perma.cc/5DKQ-FK6S>]; see also Nazrul Islam et al., *Effects of Covid-19 Pandemic on Life Expectancy and Premature Mortality in 2020: Time Series Analysis in 37 Countries*, 375 BRIT. MED. J. 1 (2021).

58. *UN Response to COVID-19*, UNITED NATIONS, <https://www.un.org/en/coronavirus/UN-response> [<https://perma.cc/X3T8-BKJ2>] (last visited Aug. 29, 2021); *Coronavirus (COVID-19) Vaccinations*, OUR WORLD DATA, <https://ourworldindata.org/covid-vaccinations> [<https://perma.cc/G78L-HJK5>] (last visited Aug. 29, 2021).

59. Julia M. Puauschunder et al., *COVID-19 Shock: Considerations on Socio-Technological, Legal, Corporate, Economic and Governance Changes and Trends*, PROC. 16TH INT'L RSCH. ASS'N FOR INTERDISC. STUD. CONF. ON SOC. SCI. & HUMAN. 82, 86 (2020); see generally Stefan Gössling et al., *Pandemics, Tourism and Global Change: A Rapid Assessment of COVID-19*, 29 J. SUSTAINABLE TOURISM 1, 2 (2020); Sachs et al., *supra* note 8; see also *How COVID-19 is Changing the World: A Statistical Perspective*, COMM. FOR COORDINATION STAT. ACTIVITIES 1, 14-31 (2020) (demonstrating the economic decline in various industries); *Global Economic Prospects: Global Outlook*, WORLD BANK GRP. 3 (2021). The International Monetary Fund ("IMF") estimated a drastic drop in global gross domestic production from -3% in April, 2020, to -4.9% by June 2020. *A Crisis Like No Other, An Uncertain Recovery*, *supra* note 18.

60. M. Ayhan Kose & Naotaka Sugawara, *Understanding the Depth of the 2020 Global Recession in 5 Charts*, WORLD BANK (June 15, 2020), <https://blogs.worldbank.org/opendata/understanding-depth-2020-global-recession-5-charts> [<https://perma.cc/N8LG-5LE4>].

61. Press Release, World Bank, *World Bank Predicts Sharpest Decline of Remittances in Recent History* (Apr. 22, 2020), <https://www.worldbank.org/en/news/press-release/2020/04/22/world-bank-predicts-sharpest-decline-of-remittances-in-recent-history> [<https://perma.cc/43M8->

recession did not last as long as originally expected and reverted to growth in 2021, it is still likely to have a persistent worldwide impact when considering the substantial quantitative easing and monetary control the saving of the global world economy has taken.<sup>62</sup> The unprecedented size, scope and dimensions of COVID-19 rescue and recovery plans have also sparked discourse about the potential negative consequences of inflation and urge to reflect on the disparate negative impacts on marginalized groups. The economic fallout<sup>63</sup> is expected to bring about lasting fundamental changes for society.<sup>64</sup>

Yet the crisis also holds enormous potential as governments around the globe have embarked on a course to avert the negative impetus of the COVID-19 pandemic economic shock. These measures resulted in long-term international, governance and governmental changes funded by unprecedentedly large rescue packages and recovery aid.<sup>65</sup> The short-term impact of COVID-19 has triggered massive financial flows of economic rescue and governance recovery aid around the world already. Coupled with behavioral changes and abrupt shifts in consumption patterns in addition to governmental legal and governance regulatory innovations, one starts imagining the once-in-a-lifetime potential of COVID-19 for a lasting “reset” of the world.<sup>66</sup>

In the international arena, central banks of all major world economies and the European Central Bank coordinated to lower the price of USD liquidity swap line arrangements in order to foster the provision of global liquidity.<sup>67</sup> The International Monetary Fund (“IMF”) and the World Bank<sup>68</sup> issued economic

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62. *Business Cycle Dating Committee Announcement July 19, 2021*, NAT’L BUREAU ECON. RSCH. (July 19, 2021), <https://www.nber.org/news/business-cycle-dating-committee-announcement-july-19-2021> [<https://perma.cc/XL44-4TEP>] (finding the recession in the U.S. lasted only from February through April 2021); James K. Jackson, et al., *Global Economic Effects of COVID-19*, CONG. RSCH. SERV. 1, 30-31 (2021) (reviewing projections for growth in the major economies in 2021).

63. *A Crisis Like No Other, An Uncertain Recovery*, *supra* note 18.

64. Puaschunder & Beerbaum, *supra* note 19.

65. Cassim et al., *supra* note 20; Press Release, President Joe Biden, *supra* note 20.

66. Adrian Monck, *The Great Reset: A Unique Twin Summit to Begin 2021*, WORLD ECON. F. (June 3, 2020), <https://www.weforum.org/press/2020/06/the-great-reset-a-unique-twin-summit-to-begin-2021> [<https://perma.cc/FB8K-L7DT>].

67. Gabe Alpert, *International COVID-19 Stimulus and Relief*, INVESTOPEDIA, <https://www.investopedia.com/government-stimulus-and-relief-efforts-to-fight-the-covid-19-crisis-5113980> [<https://perma.cc/JK5Z-FV8N>] (last updated Sept. 7, 2021); Press Release, Eur. Cent. Bank, Coordinated Central Bank Action to Enhance the Provision of Global US Dollar Liquidity (Mar. 15, 2020), [https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200315~1fab6a9f1f\\_sv.html](https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200315~1fab6a9f1f_sv.html) [<https://perma.cc/L4KL-VV4C>]; Press Release, Bd. Governors Fed. Rsrv. Sys., Federal Reserve Announces the Establishment of Temporary U.S. Dollar Liquidity Arrangements with Other Central Banks (Mar. 19, 2020), <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200319b.htm> [<https://perma.cc/MSK9-LDXR>].

68. Alpert, *supra* note 67; *The IMF’s Response to COVID-19*, INT’L MONETARY FUND,

stimulus and relief efforts in the range of around 260 billion U.S. dollars, with the majority of relief aid being distributed in the developing world.<sup>69</sup>

As of May 2021, all major economies responded to the economic fallout of COVID-19 in financial terms. In light of the ongoing COVID-19 crisis, governments around the world have rolled out economic assistance packages or recovery releases that by mid-2020 already amount to a total of over ten trillion U.S. dollars.<sup>70</sup> Given the long-term impetus and the recurrent waves of COVID outbreaks still ongoing, there is a continuous prospect of renewal and further expansion of economic rescue and recovery aid.

Across countries, economic stimulus responses to the COVID-19 crisis vastly outsize those to the 2008 financial crisis.<sup>71</sup> The qualitative and quantitative stimulus, rescue and recovery aid packages have surpassed all other programs of this type in human history.<sup>72</sup> The cost of saving the global economy is estimated to have been 834 million U.S. dollars per hour for eighteen months, including almost four trillion rescue funds spent by the United States Federal Reserve alone.<sup>73</sup>

Economic COVID-19 stimulus and relief efforts mainly comprise international fiscal and monetary stimulus and relief efforts but also direct rescue bailout packages. These are often coupled with publicly administered healthcare and labor regulations, such as *Kurzarbeit* schemes limiting the number of work hours per worker in order to keep workers employed.<sup>74</sup>

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<https://www.imf.org/en/About/FAQ/imf-response-to-covid-19> (last visited May 13, 2020); Press Release, World Bank, World Bank Group Announces Up to \$12 Billion Immediate Support for COVID-19 Country Response (Mar. 3, 2020), <https://www.worldbank.org/en/news/press-release/2020/03/03/world-bank-group-announces-up-to-12-billion-immediate-support-for-covid-19-country-response#:~:text=WASHINGTON%2C%20March%203%2C%202020%20%E2%80%94,impacts%20of%20the%20global%20outbreak> [<https://perma.cc/2DPH-ER7W>]; Press Release, World Bank, World Bank Group Increases COVID-19 Response to \$14 Billion to Help Sustain Economies, Protect Jobs (Mar. 17, 2020), <https://www.worldbank.org/en/news/press-release/2020/03/17/world-bank-group-increases-covid-19-response-to-14-billion-to-help-sustain-economies-protect-jobs> [<https://perma.cc/GQW7-2U3D>].

69. Alpert, *supra* note 67; Press Release, World Bank, World Bank Group: 100 Countries Get Support in Response to COVID-19 (Coronavirus) (May 19, 2020), <https://www.worldbank.org/en/news/press-release/2020/05/19/world-bank-group-100-countries-get-support-in-response-to-covid-19-coronavirus> [<https://perma.cc/FG8J-MQ99>].

70. Cassim et al., *supra* note 20; Press Release, President Joe Biden, *supra* note 20.

71. *Id.*

72. Alpert, *supra* note 67.

73. Lynn Thomasson & James Hirai, *The Cost of Saving Global Economy: \$834 Million an Hour for 18 Months*, BUS. STANDARD (Aug. 21, 2021), [https://www.business-standard.com/article/international/the-cost-of-saving-global-economy-834-million-an-hour-for-18-months-121082100048\\_1.html](https://www.business-standard.com/article/international/the-cost-of-saving-global-economy-834-million-an-hour-for-18-months-121082100048_1.html) [<https://perma.cc/7W2A-MWGM>].

74. See Jackson et al., *supra* note 62, at 25-27; Lora Jones et al., *Coronavirus: How the Pandemic Has Changed the World Economy*, BBC NEWS (Jan. 24, 2021), <https://www.bbc.com/news/business-51706225> [<https://perma.cc/NQE3-6JDW>]; *The Peril and the Promise*, ECONOMIST

The size, scope and dimension of COVID-19 rescue and recovery plans account for the historically largest concerted action to avert the negative economic fallout to a worldwide external economic shock. In confronting the crisis and evaluating international and governmental rescue efforts, the size of rescue and recovery aid has gained widespread attention, foremost because of fear of inflationary pressure.<sup>75</sup> These unprecedentedly-large amounts of governmental stimulus, economic bailout and rescue funds hold opportunity to finance a great reset.<sup>76</sup> In strategically setting economic incentives and stimulating societal advancement in the post-COVID era, society is hoped to emerge stronger out of a crisis.<sup>77</sup>

The remainder of the Article will focus on three speculative trends in the wake of the COVID-19 crisis with particular attention to COVID Long Haulers and potential legal and public policy implications. The socio-economic trends of our currently forming Generation COVID-19 long-haul are discussed in the following sections to enhance society's potential for building resilience vigilantly.

### III. COVID-19 LONG-HAUL TRENDS

#### A. Governance and Political Economy of Deurbanization

The COVID-19 crisis is the most unexpected external shock of our times. Starting from the end of 2019, the novel coronavirus caused a dramatic downturn for consumption, trade, human mobility and international service industries.<sup>78</sup>

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(Oct. 8, 2020), <https://www.economist.com/special-report/2020/10/08/the-peril-and-the-promise> [<https://perma.cc/9GYG-3ZRJ>]; *The Pandemic Has Caused the World's Economies to Diverge*, ECONOMIST (Oct. 8, 2020), <https://www.economist.com/leaders/2020/10/08/the-pandemic-has-caused-the-worlds-economies-to-diverge> [<https://perma.cc/QN7Z-L3KV>]; *Economy*, EUROSTAT, <https://ec.europa.eu/eurostat/web/covid-19/economy> [<https://perma.cc/SDW7-KBTJ>] (last visited July 28, 2020); see also Ken Mayhew & Paul Anand, *COVID-19 and the UK Labour Market*, 36 OXFORD REV. ECON. POL'Y S215, S217-21 (2020) (surveying furlough schemes in the UK and Germany).

75. See BRUNNERMEIER, *supra* note 22. The quantitative dimensions and largesse of governmental financialization of aid has led to star economists Lawrence Summers and Paul Krugman arguing over the right size of the governmental intervention in economic stimulus. Summers points at the sheer amount of stimulus that could set off inflationary pressures – a concern shared by other economists, such as Olivier Blanchard, a macroeconomist expert on inflationary pressure. See, e.g., Olivier Blanchard, *In Defense of Concerns Over the \$1.9 Trillion Relief Plan*, PETERSON INST. FOR INT'L ECON. (Feb. 18, 2021, 10:15 AM), <https://www.piie.com/blogs/realtime-economic-issues-watch/defense-concerns-over-19-trillion-relief-plan> [<https://perma.cc/8DEG-J42U>] (defending concerns over the \$1.9 trillion relief plan).

76. See, e.g., *The Great Reset*, WORLD ECON. F. (Sept. 24, 2020), <https://www.weforum.org/great-reset/> [<https://perma.cc/7MHH-DAS7>].

77. BRUNNERMEIER, *supra* note 22.

78. Puschunder et al., *supra* note 59, at 86; see generally Gössling et al., *supra* note 59, at 2; Catherine Tymkiw, *How COVID-19 Changed Our Saving and Spending Habits*, INVESTOPEDIA,

From April 2020, more than half of the world's population faced some sort of lockdown and/or consumption constraints and economic shortages, which disrupted economic productivity substantially.<sup>79</sup> Constraints on human social interaction in all major world economies coupled with a halt of human transport and trade shortages around the globe spilled over into an unprecedented international economic decline.<sup>80</sup> The lockdowns led to a slump in general consumption and reduced trade by an estimated 10%.<sup>81</sup> During the first two quarters of 2020, global FDIs plummeted by 49%, and were even suppressed by around 75% in the developed world.<sup>82</sup> The global economy declined by around 3-5% of the general world economic output in 2020, six times the economic magnitude of the 2008-09 world recession.<sup>83</sup> The IMF estimates that the world economy, as measured by real Gross Domestic Product ("GDP"), shrank by as much as 3.5% in 2020.<sup>84</sup> Rising poverty levels put an additional 150 million children at risk worldwide.<sup>85</sup>

The COVID-19 global recession is believed to be the deepest since World War II, with the largest fraction of economies experiencing declines in per capita output since 1870.<sup>86</sup> The economic external shock seems to end globalization and to severely limit international exchange when considering that the World Bank is expecting the sharpest decline in remittances in recent history.<sup>87</sup> The external shock to the world economy, international relations and our all daily lives accounts for the most disruptive lifestyle change factor of modernity.<sup>88</sup> Never before in the history of economics has the entire world economy contracted by 20% in a matter of weeks and 95% of the world's economies were suffering.<sup>89</sup> Across the world hundreds of millions lost their employment.<sup>90</sup> Long after the

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<https://www.investopedia.com/how-covid-19-changed-our-saving-and-spending-habits-5184327> [<https://perma.cc/3T5D-6MPS>] (last updated Sept. 28, 2021).

79. *Policy Responses to COVID-19*, INT'L MONETARY FUND, <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19> (last updated July 2, 2021).

80. See, e.g., Sachs et al., *supra* note 8, at 455; see also *How COVID-19 Is Changing the World*, *supra* note 59, at 14-31.

81. *Changing Places*, *supra* note 11.

82. *Investment Trends Monitor*, UNITED NATIONS CONF. ON TRADE & DEV. 1, 1 (2020).

83. *Global Economic Prospects*, *supra* note 59, at 3. The International Monetary Fund (IMF) outlined a decline in global gross domestic product of -4.9% in June 2020. *The IMF's Response to COVID-19*, *supra* note 68.

84. Alpert, *supra* note 67.

85. Press Release, United Nations Child. Fund, 150 Million Additional Children Plunged into Poverty Due to COVID-19, UNICEF, Save the Children Say (Sept. 16, 2020), <https://www.unicef.org/press-releases/150-million-additional-children-plunged-poverty-due-covid-19-unicef-save-children> [<https://perma.cc/72QS-QD8F>].

86. Kose & Sugawara, *supra* note 60.

87. *Global Economic Prospects*, *supra* note 59.

88. See ADAM TOOZE, SHUTDOWN: HOW COVID SHOOK THE WORLD'S ECONOMY (2021).

89. *Id.*

90. *Id.*

onset of crises, the world faces the threat of a majority of the population requiring long-term health, well-being and economic recovery aid.<sup>91</sup> All these measures resemble the onset of a lasting economic crisis<sup>92</sup> that precipitates fundamental changes in society.<sup>93</sup> Governments around the globe have set out on a course to avert the negative impetus of the COVID-19 pandemic economic shock.<sup>94</sup>

### 1. *Rising Inequality*

The Union Bank of Switzerland (“UBS”) addresses the COVID-19 pandemic shock as the biggest economic disparity between modern world economies in at least forty years opened up in the aftermath of the COVID outbreak.<sup>95</sup> COVID-19 creates new but also exacerbates already existing inequality.<sup>96</sup> The pandemic heightened economic disparity between countries, sectors, and societal groups. Existing inequalities became more accentuated in regards to healthcare and well-being but also digitalization productivity.<sup>97</sup>

COVID-19 created enormous health and security threats but also economic costs. At the same time, every situation brings market opportunities.<sup>98</sup> Industries such as hygiene, medical care, pharmaceutical and medical supply providers, and nutrition and chronic disease specialists actually profited from COVID-19 and its long-term impetus.<sup>99</sup> In that sense, the COVID-19 external shock is

91. *Id.*

92. *A Crisis Like No Other, An Uncertain Recovery*, *supra* note 18.

93. Puaschunder & Beerbaum, *supra* note 19.

94. Cassim et al., *supra* note 20; Press Release, President Joe Biden, *supra* note 20.

95. *Changing Places*, *supra* note 11; *The Pandemic Has Caused the World's Economies to Diverge*, *supra* note 74; *The Peril and the Promise*, *supra* note 74.

96. Puaschunder et al., *supra* note 59; Gössling et al., *supra* note 59, at 1.

97. Puaschunder & Beerbaum, *supra* note 19.

98. See Julia M. Puaschunder et al., *Alleviating an Unequal COVID-19 World: Globally Digital and Productively Healthy*, PROC. UNEQUAL WORLD CONF.: ON HUM. DEV. 1 (2020).

99. Sharon Lerner, *Big Pharma Prepares to Profit from the Coronavirus*, INTERCEPT (Mar. 13, 2020, 1:46 PM), <https://theintercept.com/2020/03/13/big-pharma-drug-pricing-coronavirus-profits> [https://perma.cc/NLQ3-ZFZ9]; Gaurav Agrawal et al., *Winning Against COVID-19: The Implications for Biopharma*, MCKINSEY & CO. (Apr. 15, 2020), <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/winning-against-covid-19-the-implications-for-biopharma#the-implications-for-biopharma> [https://perma.cc/A2N4-HQ5N]; Monck, *supra* note 66; Neeraj Kumar & Danny Haydon, *Industries Most and Least Impacted by COVID-19 from a Probability of Default Perspective – March 2020 Update*, S&P GLOB. (Apr. 7, 2020), <https://www.spglobal.com/marketintelligence/en/news-insights/blog/industries-most-and-least-impacted-by-covid-19-from-a-probability-of-default-perspective-march-2020-update> [https://perma.cc/UMR2-SPPB]; Darren Dodd, *COVID-19's Corporate Casualties*, FIN. TIMES (June 22, 2020), <https://www.ft.com/content/eb6efc36-bf99-4086-a98a-7d121738b4b4> [https://perma.cc/K925-FUPW]; Jason Aravanis, *Five Industries Set to Outperform Due to COVID-19*, IBISWORLD (Apr. 7, 2020), <https://www.ibisworld.com/industry-insider/coronavirus-insights/five-industries-set-to-outperform-due-to-covid-19/> [https://perma.cc/LV6M-PHM2]; Rohit Arora, *Which*

fundamentally different from previous major recessions inherent to the economic system, which were primarily caused by financial liquidity constraints within the banking sector.<sup>100</sup> During the COVID-19 fallout, financial markets surprisingly performed relatively well when being compared to real economy constraints.

A rather unexpected effect during the recovery from the first economic shock was the blatantly unequal performance of financial markets compared to actual economic performance. This disjunction between financial markets on the one hand, and real economic activities on the other hand, already emerged as a trend in the 1990s, in the United States in particular in the aftermath of financial market deregulation.<sup>101</sup> Financial performance began to diverge massively from the real economy in 2008/09, but the greatest divergence so far was brought about by the Coronavirus crisis, which widened the gap between top performance of financial markets and negative socio-economic fallout in the real economy.<sup>102</sup>

The finance-real economy gap widened as the finance world could reallocate funds quickly, while the real economy saw liquidity crunches in the wake of lockdowns and consumption drops resulting in closures and bankruptcies echoing in bottlenecks for private households.

Since the onset of a lasting crisis, the novel coronavirus caused a dramatic downturn for general consumption and service sector industries.<sup>103</sup> Mobility, trade and tourism including gastronomy plummeted, even though these sectors usually persist during system-inherent downturns as the freshly laid off typically spend novel-won-leisure time on service sector goods, enjoying vacations, lifestyle entertainment, put-off healthcare and well-being.<sup>104</sup> Yet in the case of the Coronavirus crisis, the lockdowns and social distancing put a halt to leisure consumption.

In the real economy, COVID-19 caused “social volatility” – a collectively

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*Companies Did Well During the Coronavirus Pandemic?*, FORBES (June 30, 2020, 8:10 AM), <https://www.forbes.com/sites/rohitarora/2020/06/30/which-companies-did-well-during-the-coronavirus-pandemic/#17fe6c9b7409> [<https://perma.cc/ACK6-7EZ8>].

100. *Database on COVID-19 Trade Flows and Policies*, WORLD BANK, <https://www.worldbank.org/en/data/interactive/2020/04/02/database-on-coronavirus-covid-19-trade-flows-and-policies> [<https://perma.cc/473G-UYMR>] (last visited July 28, 2020); *Global Economic Prospects*, *supra* note 59.

101. *See generally* BRANKO MILANOVIC, *GLOBAL INEQUALITY: A NEW APPROACH FOR THE AGE OF GLOBALIZATION* (2016); THOMAS PIKETTY, *CAPITAL IN THE TWENTY-FIRST CENTURY* (Arthur Goldhammer trans., 2014). *See also* Raj Chetty & Markus Brunnermeier, *Raj Chetty on the Economic Impacts of COVID-19: Real-Time Evidence from Private Sector Data*, PRINCETON UNIV. BENDHEIM CTR. FOR FIN. (June 17, 2020, 12:30 PM), <https://bcf.princeton.edu/events/raj-chetty-on-the-economic-impacts-of-covid-19-real-time-evidence-from-private-sector-data/> [<https://perma.cc/YRE3-JAS3>].

102. *Changing Places*, *supra* note 11; *The Pandemic Has Caused the World’s Economies to Diverge*, *supra* note 74; *The Peril and the Promise*, *supra* note 74.

103. Tymkiw, *supra* note 78.

104. Puschunder et al., *supra* note 59, at 86; *see generally* Gössling et al., *supra* note 59, at 2.

depressed mood that largely cut consumption and opportunistic spirit. Social distancing led to temporary business closures accompanied by massive layoffs – particularly in the service sector, gastronomy, and tourism industries. Unemployment increased up to 70% in the mid-career segment of these industries.<sup>105</sup> Forty million European workers were switched to short-time schedules to keep them at work.<sup>106</sup> This so-called *Kurzarbeit* labor protection plan encourages firms to reduce work hours instead of laying off or furloughing workers.<sup>107</sup> The OECD and Bloomberg estimate that 19% of workers were furloughed in the UK, 23% in Germany, and 41% in France.<sup>108</sup> In more market-oriented territories, the impact was more severe.<sup>109</sup> For example, in Great Britain unemployment jumped to 5.4%, and in the United States to 8.9%.<sup>110</sup> Coupled with individual households being under lockdown, consumption dropped by 46% in China, 97% in Germany, and 20% in the United States, as well as 78% in the UK in the early months of the pandemic.<sup>111</sup>

The financial world is flexible to exchange COVID-affected industries – such as petroleum, public transport, and the aviation and leisure sectors, such as international hospitality and gastronomy – for COVID-winning industries – such as pharmaceuticals and emergency care, digital communication, fintech, online retail, used automobiles, and interior design with an emphasis on healthy living.<sup>112</sup> To a certain extent, this happens automatically, in particular when badly performing firms drop out of an index (and hence out of index funds) but also in well-maintained sophisticated portfolios. Moreover, portfolio managers can diversify risks *ex ante*, which is why losses from badly performing firms in certain industries will be balanced by gains in winning industries that grew during the pandemic.<sup>113</sup> On the individual firm level, financial managers can benefit from losses in firms by shorting their stock and hedging based on derivatives to avoid exposure to possible declines. For the finance world, it is thus possible to turn losses in the real economy into financial gains. Finance professionals were in a better position to recover once the crisis hit, and certain consumption propensities became apparent. By contrast, firms operating in the real economy typically need time to adapt to changing conditions as they have long-term investments and obligations that can only be adjusted at a relatively higher cost. Just imagine the

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105. *The Peril and the Promise*, *supra* note 74.

106. *The Pandemic Has Caused the World's Economies to Diverge*, *supra* note 74.

107. Jones et al., *supra* note 74 (graphically showing data provided by the International Monetary Fund).

108. *Id.* (showing data provided by the OECD); *see also* Mayhew & Anand, *supra* note 74 (surveying furlough schemes in the United Kingdom and Germany).

109. *See Economy*, *supra* note 74 (tracking several indicia of economic health for several European countries as against the EU as a whole).

110. Jones et al., *supra* note 74; *see also COVID-19: Measuring Unemployment*, CONG. RSCH. SERV. 1 (2020).

111. Jones et al., *supra* note 74.

112. *ECONOMICS IN THE TIME OF COVID-19*, *supra* note 1.

113. Lerner, *supra* note 99; Agrawal et al., *supra* note 99.

difference in capital mobility and liquidity constraints between portfolio investments on the one hand and a small business such as a restaurant, which will have a long-term lease, employees with specific on-the-job training and potentially a set of complex long-term order contracts.

Different than during the 2008/09 World Financial Recession, which came from system-inherent finance market constraints, during the COVID-19 external shock there was a rapid recovery of financial markets, funds and investment banks. For instance, the Financial Times Stock Exchange Index, Dow Jones Industrial Average, and Nikkei plummeted in the first quarter of 2020 drastically.<sup>114</sup> At the same time, Deutsche Bank saw rising earnings after the onset of the Coronavirus crisis in Europe of even up to 43% or 2.4 billion euros in its investment branch in the third quarter of 2020.<sup>115</sup> The Standards and Poor's ("S&P") 500 recovered half of its pre-COVID value in only three months after the crisis hit New York and regained pre-pandemic levels by June 2020 to reach all-time highs from August 2020 and is exhibiting continuously rising trends.<sup>116</sup> Digitalized cryptocurrencies and crowdfunding now also allow investors to further benefit from a crisis of social distancing, bottlenecks, and trade frictions.

In all these features, the strong contrasts between COVID-19 winners and losers widened an already existing gap between financial markets and the real economy, which will likely exacerbate the longer the COVID-19 crisis continues. Not only will differences in the infection risk and the possibility to prevent disease and/or a mild sickness between the two sectors determine continuously rising levels of inequality. In addition, the number of individuals suffering from COVID long-haul symptoms and their belonging to particular social strata will further exacerbate inequality. Deep divides also opened between strongly positive financial market developments and the negative socio-economic fallout performance and increase in harmful lifestyle propensities of the real world. The emotional impact will likely differ depending on whether one can experience the crisis as an opportunity to garner financial gains, or whether one faces liquidity constraints and an increased risk of long-term debilitation. The economic burden

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114. *Id.*

115. *Deutsche Bank Surprises with High Profit*, DW (Oct. 28, 2020), <https://www.dw.com/de/deutsche-bank-%C3%BCberrascht-mit-hohem-gewinn/a-55417971> [<https://perma.cc/9FQS-BHTS>]; Elliot Smith, *Deutsche Bank Swings Back to Profit in Third Quarter, Beats Expectations*, CNBC (Oct. 28, 2020), <https://www.cnbc.com/2020/10/28/deutsche-bank-q3-earnings-2020.html> [<https://perma.cc/QG3F-YVCA>].

116. *Fundamental Chart*, YCHARTS, [https://ycharts.com/charts/fundamental\\_chart/#/?annotations=%5ESPXTR:::level::max:true,min:true&annualizedReturns=false&calcs=id:level,include:true,,&chartType=interactive&chartView=&correlations=&dateSelection=range&displayDateRange=false&displayTicker=false&endDate=06%2F24%2F2020&format=real&legendOnChart=false&note=&partner=basic\\_2000&quoteLegend=false&recessions=false&scaleType=linear&securities=id:%5ESPXTR,include:true,,&securityGroup=&securitylistName=&securitylistSecurityId=&source=false&splitType=single&startDate=03%2F01%2F2020&title=&units=false&useCustomColors&useEstimates=false&zoom=custom](https://ycharts.com/charts/fundamental_chart/#/?annotations=%5ESPXTR:::level::max:true,min:true&annualizedReturns=false&calcs=id:level,include:true,,&chartType=interactive&chartView=&correlations=&dateSelection=range&displayDateRange=false&displayTicker=false&endDate=06%2F24%2F2020&format=real&legendOnChart=false&note=&partner=basic_2000&quoteLegend=false&recessions=false&scaleType=linear&securities=id:%5ESPXTR,include:true,,&securityGroup=&securitylistName=&securitylistSecurityId=&source=false&splitType=single&startDate=03%2F01%2F2020&title=&units=false&useCustomColors&useEstimates=false&zoom=custom) [<https://perma.cc/GCS3-TCM5>] (last visited Apr. 10, 2021).

of long-haul COVID may also fall disproportionately heavily on certain countries, and the means to fund recovery and disability payments to Long Haulers will determine the economic productivity of nations, social classes, and individual household members. In addition to between-country gaps and industry inequality in recovery from the crisis, COVID-19 will likely affect power dynamics between employers and employees in light of long-term COVID disability and debilitation.

When going back in the history of humankind, the 14<sup>th</sup> century black death great plague caused about one third of the known population to die. Previous pandemics already created labor shortages and drivers of mechanization to replace human labor power. Scarce labor increases the bargaining power of workers, but also sets trends to protect human health and replace human capital by mechanization into motion.<sup>117</sup> Labor relations and political dynamics between employers and employees may also shift because of Long Haulers' relation to work. The longer people will be sickened by the virus or experience debilitation after an infection, the more consistently they will avoid contagion risks, for example working in an office with multiple people. The scarcer productive labor power will become, the more likely we will see an appreciation for a healthy productive environment. Professions with less infection risk will draw those entering the labor force for the first time. Imagine the tough decision to become a nurse or doctor, and contrast this with training to become a lawyer or IT expert with the ability to work remotely from home. COVID-19 and the fact that young individuals can end up with a lifetime of debilitation even after mild infections at a young age may alter students' professional preferences and career choices.

## 2. *Deurbanization*

Since the onset of the COVID-19 pandemic, a deurbanization trend has evolved. A massive flow of people moved from large metropolitan areas to more rural spaces to socially distance and enjoy nature while being productive online.<sup>118</sup> COVID-19 has triggered the strongest move toward deurbanization in the United States in modern times, which applies both to private sector industries and families.<sup>119</sup> Given the contagion risk in crowded cities and the technological

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117. Nikolaus Piper, *The Economy of Death*, SÜDDEUTSCHE ZEITUNG (Apr. 10, 2020, 6:51 PM), <https://www.sueddeutsche.de/wirtschaft/pest-coronavirus-wirtschaft-1.4873813> [https://perma.cc/2KCP-QS4E].

118. Dean Donovan, *Deurbanization Rising: Covid-19, Remote Work and Electric Aviation Will Reshape Living Patterns*, FORBES (Nov. 9, 2020), <https://www.forbes.com/sites/deandonovan/2020/11/09/deurbanization-rising-covid-19-remote-work-and-electric-aviation-will-reshape-living-patterns/?sh=5e4b53a55e1d> [https://perma.cc/2K8Q-9AKP]; Jonathan Levin & Claire Ballentine, *Cathie Wood's New York Exit Spotlights Overlooked Florida Region*, BNN BLOOMBERG (Oct. 7, 2021), <https://origin.bnn.ca/cathie-wood-s-new-york-exit-spotlights-overlooked-florida-region-1.1663136> [https://perma.cc/W8H7-UYMY].

119. See EDWARD GLAESER & DAVID CUTLER, *SURVIVAL OF THE CITY: LIVING AND THRIVING IN AN AGE OF ISOLATION* (2021).

challenges of air purification in city skyscrapers with closed ventilation and elevators, COVID-19 precipitated an outflux of corporate headquarters to the suburbs while granting employees the option to work remotely.<sup>120</sup>

The longer COVID rages, the riskier international supply chains will be reshored, and the more will corporate headquarters be moving away from metropolitan areas.<sup>121</sup> While cities are still seen as disadvantaged in controlling the spread of the disease, retail increasingly shifted online to lower the fixed cost of real estate and to mitigate health risks.<sup>122</sup> Demand for personal cars and bikes

120. Somik Lall & Sameh Wahba, *Cities, Crowding, and the Coronavirus: Predicting Contagion Risk Hotspots*, WORLD BANK (Apr. 23, 2020), <https://blogs.worldbank.org/sustainablecities/cities-crowding-and-coronavirus-predicting-contagion-risk-hotspots> [https://perma.cc/VC2P-X34S]; Andrew Marquardt, *We're Finally Getting a Glimpse of What the COVID-Safe Skyscraper Will Look Like*, FORTUNE (Feb. 21, 2021, 6:00 PM), <https://fortune.com/2021/02/21/covid-safe-offices-buildings-skyscrapers/> [https://perma.cc/A5RX-WRDJ]; Ryan Ori, *Worries About COVID-19 Spreading Through the Vents Send Chicago Building Owners in Search of Cleaner Air. 'You Can't Put a Force Field Around Your Property'*, CHI. TRIB. (July 27, 2020), <https://www.chicagotribune.com/columns/ryan-ori/ct-biz-real-estate-air-quality-coronavirus-ryan-ori-20200723-sud25stgvrk5i5x6tkfqm2zkm-story.html> [https://perma.cc/EZ48-SGW2]; Sasha Wedekind, *Covid-19 Catapults Indoor Air Quality to Top of the List*, FORBES (June 10, 2021), <https://www.forbes.com/sites/pikeresearch/2020/06/10/covid-19-catapults-indoor-air-quality-to-top-of-the-list/?sh=151daf5e52cd> [https://perma.cc/XQ5T-YNJB]; *35.9 Million Americans Have Moved. Will Offices Move Too?*, UBER, <https://www.uber.com/blog/americans-business-offices-moving/> [https://perma.cc/8PRU-CTBZ] (last visited Sept. 7, 2021); Richard Florida, *The Uncertain Future of Corporate HQs*, HARV. BUS. REV. (Sept. 18, 2020), <https://hbr.org/2020/09/the-uncertain-future-of-corporate-hqs> [https://perma.cc/5947-27DD]; *States and Cities You Should Consider Relocating Your Office to Post COVID-19*, PRECISION GLOB. CONSULTING, <https://pgcgroup.com/blog/states-and-cities-you-should-you-consider-relocating-your-office-to-post-covid-19> [https://perma.cc/NM7Q-QRFR] (last visited Sept. 7, 2021).

121. Tony Uphoff, *3 Underreported Trends That Will Accelerate Reshoring*, FORBES (Aug. 24, 2020), <https://www.forbes.com/sites/tonyuphoff/2020/08/24/3-underreported-trends-that-will-accelerate-reshoring/#32ee7fe6668e> [https://perma.cc/RW5R-2YV2].

122. Lall & Wahba, *supra* note 120; Marquardt, *supra* note 120; Ori, *supra* note 120; Wedekind, *supra* note 120; Joe McDonald, *Companies Prodded to Rely Less on China, but Few Respond*, AP NEWS (June 29, 2020), <https://apnews.com/bc9f37e67745c046563234d1d2e3fe01> [https://perma.cc/UY3B-U5MZ]; Shinzo Abe, Prime Minister of Japan, Statement at Council on Investments for the Future (Mar. 5, 2020), [https://japan.kantei.go.jp/98\\_abe/actions/202003/\\_00009.html](https://japan.kantei.go.jp/98_abe/actions/202003/_00009.html) [https://perma.cc/BHS4-65KX]; *EU Trade Chief Urges for More Diverse Supply Chains After Crisis*, U.S. NEWS (Apr. 16, 2020), <https://money.usnews.com/investing/news/articles/2020-04-16/eu-trade-chief-urges-for-more-diverse-supply-chains-after-crisis>; see also Vasileios Theodeosopoulos, *The Geopolitics of Supply: Towards a New EU Approach to the Security of Supply of Critical Raw Materials?*, INST. FOR EUR. STUD. 1 (2020); Robert E. Lighthizer, *The Era of Offshoring U.S. Jobs is Over*, N.Y. TIMES, (May 11, 2020), <https://www.nytimes.com/2020/05/11/opinion/coronavirus-jobs-offshoring.html> [https://perma.cc/K4FU-HCC8]; Andrea Shalal et al., *U.S. Mulls Paying Companies, Tax Breaks to Pull Supply Chains from China*, REUTERS (May 18, 2020, 12:03 AM), <https://www.reuters.com/article/us-usa-china-supply-chains/u-s-mulls-paying->

increased, with the average used car price in June 2021 rising 32.7% compared to 2020.<sup>123</sup> Art and culture events were outsourced to more rural communities. Art was re-curated for socially distanced performances, or even staged in newly emerging virtual luxury worlds.<sup>124</sup> Gastronomy temporarily shifted toward ordering in and shared virtual eating experiences.<sup>125</sup> The sharing economy started to offer workspace closer to nature. COVID-19 and the potential long-term negative impetus of a virus infection have not only changed our perception of closeness and close contact with others in dense urban areas, but it has also revolutionized interior design in offices with glass and plastic protection.

The trend toward deurbanization is not only fueled by fears of infection in dense areas, but also by cutting on persistently rising living expenses in cities. Inflationary pressure appears to rise disproportionately in metropolitan areas as housing and other unavoidable costs increase.<sup>126</sup> The so-called “doughnut effect” captures the tendency of urban population moving from large metropolitan areas to the suburbs or even the countryside.<sup>127</sup> Home ownership booms in less densely populated areas – like Arizona, Texas, or Florida – reflect the peoples’ preference

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companies-tax-breaks-to-pull-supply-chains-from-china-idUSKBN22U0FH [https://perma.cc/9K5D-8M6U]; Geoffrey Gertz, *How to Deglobalize*, FOREIGN POL’Y (July 24, 2020, 4:19 PM), <https://foreignpolicy.com/2020/07/24/how-to-deglobalize> [https://perma.cc/BVW9-64Q2]; *The Steam Has Gone Out of Globalisation*, ECONOMIST (Jan. 24, 2019), <https://www.economist.com/leaders/2019/01/24/the-steam-has-gone-out-of-globalisation> [https://perma.cc/A6TJ-LF9E]; *Multinational Companies Are Adjusting to Shorter Supply Chains*, ECONOMIST (July 11, 2019), <https://www.economist.com/special-report/2019/07/11/multinational-companies-are-adjusting-to-shorter-supply-chains> [https://perma.cc/8FFW-VPHA].

123. Mark Vaughn, *Used Car Prices Are Going Nuts! Here Are 10 of the Biggest Price Jumps*, AUTOWEEK (July 30, 2021), <https://www.autoweek.com/news/g37149329/used-car-prices-biggest-increases/> [https://perma.cc/3AVE-HSQA]; Joe McDonald, *Companies Prodded to Rely Less on China, but Few Respond*, AP NEWS (June 29, 2020), <https://apnews.com/bc9f37e67745c046563234d1d2e3fe01> [https://perma.cc/FF2Z-EVU7]; Abe, *supra* note 122; *EU Trade Chief Urges for More Diverse Supply Chains After Crisis*, *supra* note 122; Theodeosopoulos, *supra* note 122.

124. *See Culture Shock: COVID-19 and the Cultural and Creative Sectors*, ORG. FOR ECON. COOP. & DEV. 1 (2020); Vanessa Thorpe, *Covid-19 Forces UK Arts to Seek Virtual Venues and Online Audiences*, GUARDIAN (Mar. 22, 2020), <https://www.theguardian.com/culture/2020/mar/22/covid-19-forces-arts-virtual-venues-online-audiences-cultural-life-shutdown> [https://perma.cc/6NBQ-U4AR]; Laura Feinstein, *‘Beginning of a New Era’: How Culture Went Virtual in the Face of Crisis*, GUARDIAN (Apr. 8, 2021), <https://www.theguardian.com/culture/2020/apr/08/art-virtual-reality-coronavirus-vr> [https://perma.cc/R52G-BSXD].

125. *COVID-19 Era Serves Up Big Changes for U.S. Restaurants*, MORGAN STANLEY (July 17, 2020), <https://www.morganstanley.com/ideas/coronavirus-restaurant-trends> [https://perma.cc/T7WL-CDPN].

126. Julia Margarete Puaschunder, *supra* note 17.

127. Arjun Ramani & Nicholas Bloom, *The Doughnut Effect of COVID-19 on Cities*, VOX EU (Jan. 28, 2021), <https://voxeu.org/article/doughnut-effect-covid-19-cities> [https://perma.cc/DF9M-52ZB].

to escape cities.<sup>128</sup>

With the Biden-Harris administration's decision to recognize long-haul COVID as a disability, the general public has become more aware of the long-term impact of a COVID infection.<sup>129</sup> As long as COVID remains a risk and the road to recovery from a long-haul infection looms large, corporations will have to offer options to work from home to retain a productive workforce. Fearing litigation risk and public pressure, firms will likely be reluctant to force their employees to remain at a desk in a corporate headquarter housed in a congested power city that remains a hotbed of disease as travelers from around the world keep flying in and out. The Doughnut Effect is believed to be a lasting trend due to remote work conditions and social distancing preferences.<sup>130</sup> Deurbanization has already affected market equilibria. For example, the price of used cars rose over the course of the pandemic due to a higher demand in suburban areas and uncertainty about how long people will stay away from large cities.<sup>131</sup> Supply chain shortages of new cars from international markets, such as Asia, contributed to price increases in used vehicles.<sup>132</sup>

Within cities, this massive relocation trend first will continue to drive inequality. Relocation quickly to a more pleasant environment and the flexibility to work online appear as prerogatives of the rich, while those left in metropolitan areas are often unable to afford a second country residence. This is true even more so where, for example, unskilled service workers in metropolitan areas are dependent on consumption by the wealthy.<sup>133</sup> John Maynard Keynes' multiplier effect, which is in this case based on the rich spending money that trickles down to other layers of the economy and society, has been shifting from the city to the suburbs.<sup>134</sup>

In a longer time perspective, however, deurbanization also raises the hope to alleviate social upward mobility inequality, which appears to be more strongly accentuated in cities. Leaving metropolitan areas, in which density and size are

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128. Nicole Friedman, *The Pandemic Ignited a Housing Boom: But It's Different From the Last One*, WALL ST. J. (Mar. 15, 2021, 12:09 PM), <https://www.wsj.com/articles/the-pandemic-ignited-a-housing-boom-but-its-different-from-the-last-one-11615824558> [<https://perma.cc/RTF9-NDS7>]; Jeff Ostrowski, *5 Most and Least Popular States for Americans Who Moved During COVID*, BANKRATE (Feb. 12, 2021), <https://www.bankrate.com/real-estate/states-growing-most-during-pandemic/> [<https://perma.cc/9TTA-B4ZS>].

129. Rubin, *supra* note 8; Press Release, President Joe Biden, *supra* note 54; Cirruzzo, *supra* note 54.

130. Ramani & Bloom, *supra* note 127.

131. Vaughn, *supra* note 123.

132. Ramani & Bloom, *supra* note 127; McDonald, *supra* note 122; Abe, *supra* note 122; *EU Trade Chief Urges for More Diverse Supply Chains After Crisis*, *supra* note 122.

133. Princeton Bendheim Center for Finance, *Markus Brunnermeier on COVID-19 Economic Lessons*, YOUTUBE (Dec. 17, 2020), <https://www.youtube.com/watch?v=-ubV9vqNFZ8> [<https://perma.cc/NBY5-CX4J>].

134. JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST, AND MONEY* (1936).

both negatively associated with performance on upward social mobility, may alleviate this effect within society.<sup>135</sup> Urban density and proximity of city center is negatively correlated with social upward mobility. Moving to urban areas may thus help lower generational inequality.<sup>136</sup>

### 3. *Ecowellness in Agrohoods*

In the suburbs or more rural areas, we can observe an ongoing trend to what can be called “Ecowellness.”<sup>137</sup> Pre-existing prevalence, such as obesity and diabetes, as well as the immune system influence the COVID disease trajectory. Preventive care and whole-rounded lifestyles in harmony with nature thus have gained unprecedented momentum in the wake of COVID-19.<sup>138</sup> Ecowellness sustainable lifestyle innovations concern health and well-being in relation to natural ecological limits.<sup>139</sup> Agri- or agrohoods form in neighborhoods that try to live in harmony with each other and the natural surroundings while also celebrating cultural heritage.<sup>140</sup> The remote workforce now builds wellness cocoons that celebrate healthy living embedded in a supportive community and in harmony with nature.<sup>141</sup>

Long COVID will drive a search for simplicity. Long Haulers appear to have an appreciation for minimalistic stimulation at home and live in harmony with nature. People ordering in spend more time at home during lockdowns. In suburbs, home cooking and minimalism have become COVID long haul trends. Exhausted long-term sufferers are trained to budget their cognitive resources wisely throughout the day and eliminate unnecessary cognitive and harmful influences. The longer COVID exists and the more people will become affected, the less complex the working and daily world will have to become. In the private spaces, Long Haulers are likely prone to eliminate unnecessary items that clog their personal spaces, in which they will likely spend more time during recovery. Within their living spaces, COVID Long Haulers will also likely feel close to nature. Already now, biophilic architecture that resembles the natural environment at home is booming.<sup>142</sup> The fashion world has also introduced

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135. See Raj Chetty et al., *The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility*, NAT. BUREAU ECON. RSCH. 1 (2018).

136. *Id.*

137. *The Agrihoods Are Coming*, AGRITECTURE (June 17, 2021), <https://www.agritecture.com/blog/2021/6/17/the-agrihoods-are-coming> [<https://perma.cc/T2MJ-TM4Q>]; Alli Hurley, *Agrihoods: A New Trend in Lifestyle Living*, GARDEN DESTINATIONS, <https://www.garden-destinations.com/agrihoods-a-new-trend-in-lifestyle-living/> [<https://perma.cc/HAA2-8P3C>] (last visited Sept. 7, 2021)

138. See Salzburg European Declaration from the Gasteinertal: *Interdisciplinary Conference on ‘System change?!’*, ECOWELLNESS GROUP 1 (2021).

139. *Id.*

140. *The Agrihoods Are Coming*, *supra* note 137; *Agrihoods*, *supra* note 137.

141. See Salzburg European Declaration from the Gasteinertal, *supra* note 138.

142. Alex Pearlman, *Living Design Elements Create a Serene, Multisensory, Healing*

sustainable fabrics recently, which were praised during the United Nations Conference of the Parties (“COP-26”) to promote discuss sustainability.<sup>143</sup> Fungus clothing has been celebrated as a carbon-negative and organic alternative to fast fashion in the fashion world.<sup>144</sup>

In public and private spaces alike, cleanliness and hygiene have become monitored and improved as never before. Aerosol sprays, air and water monitoring systems, and air purification systems are now studied, scrutinized, and improved upon. Hygienic antibacterial surfaces optimized for cleanability and technologically enhanced kitchens became prominent as outdoor dining plummeted. Home cooking boomed instead of getting ready to leave the house and spending considerable amounts of time commuting and facing the risk of infection outside.<sup>145</sup>

Attention to healthy nutrition appears to be key for a whole-rounded Long COVID recovery as it helps bring down unwanted inflammation levels. Especially those with gastrointestinal issues and post-viral arthritis appreciate an anti-inflammatory diets, which restrict any intake of too processed foods with additives such as glutamates, histamines, artificial flavors, and preservatives.<sup>146</sup>

While the motivation to leave cities for more rural areas may vary, it becomes apparent that for Generation Long Haulers incentives to move back to cities have to outweigh the perceived health risks given adequate precautions. The longer and

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*Experience*, NEO LIFE (Dec. 24, 2020), <https://neo.life/2020/12/biophilic-homes-prove-nature-is-the-best-medicine/> [<https://perma.cc/A7KN-EHUT>].

143. *Trends Transforming the Sustainable Clothing Industry Outlook in 2021*, LINCHPIN SEO, <https://linchpinseo.com/trends-in-the-sustainable-clothing-industry/> [<https://perma.cc/6DRZ-LVJW>] (last updated Oct. 10, 2021); Vanessa Friedman, *What Was Fashion Doing at COP26?*, WASH. POST (Nov. 17, 2021), <https://www.nytimes.com/2021/11/17/style/cop26-fashion-sustainability.html> [<https://perma.cc/7R3U-YGLN>]; Amy Nguyen, *Fashion Industry's Material Sourcing Under Spotlight at COP26 as UN Fashion Industry Charter for Climate Action Scales Its Commitments*, FORBES (Nov. 9, 2021), <https://www.forbes.com/sites/amynghuyen/2021/11/09/fashions-material-sourcing-under-spotlight-at-cop26-as-un-fashion-charter-scales-its-climate-commitments/?sh=73a367276b1a> [<https://perma.cc/DCV6-QYRJ>]; Emily Chan, *How Fashion is Ramping Up Its Climate Efforts at COP26*, VOGUE (Nov. 9, 2021), <https://www.vogue.com/article/cop26-un-fashion-charter-climate-change-efforts> [<https://perma.cc/9DHN-CQFZ>]; Nicky Harley, *COP26: How Fashion Industry Aims to Make Sustainability Fashionable*, NAT. NEWS (Nov. 8, 2021), <https://www.thenationalnews.com/world/uk-news/2021/11/08/cop26-fashion-leaders-call-on-firms-to-halve-emissions-by-2030/> [<https://perma.cc/U35E-6YM6>]; Rachel Cemansky, *The Fashion Takeaways from COP26*, VOGUE BUS. (Nov. 18, 2021), <https://www.voguebusiness.com/sustainability/the-fashion-takeaways-from-cop26> [<https://perma.cc/E2AQ-6Y7B>].

144. Jessica Wolfrom, *When Fashion is Fungal*, WASH. POST (Aug. 31, 2020), <https://www.washingtonpost.com/climate-solutions/2020/08/31/fashion-mushrooms-mycelium-climate/> [<https://perma.cc/U9R6-MVQM>].

145. Alina Dizik, *Top Interior Design Trends of 2020: From Home Offices to Two-Tone Kitchens*, WALL ST. J. (Aug. 16, 2020, 12:01 AM), <https://www.wsj.com/articles/top-interior-design-trends-2020-11597342299> [<https://perma.cc/9693-KED3>].

146. See *Salzburg European Declaration from the Gasteinertal*, *supra* note 138.

the deeper the life-changing effects of a COVID infection appear, the higher the stakes will have to be to attract the skilled labor force to relocate back to cities and to induce workers to pick up their tasks back in their offices.

In the eye of the rising concern over climate change and the interconnected environmental impact on COVID Long Haulers' well-being partially determined by external stressors, future cities may also see ecologic pricing reforms that take into account the trend toward healthy living and environmentalism.<sup>147</sup> Active cityscape projects may feature forestation to absorb CO<sub>2</sub> from the atmosphere but also governmental incentives for corporations to induce behavioral changes in their workforce.<sup>148</sup> Already now we see a trend towards possessing personal cars.<sup>149</sup> Further behavioral changes will likely force transportation to become more hygienic and individualized. The cities of tomorrow will also have to address intergenerational conscientiousness in protecting elder and low immune system risk groups from contagious diseases.<sup>150</sup>

Corporate settings, industry demands and economic growth will likely stem from attuning to this trend of Ecowellness and sustainable lifestyles in the future.<sup>151</sup> The resiliency of corporations will increasingly require firms to ensure they work toward developing a healthy workforce.<sup>152</sup> Corporations are now incentivized to recruit, adopt, and cultivate 'healthy human capital.'<sup>153</sup> They will be more inclined to hire individuals that do not fall into certain risk groups, which could lead to discrimination due to medical pre-conditions.<sup>154</sup> Corporations will also need to develop practices that avoid contagion of the Coronavirus with their work-force long-term to the extent that it still needs to interact physically.<sup>155</sup> The respective job determines the degree of human contact, which varies by industry.<sup>156</sup> Precautionary measures include vaccination mandates, consulting outsourced staff briefings and trainings, long-term health management and prevention in teams, just to name a few advancements of the workplace towards a healthier and more consciously precautionous environment.<sup>157</sup>

Home office options and remote working will likely be expanded in light of

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147. *Id.*

148. Julia M. Puaschunder, *The Green New Deal: Historical Foundations, Economic Fundamentals and Implementation Strategies*, DUKE U. SCH. L. (Oct. 30, 2020), <https://sites.law.duke.edu/thefinregblog/author/julia-m-puaschunder/> [<https://perma.cc/LR3E-XHT4>].

149. Vaughn, *supra* note 123.

150. Julia Puaschunder, *The Future of the City After COVID-19: Digitalization, Preventism and Environmentalism*, CONSCIENS CONF. PROC., 125, 125 (2020).

151. *See Salzburg European Declaration from the Gasteinertal*, *supra* note 138.

152. Gelter & Puaschunder, *supra* note 16.

153. *Id.*

154. *Interdisciplinary, Multimedia Conference*, *supra* note 12; Puaschunder et al., *supra* note 98.

155. Gelter & Puaschunder, *supra* note 16.

156. *Id.*

157. *See* Julia M. Puaschunder, *From Homo Oeconomicus to Homo Praeventicus*, PROC. 19<sup>TH</sup> RSCH. ASS'N FOR INTERDISC. STUD. 153 (2020).

COVID long-haul risks.<sup>158</sup> In New York, only 28% of the workforce have returned to their workspaces.<sup>159</sup> A survey of 278 executives conducted by McKinsey found that office space is expected to decline by an average of 30% in the near future.<sup>160</sup> This is partly due to employees enjoying working from home as the Pew Research Center found in surveying 5,858 U.S. employees during fall of 2020. 49% of respondents reported having more flexibility while working from home, and 38% found it helped balance work and family responsibilities.<sup>161</sup> In fact, 65% of U.S. teleworkers surveyed found online tools – such as video conferencing and instant messaging – as a good substitute for in-person contact.<sup>162</sup> Business travel is therefore expected to drop by 20%.<sup>163</sup> Inequality gaps open as low-wage workers are more likely at risk of needing to switch their jobs or be unemployed due to an automatization and Artificial Intelligence shock.<sup>164</sup>

In light of the COVID long-haul threat and breakthrough cases, employees are expected to continue to work remotely — or at least follow a hybrid model in which only a reduced staff is at the premises concurrently. Employees afraid of COVID will give employers a hard time finding adequate human-facing labor.<sup>165</sup> Having experienced a great labor shortage, employers will likely face pressure to create a safe and secure working environment.<sup>166</sup> Rising tort liability risks for employers can be mitigated by hiring health consulting agents.<sup>167</sup>

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158. Chip Cutter, *Remote Work May Now Last for Two Years, Worrying Some Bosses*, WALL ST. J., (Aug. 22, 2021, 5:30AM), <https://www.wsj.com/articles/remote-work-may-now-last-for-two-years-worrying-some-bosses-11629624605> [<https://perma.cc/G3BY-SDVU>].

159. Emily Walsh, *Only 28% of New York City Workers Have Returned to the Office, According to a New Survey*, BUS. INSIDER (Nov. 10, 2021, 2:44 PM), <https://www.businessinsider.com/only-28-percent-new-york-city-workers-returned-to-office-2021-11> [<https://perma.cc/RA6Y-YYJL>].

160. *The Future of Work After COVID-19*, MCKINSEY & CO. (Feb. 18, 2021), <https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19> [<https://perma.cc/2ACW-UAJ8>]; Brienne Walsh, *How Work Life is Changing: Again*, SYNCHRONY (July 14, 2021), <https://www.synchronybank.com/blog/millie/how-work-life-is-changing/> [<https://perma.cc/9APD-A24T>].

161. Kim Parker et al., *How the Coronavirus Outbreak Has – and Hasn't – Changed the Way Americans Work*, PEW RSCH. CTR. (Dec. 9, 2020), <https://www.pewresearch.org/social-trends/2020/12/09/how-the-coronavirus-outbreak-has-and-hasnt-changed-the-way-americans-work/> [<https://perma.cc/D5WT-VM9K>]; Walsh, *supra* note 160.

162. *Id.*

163. *Id.*

164. *Id.*, *The Future of Work After COVID-19*, *supra* note 160; Walsh, *supra* note 160.

165. Stella Yifan Xie & Liyan Qi, *Chinese Factories Are Having Labor Pains: 'We Can Hardly Find Any Workers'*, WALL ST. J., (Aug. 25, 2021, 5:30 AM), [https://www.wsj.com/articles/chinese-factories-are-having-labor-pains-we-can-hardly-find-any-workers-11629883801?st=n4ymwhvkdlscep5&reflink=article\\_email\\_share](https://www.wsj.com/articles/chinese-factories-are-having-labor-pains-we-can-hardly-find-any-workers-11629883801?st=n4ymwhvkdlscep5&reflink=article_email_share) <https://perma.cc/46LS-496S>.

166. *The Great American Labor Shortage*, WALL ST. J. (June 8, 2021), <https://www.wsj.com/articles/the-great-american-labor-shortage-11623191784> [<https://perma.cc/4G6V-L64M>].

167. *Id.*

Already now in Germany being infected with COVID-19 can be considered a workplace-related accident if the infection happened at the workplace premises and/or a human-contact with co-workers, clients or customers led to it.<sup>168</sup> After filing for a workplace accident claim, there is likely an investigation to follow if the employer was offering working conditions in line with governmental regulation with a particular focus on prevention.<sup>169</sup> In certain professions, a COVID infection is considered an occupational disease due to high exposure to other people. For instance, healthcare and medical examination practitioners, opticians, social services, but also wellness and pedicure professionals can count that they have high risks of exposure to the virus in their work.<sup>170</sup> Unclear remains the status of professions such as bus and train drivers, logistics and delivery services but also aviation, flight attendants and school and kindergarten teachers.<sup>171</sup>

Recognition of COVID infections as workplace-related accidents is an important prerequisite for cost coverage of documentation, treatment and rehabilitation beyond the medical sphere including social factors.<sup>172</sup> For instance, in the case of a Long COVID trajectory, a workplace-related infection can aid in acquiring social service benefits and a potential transition to a different profession or workplace if there is a long-term disability or disabling condition that hinders continuous working.<sup>173</sup> Besides health and social insurance, also the family is covered in case the infection at the workplace has led to death.<sup>174</sup>

In order to avoid a COVID infection in the corporate sector to begin with, the German *Präventionsgesetz* or *Prevention Act*<sup>175</sup> allocates governmental funding to corporations for prevention measures and building team sports.<sup>176</sup> The COVID pandemic has elevated employers to create a healthy and hygienic work environment with thoughtful interaction, constantly tracking workforce safety and requiring health self- and group monitoring. Benefits that harness mental health and physical wellbeing take center stage and even outperform financial wellness planning after COVID.<sup>177</sup> Already now, many workers look forward to retiring

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168. Klaus Deuse, Corona Virus as an Accident at Work, DEUTSCHE WELLE (May 21, 2021), <https://www.msn.com/de-de/finanzen/top-stories/corona-virus-als-arbeitsunfall/ar-AAKh9ev?ocid=msedgdhp> [<https://perma.cc/LQ7M-YQY9>].

169. *Id.*

170. *Id.*

171. *Id.*

172. *Id.*

173. *Id.*

174. *Id.*

175. *Prevention Act*, BUNDESMINISTERIUM FÜR GESUNDHEIT, <https://www.bundesgesundheitsministerium.de/service/begriffe-von-a-z/p/praeventionsgesetz.html> [<https://perma.cc/2XKX-8LR4>] (last updated Aug. 6, 2019).

176. *Interdisciplinary, Multimedia Conference, supra* note 12.

177. *Benefits Take Center Stage: The Pandemic Spotlights the Importance of Employee Benefits Now More Than Ever*, UNION BANK SWITZ., <https://www.ubs.com/us/en/wealth-management/our-services/ubs-workplace-wealth-solutions/workplace-wealth-solutions-thought->

early, and the COVID long haul generation will likely exacerbate this trend.<sup>178</sup>

Those who work enjoy home office flexibility that outsources workplace health risks, while office glass walls in interior designs are being placed for security protection in workplace premises.<sup>179</sup> The downside of remote work, however, lies in problems of accountability and stagnation in promotions as there is less oversight of performance in a home office.<sup>180</sup> Industries that have already established online quality control in place, will likely have a competitive advantage.

The coronavirus crisis has highlighted the importance of prevention as a necessary prerequisite for health in general medicine. Self-conscious prevention and the general status of the immune system have proven to be decisive prerequisites for whether a COVID-19 infection turns out to have a severe or only a mild disease trajectory.<sup>181</sup> Even when an initial coronavirus infection is mild, among about 10-50% of those previously infected the body becomes symptomatic in the long term, with the immune system becoming unbalanced and/or overshooting.<sup>182</sup> The diffuse symptoms of long COVID are not yet fully understood, as there may be a complex interplay with genetic predispositions and environmental circumstances. While the waves of symptoms faced and recovery of COVID-19 Long Haulers are still not clear, recent evidence suggests that external and synthetic influences can trigger an overshooting immune reaction that causes harm to one's own body.<sup>183</sup> Scholars have therefore suggested that Long-Haul patients and chronic disease sufferers will become aware of and hypersensitive to their surroundings, resulting in a preference for balance and harmony with the natural environment rising.<sup>184</sup> Generation COVID-19 long-haul will likely shift towards a healthy lifestyle with awareness for environmental balance. Attention to protect the environment but also caution to avoid drug residues in the groundwater will spring out from the wish to create a non-stressful surrounding without environmental stressors and/or inflammation triggers.

With international trade still being in a downturn and international value chains becoming riskier and more expensive, consumers attuned to their surroundings have developed an interest in shopping locally.<sup>185</sup> First attempts to

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leadership/workplace-voice.html [https://perma.cc/Rf4A-KG2L] (last visited Sept. 10, 2021).

178. *Id.*

179. Walsh, *supra* note 160.

180. Emma Harrington & Natalia Emanuel, *'Working' Remotely? Selection, Treatment, and Market Provision of Remote Work*, HARVARD, <https://scholar.harvard.edu/eharrington/publications/working-remotely-selection-treatment-and-market-provision-remote-work> [https://perma.cc/X9RK-MF72] (last updated Apr. 9, 2021).

181. *Salzburg European Declaration from the Gasteinertal*, *supra* note 138; Gelter & Pauschunder, *supra* note 16.

182. Hart, *supra* note 9.

183. Drbein Medical Lectures, *supra* note 10.

184. *Salzburg European Declaration from the Gasteinertal*, *supra* note 138; Gelter & Pauschunder, *supra* note 16.

185. Lighthizer, *supra* note 122; Shalal et al., *supra* note 122; Gertz, *supra* note 122; *The*

eliminate points of contraction in stores include online delivery services, which may in the future be enhanced by drones. With people enjoying time off work in their Ecowellness hubs, low-paying service industry jobs with high human touchpoints - such as nursing, flight attendants, restaurant waiters, etc. - will face massive staffing shortages. Labor supply shortages have and will continuously increase labor bargaining power and drive-up worker salaries but may also increase corporate social responsibility pressures to create a positive work-life balance in harmony with nature.

#### 4. *Socio-Psychological Evolution Impacting Labor Dynamics*

Speculation about prehistoric situations where humans survived in caves serves as a useful analogy for lockdowns. Researchers at the University of Vienna study the group dynamic and socio-psychological impact of crises as a driver of human advancement.<sup>186</sup> As these researchers outline, seclusion in caves held enormous potential for human and societal development, which may also apply regarding COVID.<sup>187</sup> During periods when natural disasters made exterior living conditions dangerous, paleolithic humans developed so-called “cave competencies.” These key competencies grew when people had to seclude themselves from society – e.g., during natural disasters, volcanic eruptions, but also during seclusion of later-following pandemics, such as the great plague of the 14<sup>th</sup> century. Historically, crises often became hallmarks of societal advancement after all.<sup>188</sup> Times of societal pressure often advanced to shock therapies pushing humankind toward social advancement, for some parts due to a stark natural selection effect.<sup>189</sup> “Cavers” were more likely to estimate risks and imagine future consequences, and they were able to maintain a natural circadian rhythm without being guided by changes in natural light.<sup>190</sup> Psychologically stronger, more self-reflective and cooperative individuals with better sensitivity to the passage of time, a better ability to discount risk over time, and with better social competencies had a natural advantage when caving together.<sup>191</sup> According to this theory, humans in seclusion learned to live by themselves and handle their emotions during stress, but also developed better imagination.<sup>192</sup>

Drawing inferences from the potential rise of “cave competences” during the

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*Steam Has Gone Out of Globalisation, supra note 122; Multinational Companies Are Adjusting to Shorter Supply Chains, supra note 122.*

186. See Jürgen Grimm, *Conspiracy Theories in Times of Crises: Methods and Results of an Online Survey*, U. VIENNA (Nov. 2020), [https://empcom.univie.ac.at/fileadmin/user\\_upload/p\\_empcom/pdfs/Grimm2020\\_ConspiracyTheory\\_ResearchTalk\\_6.pdf](https://empcom.univie.ac.at/fileadmin/user_upload/p_empcom/pdfs/Grimm2020_ConspiracyTheory_ResearchTalk_6.pdf) [<https://perma.cc/FJ3X-GGMV>].

187. *Id.*

188. *Id.*

189. *Id.*

190. *Id.*

191. *Id.*

192. *Id.*

currently ongoing pandemic, pro-active care for maintaining a healthy workforce will become an essential corporate feature to attract qualified labor, whose bargaining power has already increased because of labor shortages in human-facing industries and positions.<sup>193</sup> The long-haul prospect and prolonged COVID pandemic has raised U.S. job openings to historic highs and the share of U.S. corporations not being able to fill positions has increased to 15%, which accounts for a record highest rate ever measured.<sup>194</sup> At the same time, more workers are quitting with the job quit rate at an all-time high at 2.7% in June 2021.<sup>195</sup>

Long COVID will likely drive this power dynamic shift even further and extend it to other industries, once natural supply-demand dynamics in the labor market kick in. The overall long-term well-being of employees including preventive care in teams will become a key issue and competitive advantage to attract a productive workforce for employers of tomorrow. Learning-in-teams to prevent virus contagion will become a new endogenous growth factor when considering the risk of long-term debilitation of trained key personnel after a COVID-19 infection.<sup>196</sup>

Future employers will likely naturally but also will have to develop empathy and a holistic understanding of health. In work teams responsible self-care of prevention in harmony with society and the environment will prevail. A shared culture of group prevention efforts will play a key role. Salutogenesis funded and supported by the employer nurturing a healthy and ecologically harmonious lifestyle will be a future competitive advantage in the labor market that helps attract scarce labor. Working from home will have changed employees to become more independent and sensitive to personal time, but they will also be more focused on the health and well-being of their immediate surroundings.<sup>197</sup>

In light of growing concerns over COVID long-haul risks but also addressing the newest findings about the interaction of environmental influences on long-haul conditions, employers will likely have a pioneering first mover advantage if they pay attention to the holistic expertise for prevention standards. For instance, quick and accurate COVID tests, screening of employee healthcare status but also providing a safe and secure work environment will be crucial. This means that the environment will be constantly monitored for harmful influences.

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193. Whelan, *supra* note 14.

194. Ghilarducci, *supra* note 14; Whelan, *supra* note 14.

195. *Id.*

196. Puaschunder et al., *supra* note 98.

197. Recognizing the Duty of the Federal Government to Create a Green New Deal, H.R. 109, 116th Cong. (2019); Edward Barbier, *A Global Green New Deal*, UNITED NATIONS, <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=670&menu=1515> [<https://perma.cc/AF4T-Y4QF>] (last visited Jan. 11, 2021); *see also* Mariana Pargendler, *The Rise of International Corporate Law*, EUR. CORP. GOVERNANCE INST. 1 (2020) (providing a historical overview of UN initiatives relating to ESG, particularly climate change); Letter from Members, Earthworks, to Representatives, 116th Congress (Jan. 10, 2019), <https://earthworks.org/publications/group-letter-to-congress-urging-green-new-deal-passage/> [<https://perma.cc/A2L3-FXMA>]; Puaschunder, *supra* note 148.

Standards for safety and security provided by protective masks but also a healthy stable in-house nutrition based on an informed understanding of the individual's personal dietary needs will become implicit benefits to attract labor and make a difference when scarce labor decides between potential employers.<sup>198</sup> Certain Ecowellness standards even go as far as to regulate the ecological, health and social criteria for nutrition, including vegan products.<sup>199</sup> Fringe benefits provided by employers may be extended to include holistic preventive care and foresighted vigilance but also insurance coverage for long-term disability after a workplace-induced COVID infection. Legal implications, insurance coverage in the entire social compound but also privacy considerations when dealing with sensitive personal health status information in the workforce over time are rising legal, economic, discriminatory, and ethical challenges that may imply risks such as discrimination, litigation and erosion of the social glue. Multi-faceted predicaments will likely arise in the shadow of all these novel developments for Generation COVID Long-Haul.

Salutogenic prevention is currently imbued in the work cultures. Governmental support in large-scale regulation and subsidies could support prevention and holistic healthcare.<sup>200</sup> The non-specific immune system response to COVID in Long Haulers will require workplaces to be in harmony with the environment. Long Haulers will strive to eliminate stress, which will also require society to limit weather-related problems in light of climate change. Current levels of global warming are causing weather extremes, which can exacerbate unnecessary stress levels. All such wide-scale transformation can be guided by the Green New Deal and the European Sustainable Taxonomy targeted at stabilizing a favorable climate and livable environment based on classifying industries and policies' effects on human health and well-being.<sup>201</sup> Public crowd events will likely also require more precaution and an implicit understanding of care for others' well-being. Civil networks, independent scientists and favorable framework conditions in line with the "Green Deal" pledge can change entire communities and revive the self-determined idea of health in harmony with the environment during our turbulent time.<sup>202</sup>

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198. *Salzburg European Declaration from the Gasteinertal*, *supra* note 138.

199. Grimm, *supra* note 186.

200. *Id.*

201. Barbier, *supra* note 197; *see also* Pargendler, *supra* note 197 (providing a historical overview of UN initiatives relating to ESG, particularly climate change); Letter from Members, Earthworks, *supra* note 197; H.R. 109; *A European Green Deal*, Eur. Comm'n, [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en) [<https://perma.cc/M36E-H7A9>] (last visited Jan. 11, 2021); Puaschunder, *supra* note 148; *The Biden Plan for a Clean Energy Revolution and Environmental Justice*, Biden Harris, <https://joebiden.com/climate-plan/> [<https://perma.cc/FVU8-KTZT>] (last visited Jan. 11, 2021).

202. Alexandra Samuel, *How Working from Home Has Changed Employees*, WALL ST. J., (June 12, 2021, 8:00 AM), <https://www.wsj.com/articles/working-from-home-employees-1162343249> [<https://perma.cc/GN7M-SKLE>].

## *B. Digitalization and Democratization of Healthcare Information*

### *1. Isolation of Generation Lockdown and the Digitalization Boom*

As discussed in section 3.1.4, in the history of humankind, the ability to use imagination and to innovate often prospered when humans were isolated during times of crises. Not to idealize COVID lockdowns or envisioning flying to Mars these days, the novel Coronavirus pandemic has shock-forced Generation COVID Lockdown to socially-distance as never before during modernity.<sup>203</sup> As the fear of a virus contagion through human contact led to lockdowns in all major economies around the globe, the power of digitalization became the source of touchpoint-less contact with the social compound during the pandemic.

In modern COVID ‘caves,’ imagination is currently stimulated in virtual online worlds that reached unprecedented sophistication during the crisis.<sup>204</sup> While many COVID Long Haulers locked their doors to keep out aerosols and the actual physical surroundings’ importance faded, laptop windows to the world became the most important ever-open gate to escape, communicate and socialize at any given time of day or night.<sup>205</sup>

The economic recovery after COVID-19 is expected to be digital.<sup>206</sup> The longer and riskier a COVID infection risk is perceived to prevail, the more will society adjust to digitalized interaction and truly global information exchange.<sup>207</sup> COVID-19 accelerated an already ongoing digitalization disruption.<sup>208</sup> Algorithms, robotics, and big data insights have experienced more widespread use and general acceptance within society during the COVID-19 crisis.<sup>209</sup>

Digitalization accounts for a booming industry in the wake of the COVID-19 pandemic. The workforce is now more than ever before divided on skills relating

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203. See *Preventing a ‘Lockdown Generation’ in Europe and Central Asia*, United Nations Child. Fund 1 (2020).

204. Grimm, *supra* note 186.

205. Tanya Basu, *Covid-19 “Long Haulers” Are Organizing Online to Study Themselves*, MIT TECH. REV. (Aug. 12, 2020), <https://www.technologyreview.com/2020/08/12/1006602/covid-19-long-haulers-are-organizing-online-to-study-themselves/> [<https://perma.cc/RLC2-DQVR>].

206. *Id.*, see also *The Next Normal: The Recovery Will Be Digital*, MCKINSEY & CO. 1 (2020).

207. Alfea Jamal, *Coronavirus Pandemic: Fear and Dread Haunt Covid-19 ‘Long-Haulers’ Months After Infection*, HINDUSTAN TIMES (Sept. 3, 2020), <https://www.hindustantimes.com/health/coronavirus-pandemic-fear-and-dread-haunt-covid-19-long-haulers-months-after-infection/story-eYW9zL5u3jFrVgS1qaEzqN.html> [<https://perma.cc/WJS8-J6CP>].

208. See generally Julia M. Puaschunder & Martin Gelter, *The Social Representations and Legal Theory of Artificial Intelligence, Robotics and Big Data in Healthcare* (June 11, 2020) (unpublished manuscript) (discussing a survey on the intersection of these sectors).

209. See Julia M. Puaschunder, *Artificial Intelligence Market Disruption*, RSCH. ASS’N FOR INTERDISC. STUD. 1 (2019); *Digi-Disruption & New Age Renaissance*, TUTHETOP ALUMNI CLUB, <https://tuthetop-alumni.at/digidisruption/> [<https://perma.cc/ST3B-LF4N>] (last visited Dec. 30, 2021).

to technology use and human-machine compatibility.<sup>210</sup> Those with better access to internet connectivity and greater affinity toward technology (i.e., computer and Artificial Intelligence literacy) have growing competitive advantages. The already pre-pandemic existing gap between e-skilled and e-unskilled workers based on novel technology adoption has widened since the outbreak of COVID.<sup>211</sup> The worldwide lockdowns, social distancing, and remote work solutions in all major economies increased a worldwide rapid adoption of instant communication tools, social engagement, and entertainment platforms.<sup>212</sup>

The COVID-induced deurbanization described in section 3.1.2. was therefore not comparable to a ruralization. People in the suburbs or in smaller towns did not give up luxuries of metropolitan areas, such as the exchange of goods, services, and ideas in highly specialized markets with diverse market actors. Today's cosmopolitan luxury shifted into virtual online spaces as COVID-19 unprecedentedly expanded the reach of the online tech world. Physically distant, we became digitally closer. Data traffic increased around the world but also in speed.<sup>213</sup> An online multitasking workforce gained global reach, while technology reduced bureaucracy.<sup>214</sup> Digitalization affected all industries and is expected to revolutionize medical care of the future.<sup>215</sup>

Historically, ancient epidemics were turning points that eventually fostered innovation in mechanization given human labor shortages and reductions in productive capacity.<sup>216</sup> Persistent and recurring COVID-19 lockdowns in combination with the potential for reinfection among already traumatized Long Haulers will likely turn society more and more toward digitalization for purposes of social interaction, information exchange, productivity, and entertainment.<sup>217</sup>

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210. See Charles I. Jones & Paul M. Romer, *The New Kaldor Facts: Ideas, Institutions, Population, and Human Capital*, NAT'L BUREAU ECON. RSCH. 1 (2009).

211. GLAESER & CUTLER, *supra* note 119; Kathryn E. Bouskill & Scott W. Harold, *Inequality in Opportunity to Work from Home an Underlying Condition Likely Aggravated by the Pandemic*, RAND CORP. (May 14, 2021), <https://www.rand.org/blog/2021/05/inequality-in-opportunity-to-work-from-home-an-underlying.html> [<https://perma.cc/N35F-V24H>]; Julia M. Puaschunder, *Nudgital: Critique of a Behavioral Political Economy*, 5 ARCHIVES BUS. RSCH. 54, 57-59 (2017).

212. See Titus Corlatean, *Risk, Discrimination and Opportunities for Education During the Times of COVID-19 Pandemic*, RSCH. ASS'N FOR INTERDISC. STUD. 37 (2020).

213. Joseph Johnson, *Coronavirus: Impact on Online Usage in the U.S.: Statistics & Facts*, STATISTA (Apr. 29, 2021), <https://www.statista.com/topics/6241/coronavirus-impact-on-online-usage-in-the-us/> [<https://perma.cc/STP8-M6PX>].

214. Nina Owcharenko Schaefer, *Removing Obstacles, Cutting Red Tape, and Staying Flexible in Responding to COVID-19*, HERITAGE FOUND. (Mar. 25, 2020), <https://www.heritage.org/public-health/commentary/removing-obstacles-cutting-red-tape-and-staying-flexible-responding-covid> [<https://perma.cc/ADR8-FJBA>].

215. GLAESER & CUTLER, *supra* note 119.

216. Piper, *supra* note 117.

217. Phebe Tucker & Christopher S. Czapla, *Post-COVID Stress Disorder: Another Emerging Consequence of the Global Pandemic*, PSYCHIATRIC TIMES (Jan. 8, 2021), <https://www.psychiatristimes.com/view/post-covid-stress-disorder-emerging-consequence-global-pandemic>

Remote work solutions influence labor relations and change the bargaining power of capital relative to labor.<sup>218</sup> The specific new balance will depend largely on the degree of digitalization of the employee's job, and on the e-versed specialization of their human capital.<sup>219</sup> Human capital will become less firm-specific where remote work becomes the norm, given that employers can recruit employees on an international scale with the internet making the whole world labor force available at a mouse click.<sup>220</sup>

## 2. *Artificial Intelligence-Enhanced Medical Care and Online Healthcare Information Exchange*

During the pandemic, robotics began to facilitate patient care and hygiene tasks around COVID infected. Robots have also taken on everyday supply chain tasks, such as self-driving trucks, shelving groceries, administering checkouts or delivering items with drones.<sup>221</sup> In the household, robots are becoming useful as cleaning, cooking and household devices. During the pandemic, more and more decision making became outsourced to algorithms. In the future lawyers, doctors, finance professionals and secretary tasks are expected to become more and more replaced by computers and artificial intelligence.<sup>222</sup>

Digitalization could also come in handy in the search for practical disability support for Long Haulers. Artificial Intelligence, robotics and big data may offer essential complements to fill in for long-haul attention and productivity deficits gaps that may occur in waves. Robotics and automated computer systems promise to help COVID Long Haulers navigate through complex situations of information overload.<sup>223</sup> Artificial Intelligence could offer the opportunity to aid Long Haulers in dealing with a complex world when waves of fatigue set in unexpectedly and unpredictably. For instance, already now computer programs and algorithms can learn how individuals respond and serve as secretaries to book appointments or

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[<https://perma.cc/Q29U-QVXK>].

218. Gelter & Puaschunder, *supra* note 16.

219. *Id.*

220. *Id.*

221. Scott Tong, *Pandemic Innovation: Supermarkets Invest in Robot Pickers as Online Ordering Takes Off*, MARKETPLACE (Mar. 12, 2021), <https://www.marketplace.org/2021/03/12/pandemic-innovation-supermarkets-invest-in-robot-pickers-as-online-ordering-takes-off/> [<https://perma.cc/4LNM-A4UV>]; see also Zeashan Hameed Khan et al., *Robotics Utilization for Healthcare Digitalization in Global COVID-19 Management*, 17 INT. J. ENV'T RSCH. & PUB. HEALTH 3819 (2020); Sergio D. Sierra Marín et al., *Expectations and Perceptions of Healthcare Professionals for Robot Deployment in Hospital Environments During the COVID-19 Pandemic*, 8 FRONTIERS ROBOTICS & AI 1 (2021); Théo Schöpfer & Reza Etamad-Sajadi, *The Clever Use of Robots During COVID-19*, EHL INSIGHTS, <https://hospitalityinsights.ehl.edu/robots-during-covid-19> [<https://perma.cc/7FBN-3E3T>] (last visited Aug. 26, 2021).

222. See Julia M. Puaschunder, *The Legal and International Situation of AI, Robotics and Big Data with Attention to Healthcare*, EUR. PARLIAMENT AGENCY 1 (2019).

223. *Id.*

structure workflows.<sup>224</sup>

Future advances in digitalization in the medical sector also lie in bundling information for the prevention of pandemics and tracking medical resources.<sup>225</sup> The digital age features real-time information recording in combination with unprecedented data storage opportunities and computation power, such as Bayesian analytics, and has created the most innovative advancements to improve human lives with digitalization.<sup>226</sup>

In the medical sector, individual medical information could be interpreted in the context of larger datasets in order to diagnose and predict the individual health status and likely outcomes of COVID infections and other medical conditions. To prevent future pandemics, mobile monitoring and digital health resource tracking will play an unprecedented role. Thanks to new technologies for self-motivated health monitoring, it is currently possible for everyone to track their health independently and change their lifestyle over a longer time horizon self-determined. Individualized health status apps are currently being developed to track body functions and detect virus infections in real-time. Big data that is used to obtain objective disease risk and outcome trajectories every person faces can aid in optimizing one's lifestyle and health to prevent negative lifestyle choice consequences early on.<sup>227</sup> Currently emerging innovations in this realm include real-time monitoring of the immune system and microchips for tracking biomarkers. Big data and the use of Bluetooth technology for a cartography of healthcare devices are prospectively used to overcome bottlenecks allocation problems and combat the misuse of resources.<sup>228</sup>

Digitization enables access to medical information worldwide without the risk of corruption by creating telehealth services and allowing users to gather preliminary information in internet forums. Insights derived from massive amounts of data can be used for widescale prevention, diagnosis and healing. New technologies can now relate personal symptom prevalence to psycho-social tendencies and general environmental influences and risk factors in order to redefine salutogenesis truly holistically.<sup>229</sup> In light of the enormous potential to digitally monitor and track healthcare statuses worldwide and over time, big data offers an enormous potential to detect the outbreak of pandemics early on but also the possibility to capture widespread health trends and group reactions.

COVID-19 Long Haulers may trigger large-scale societal trends by initiating a widespread Artificial Intelligence revolution that will comprise IT solutions for medical self-monitoring, constant health status tracking and real-time scanning of the environment for harmful influences. New possibilities for data storage and

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224. Ivan Stevanovic, *Free Appointment Scheduling Software: Our Top Picks*, SMALL BIZ GENIUS, (Dec. 30, 2021), <https://www.smallbizgenius.net/free-appointment-scheduling-software/#gref> [<https://perma.cc/XJ93-HF6W>].

225. *Interdisciplinary, Multimedia Conference*, *supra* note 12.

226. *Id.*

227. *Id.*

228. *Id.*

229. *Id.*

evaluation open up previously unforeseen ways to allow users of social networks to develop holistic healthy lifestyles and take measures to prevent illness.<sup>230</sup> As never before in the history of humankind, individuals are now monitoring their health status in real time and find themselves online to evaluate medical goods and services together.

Already now during the ongoing pandemic, COVID Long Haulers began to seek fast, easy and truly global access to information about potential remedies for their condition, which are typically not provided by standard medical care.<sup>231</sup> Long Haulers have already found themselves in online self-help groups – such as the Facebook Survivor Corps – or decentralized information exchange – such as the Patient Research COVID-19 platform, a patient-led research collaborative<sup>232</sup> – for quick and unbureaucratic information exchange about an emerging group phenomenon. Social online media platforms were instrumental in detecting that COVID may cause a long-lasting health effect that may kick in with an even longer time lag than the standard incubation time and may show surprising body and psychological changes. Social online media captured this trend early on. In digitalized platforms, Long Haulers gathered information self-determinedly in online surveys during a time when COVID emergency hospitalization was precluded by a surge of severe COVID cases.

In the future, instant information exchange on social media may also lead to a democratization of healthcare information without medical professionals as gatekeepers. Fear of attending hospitals or seeking medical aid at potential viral transmission points has already created a wave of telemedicine and online healthcare information exchange. Especially in the Long Hauler segment, where novel, diffuse and often unclarified symptoms appear in waves, laypeople are already turning to fast and easy information exchange in online social media self-help groups, such as the Facebook Long Hauler Survivor Corps groups. These groups serve as open forums to discuss potentially unfamiliar symptoms. As the list of COVID Long-Haul long-term debilitation continues to expand, Long Haulers are in the search for fast relief online. Social media networks provide widespread options for gathering and strategically collecting crowd opinions on Long COVID remedies but also provide socio-psychological support from fellow sufferers. Guided lifestyle monitoring in a social self-help group can strengthen self-confidence and social cohesion in online forums.

These Long Haulers meet online to discuss their pressing symptoms and to crowdsource information on currently evolving trends in medical care in order to then inform scientists based on their amalgamated narrative data.<sup>233</sup> In this service, COVID Long Haulers see themselves as citizen scientists who organize

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230. *Id.*

231. Basu, *supra* note 205.

232. *About the Patient-Led Research Collaborative*, PATIENT-LED RSCH. COLLABORATIVE, <https://patientresearchcovid19.com/> [<https://perma.cc/TRS2-Q5TQ>] (last visited Dec. 30, 2021).

233. Amy Dockser Marcus, *Covid-19 Patients Are Doing Their Own Research*, WALL ST. J. (Jan. 30, 2021, 12:01 AM), <https://www.wsj.com/articles/covid-19-patients-are-doing-their-own-research-11611982860> [<https://perma.cc/R7LY-JP6L>].

information – for example through online surveys – and make their findings available to scientists, industry and government representatives in order to improve the current health system.<sup>234</sup> Results obtained in simple, unbureaucratic surveys are currently presented to the medical profession and policy makers but also a wide range of media outlets in the quest of finding widespread recognition for COVID long-haul symptoms and fast working remedies.<sup>235</sup> These COVID long haul forums often expand the range of healing methods to more holistic and alternative remedies.

This tendency toward bottom-up information gathering is a form of crowdsourcing of information on COVID-19 and its unforeseen long-term consequences. These introspective observer positions of self-determined patients sometimes appear in a more informed position than the medical sector. Their remaining online not only lifts pressure from currently overwhelmed medical personnel in hospitals. In their fast and unbureaucratic exchange and in their role as informants to government officials responsible for health and well-being, Long Haulers have become a self-determined and highly engaged crowd information source for fast problem-solving that can relieve the general health system. This trend captures a newly developing online democratization of healthcare information.

### 3. *Alternative Medicine and Ecowellness Trends for Prevention*

The rise in medical self-help online and mutual support will have profound implications for the regulation of the medical profession. COVID Long Haulers tend to stretch cure options for alternative medicine solutions that rebalance their stressed immune systems. In online forums and digitalized exchange, Long Haulers guide a holistic, democratic expansion of the repertoire for healing and prevention.<sup>236</sup> The widening of discussion forums about the social representations of COVID-19 symptoms could instigate a transformation of the health system.

Alternative remedies that can restore balance and a natural immune system reset but also harmony with the environment have already been identified as possible cures for Long COVID. Acupuncture, intermittent and therapeutic fasting, herbal alternatives and dietary supplements – such as yogurts for pre- and pro-biotics – but also yoga and meditation are already booming trends in COVID long-haul online internet forums.<sup>237</sup> These easily understood alternative means

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234. *Interdisciplinary, Multimedia Conference, supra* note 12.

235. *Id.*

236. *Id.*

237. LAUREN BERLANT, *CRUEL OPTIMISM* (2011); *see also* Jürgen Vormann, *Magnesium: Nutrition and Homeostasis*, 24 *MOLECULAR ASPECTS MED.* 27 (2003); Lucy Chen & Andreas Michalsen, *Management of Chronic Pain Using Complementary and Integrative Medicine*, 357 *BRIT. MED. J.* 1284 (2017); Puaschunder, *supra* note 222; Kuno Hottenrott et al., *Exercise Training, Intermittent Fasting and Alkaline Supplementation as an Effective Strategy for Body Weight Loss: A 12-Week Placebo-Controlled Double-Blind Intervention with Overweight Subjects*, 10 *LIFE* 74 (2020).

that also include foresighted prevention, nutrition supplements and a healthy anti-inflammatory diet are rooted in different incentive mechanisms compared to those set by the pharmaceutical market. For instance, fasting as abstaining from food is often sidelined in the range of options presented to patients. While the reasons for this remain opaque, one can only speculate about the economic incentives of the food and pharmaceutical industry. Reducing one's calorie intake has a different economic impact than a break-through medication that can have extraordinarily high sales margin, as pharmaceuticals are typically on top of the price mark-up range per industry. A healthy diet, yet, also has a lower carbon footprint than the marketing of new drugs, which often require chemicals and trials that may end up as non-excludable debris in the drinking water. Dieting may also have less unexpected externalities and risks if done with caution than new drug trials. The lobbying of the pharmaceutical industry and the incentives sometimes set by professional groups may influence the opinion of medical professionals. Discussing fast remedies online with similarly affected patients, portrays the information sharing among fellow COVID Long Haulers more innocently and certainly filled with more empathy for fellow sufferers. In the end, COVID Long Haulers are undergoing a shared struggle that is not well understood and sometimes not recognized by professionals as such yet. Because long-term COVID sufferers are often rather young, long-term medication would not only cause the known side effects, such as collateral organ damage, but also possible psycho-social consequences such as stigmatization and psychological trauma of despair and misunderstanding by the medical profession. Alternative medicine and information exchange online appears as an at least considerable option.

The projected growing number of chronically long-term disabled COVID Long Haulers and those with autoimmune system imbalances increases the importance and value of preventive medicine with a long-term impact. Alternative remedies offer the potential to reset the immune system and create harmony with the environment. Preventive and alternative medicine are inclusive alternatives that also integrate the big picture of external environmental conditions. Chronic diseases and their therapy can be treated most successfully if the diverse and changing spectrum of health and disease is understood from the point of view of systems biology and with regard to the natural and social environment as a source of calming factors or stressors. Big data gathering and crowdsourcing of information enables to integration of a wide-range data in exploratory analysis to understand systems change avenues. Holistic process-oriented systems also integrate traditional healing methods as well as the humanities, psychosomatics, spirituality, and art.<sup>238</sup>

The longer the COVID pandemic endures, and the deeper the long-haul crisis runs through society, the more alternative solutions shared online are expected to gain ground in the overall spectrum of remedies available to Long Haulers. The rise in medical self-help and mutual support will have profound implications for the regulation of the medical profession and will likely boost alternative medicine

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238. *Interdisciplinary, Multimedia Conference, supra* note 12.

and over-the-counter remedies. Implicit monopolization of pharmaceutical markets and biased subscription regimes may become harder when access to healthcare information and medication remedy but also drug performance and side effects become more transparent in crowdsourcing of information on drugs in the digital age.

In the future, COVID Long Haulers may shift focus from seeking treatment in emergency situations toward prevention. As Long Haulers face recurrent flare-up episodes of symptoms, they will naturally develop an appreciation for foresighted medical care, hence prevention. We already now experience a trend of COVID Long Haulers being extraordinarily cautious and anxious about getting sick again. Promoting prevention and general healthcare in the future in a more decentralized way will likely shift the political economy power dynamics between patients and doctors but also the healthcare framework surrounding medical care. Self-determined information exchange about prevention may ennoble humans with feelings of internal self-control. Long-haul patients as experts of their own emerging disease, demand to become patients as partners within the medical care.<sup>239</sup> A more egalitarian access to preventive health rather than finding oneself debilitated and confronted in an emergency care hierarchy dependent on life-saving support of doctors can build a more informed, rational, and strategic decision-making path.<sup>240</sup> Preventive protection and general salutogenesis will become features of success for individual lives, families, corporations and whole societies of the future, who may have a more egalitarian access to health and well-being as a common good through online access to medical information.<sup>241</sup>

#### 4. *Ethical Predicaments in the Democratization of Healthcare Information Online*

In the current formation of ethical standards for Artificial Intelligence and big data, these novel technologies and the insights derived from them offer enormous benefits for society. At the same time, ethical predicaments arise out of the use of these novel technologies that potentially infringe on laws and human beings and impose risks to societal welfare.<sup>242</sup>

A stakeholder survey conducted in November 2019 revealed that perceived risks in the use of big data in healthcare include data misuse and leakage leading to privacy infringements, as well as biases and errors. Big data insights open gates for differential health care pricing, stigmatization, social stratification,

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239. Harvard T.H. Chan School of Public Health, *Understanding Long COVID: The Unseen Public Health Crisis*, YOUTUBE (Nov. 19, 2021), <https://www.youtube.com/watch?v=5sjiXbvK-Ow> [<https://perma.cc/E2XT-K8TN>].

240. JULIA PUASCHUNDER, BEHAVIORAL ECONOMICS AND FINANCE LEADERSHIP: NUDGING AND WINKING TO MAKE BETTER CHOICES (2020).

241. *Interdisciplinary, Multimedia Conference, supra* note 12.

242. See Jamie Harris & Jacy Reese Anthis, *The Moral Consideration of Artificial Entities: A Literature Review*, 53 SCI. & ENG'G ETHICS 1 (2021).

discrimination, and market manipulation.<sup>243</sup> While big data mining companies are still developing their role in the healthcare industry and seek to extend their market reach, the biggest leaders in the field are still facing an uphill battle, with – for instance – Google recently closing its own health division.<sup>244</sup>

The downsides of crowdsourcing information about health online are novel emerging potential liability risks and unknown legal as well as ethical boundaries. International big data exchange could set standards for future pandemic prevention but should also provide big data privacy protection and legal anti-discrimination means against misuse of sensitive information that leads to stigmatization of vulnerable patients' exposure of their conditions. Instant online exchange of sensitive information about one's health status makes citizen scientists particularly vulnerable in terms of their privacy and potentially susceptible to online marketing campaigns under medically impaired conditions. But also the long-term impact of publicly disclosed sensitive information that is shared bit-by-bit online over time appears sensitive and not foreseen in humans, especially likely in the impaired.<sup>245</sup> In the digital age, it is difficult to estimate what effects the piecemeal sharing of private information will have over time, when, for example, personal health information disseminated in an internet forum is absorbed into large datasets. If information is analyzed and displayed in relation to other individuals' performance, a combined dataset could open gates for discrimination and stigmatization.

The anonymous participation in new virtual realities currently also brings along completely new problems such as cyber-crime, hate postings and social censorship by online mobs, which could be particularly harmful to vulnerable patients seeking remedies online. Governments and traditional media have lost control over the public opinion formation in the digital age. Legal protection includes privacy in "big data" and the individual "right to be forgotten" online as well as the dignity of conscientious data protection and online privacy protection.<sup>246</sup> Healthy and informed access to new media needs to address the

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243. Puaschunder & Gelter, *supra* note 208.

244. Ruth Reader, *With a Wearable Reportedly in the Works, Facebook Continues a Quiet Push into Health*, FAST CO. (Feb. 19, 2021), <https://www.fastcompany.com/90606044/facebook-health-tracker-wearable> [<https://perma.cc/NXA4-JPMG>]; Paddy Padmanabhan, *Is Healthcare Too Hard for Big Tech Firms?*, HEALTHCARE IT NEWS (Aug. 23, 2021, 3:23 PM), <https://www.healthcareitnews.com/blog/healthcare-too-hard-big-tech-firms> [<https://perma.cc/95R8-2TN2>]; Donna Cusano, *Breaking: Google Health Shutting Down, Most Employees Scattered to Other Divisions (Updated)*, TELEHEALTH & TELE CARE AWARE (Aug. 21, 2021), <https://telecareaware.com/breaking-google-health-shutting-down-most-employees-scattered-to-other-divisions/> [<https://perma.cc/SD4S-FF8R>].

245. See Julia M. Puaschunder, *Data Fiduciary in Order to Alleviate Principal-Agent Problems in the Artificial Big Data Age*, 46TH E. ECON. ASS'N CONF. 1 (2019).

246. Julia M. Puaschunder, *The Nudging Divide in the Digital Big Data Era*, 4 INT'L J. RES. BUS., ECON. & MGMT. 49, 49 (2017); see also Effy Vayena et al., *Machine Learning in Medicine: Addressing Ethical Challenges*, 15 PUB. LIBR. SCI. MED. 1 (2018) (discussing privacy issues regarding the use of machine learning on medical data).

dilemma between the individual benefit from information exchange online versus the human dignity of privacy on the internet.<sup>247</sup>

On a wider societal scale, the digitalization disruption also brings along novel inequalities.<sup>248</sup> Inequality in internet connectivity, tech skills and affinity to digitalization leverages Artificial Intelligence-human-compatibility as a competitive advantage. Digital online working conditions that make individual living conditions transparent emphasize social hierarchies in our work-related interactions and may further transpire differences in social status in business and educational settings.

New approaches to teaching and learning have highlighted novel inequalities – such as disparities in the private spaces and access to digitalization benefits as well as internet infrastructures and favorable time zones. As access to healthcare and education have become pegged to virtual experiences, we need to rethink the democratization of internet access and online availability. Inequality divides opening - based on the online access and technology affinity determining the availability of health care, education and emotional well-being - should become subject to policy intervention in order to avert societal downfalls that leave behind welfare potential in education and learning. Taxing internet generated gains could provide the fiscal space to offset online inequalities in granting access, tools and capabilities for underprivileged segments and train COVID long-hauling in conscientiously using new technologies.<sup>249</sup>

##### 5. *Online Education Prospects*

COVID-19 revolutionized the education sector for digital learning and hybrid online solutions.<sup>250</sup> With COVID-19 requiring social distancing and Long COVID being a potential debilitation disability for younger population groups, education professionals had to rethink learning operations, teaching methods, and examination standards.<sup>251</sup> With most university campuses around the world undergoing a speedy transition to online teaching and remote learning during the pandemic,<sup>252</sup> it has become a certainty that hybrid learning and online classwork can be longer-lasting advantages that may also hold innovation potential to alleviate inequality. Especially with information rising about the long-term

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247. See Julia M. Pauschunder, *Dignity and Utility of Privacy and Information Sharing in the Digital Big Data Age*, 5 INT'L J. COMM. & MGMT. RSCH. 62 (2018).

248. Andrea Korte, *New Report Calls for Input from Underserved Communities in Deploying AI for Public Health*, AM. ASS'N FOR ADVANCEMENT SCI. (Sept. 14, 2021), <https://www.aaas.org/news/new-report-calls-input-underserved-communities-deploying-ai-public-health> [<https://perma.cc/C6ZS-QQCE>].

249. Pauschunder, *supra* note 246; Pauschunder, *supra* note 148; see also Julia M. Pauschunder, *Revising Growth Theory in the Artificial Age: Putty and Clay Labor*, 8 ARCH. BUS. RSCH. 65 (2020).

250. Corlatean, *supra* note 212.

251. *Id.*

252. Walsh, *supra* note 160.

impact of COVID-19 and variants spreading that are harder on younger populations, education will likely stay – at least in parts – socially distanced.

For the education world, the devastating pandemic also brought along enormous innovation, flexibility, and inequality alleviation potential: Disruptive technology use adopted in record speed during the pandemic will enable universities in the future to cater education to the whole world at low cost. Online learning offers students flexibility without considering their location or timeframe to study in a particular country if no relocation or visa to enter the country to study is required. Generation COVID-19 Lockdown and Long-Haulers now will likely continuously put pressure on universities to offer hybrid education in larger international network consortia. Students from all over the world could thereby flexibly take courses in large international education hubs with participating institutions being far spread out around the world. The actual on-site work of universities and research institutions will likely be focused on research, while learning will more likely happen online in the virtual space. Networks that allow sharing resources within a larger consortium of universities around the world and within different industries or governments will likely take over. Virtual meetings will provide the luxury of guest speakers granting a truly international outlook.

Digitalization disruption may also become a vehicle for upward social mobility that opens access to elite education without the need for a visa and the financial means for relocation and housing. Without these costs, students will also be free to study longer and put together more diverse curricula over time and across institutions. Education of the future could thus become truly global, tailored to individual interests and needs, life-long and catered to current developments. Online education can thereby become the great equalizer that international development has been searching for decades.<sup>253</sup> Future partnerships of the technology sector and universities could extend the spectrum of hybrid teaching in international educational consortia. Global access to online education could become an international development transformation game changer.

With the currently ongoing digitalization disruption requiring increasingly e-skills and the labor market has become truly global in the digital economy, the time for sophisticated and individualized e-education appears to have come.<sup>254</sup> Access to virtual consortia will enable students to cherry-pick a personalized curriculum based on interests and independent from the physical locations. A new cadre of individualized and highly-specialized graduates could emerge after the pandemic that could select catered studies based on their needs and wants during different stages of their careers. For this model to work, institutional openness to collaborate on a truly global level has to be emphasized.

The online teaching option will likely lead to market segmentation between high-end physical learning experiences and low-cost online experiences. The division between these categories will likely depend on the field of study.

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253. Corey Robin, *The Pandemic is the Time to Resurrect the Public University*, NEW YORKER (May 7, 2020), <https://www.newyorker.com/culture/cultural-comment/the-pandemic-is-the-time-to-resurrect-the-public-university> [<https://perma.cc/43HM-2CK9>].

254. Jones & Romer, *supra* note 210.

Bundling options could couple hybrid short-term physical learning with online learning.<sup>255</sup>

With COVID Long Haulers sometimes experiencing waves of symptoms and/or chronic fatigue, our understanding of learning and testing at one moment in time will also have to give way to more flexible, mellow schemes of productivity and success.<sup>256</sup> To cater and adjust to COVID Long Haulers, the universities of tomorrow will have to find curricula and evaluation criteria to adjust for weaknesses, rest, recovery, and mental impediments lingering after an infection. Disability awareness and compassion will become key elements and qualifications of future successful educational institutions, but also essential social skills one can pick up in flexible learning and testing schemes as a necessary future social skill for a future fruitful career.

While the affordability of entering virtual educational spaces could become great equalizer through affordable education around the globe. At the same time, too many students acquiring degrees could lead to an education boom and degree inflation. This may lead – in the long run – to a discreditation of already-existing degrees or at least a two-tier system, in which some gained a real-world education and others fully virtual ones. Online education must define the highest quality standards and monitoring control to compensate for the missing real in-person learning and on-campus networking.

If students do not need to be physically present on campuses and given the COVID long-haul risk, young adults may likely stay longer with their parents. A generation that can miss campus experiences may grow up with a different mindset than those who spent time around people of their own age. It may not be a bad thing to stay longer under the protection of older generations, as children of older parents have a propensity to be successful in educational settings and career-wise. But with Generation Lockdown, there is the risk of social isolation, heightened levels of depression and a generation scared of social contact in contrast to students who have had the real-world learning experience. Lowering the cost of education also holds the potential to lift the educational debt that puts generation internship into a prison of debt from which they often cannot escape even long after graduation. Virtual learning experiences may also free students from social-psychological burdens and problems created by peer pressure in an on-campus educational environment. Introvert people are expected to actually benefit from virtual settings. In order to take advantage and seize the opportunity of online learning world, but also to avoid problems arising from virtual realities, society together may work towards flourishing virtual spaces that uphold a healthy online exchange grounded in mutual respect. Ennobling learning ethics of inclusion will embrace diversity. Overall, virtual online education offers to imbue more social upward mobility into education. Digitalization holds the key to granting access to affordable education in all corners of the world and can

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255. Karen Feldscher, *COVID's Future: From Pandemic to Endemic?*, HARVARD GAZETTE (Aug. 12, 2021), <https://news.harvard.edu/gazette/story/2021/08/what-will-it-be-like-when-covid-19-becomes-endemic/> [<https://perma.cc/LZU5-XFEQ>].

256. *Id.*

become the long-awaited-for means to convey the spirit of hope inequality on a global scale.

### *C. Social, Healthcare and Retirement Reform*

#### *1. Recognition of Long-Haul COVID as a Disability*

Since the outbreak of COVID-19, COVID Long-Haul awareness has been growing steadily. In July 2021, U.S. President Joseph Biden and Vice President Kamala Harris announced that some impaired Long Haulers would be recognized as disabled.<sup>257</sup> In speedy response to the Long COVID pandemic, the United States Office for Civil Rights of the Department of Health and Human Services in cooperation with the Civil Rights Division of the Department of Justice have put forward guidance on Long COVID as a disability.<sup>258</sup> Joint guidance from the United States Departments of Health and Human Services and Justice acknowledges that long COVID can be considered a disability under the Americans with Disabilities Act. Long COVID is also recognized as disability in regards to the anti-discrimination provisions in the Rehabilitation Act and the Affordable Care Act.<sup>259</sup>

As the U.S. Department of Health & Human Services (“HHS”) explains, long COVID can be recognized as a disability under Titles II (state and local government) and III (public accommodations) of the Americans with Disabilities Act (“ADA”).<sup>260</sup> In addition, Section 504 of the Rehabilitation Act of 1973,<sup>261</sup> and Section 1557 of the Patient Protection and Affordable Care Act apply.<sup>262</sup> Each of these federal laws is intended to protect individuals with disabilities from discrimination.<sup>263</sup> These mandatory protections apply even during emergencies and cannot be waived.<sup>264</sup>

According to the HHS, Long COVID can be considered as a disability under the sections listed above if an impairment following an infection substantially

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257. Rubin, *supra* note 8; Press Release, President Joe Biden, *supra* note 54; Cirruzzo, *supra* note 54.

258. *Guidance on “Long COVID” as a Disability Under the ADA, Section 504, and Section 1557*, U.S. DEP’T HEALTH & HUM. SERV., <https://www.hhs.gov/civil-rights/for-providers/civil-rights-covid19/guidance-long-covid-disability/index.html> [HTTPS://PERMA.CC/QH9D-QTRB] (LAST UPDATED JULY 26, 2021).

259. Lydia Wheeler, *Long Covid’s Catch-22: Too Sick to Work, Yet Not Quite Disabled*, BLOOMBERG L. (Nov. 18, 2021, 4:00 AM), <https://news.bloomberglaw.com/health-law-and-business/long-covids-catch-22-too-sick-to-work-yet-not-quite-disabled> [https://perma.cc/H568-9LJ3].

260. *Guidance on “Long COVID” as a Disability*, *supra* note 258; 42 U.S.C. §§ 12101-12103, 12131-12189.

261. 29 U.S.C. § 794.

262. 42 U.S.C. § 18116.

263. *Guidance on “Long COVID” as a Disability*, *supra* note 258.

264. *Id.*

limits one or more major life activities. Moreover, individuals with a record of such an impairment and persons regarded as having such an impairment also qualify as disabled.<sup>265</sup> Relevant major life activities include (but are not limited to)

“caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, sitting, reaching, lifting, bending, speaking, breathing, learning, reading, concentrating, thinking, writing, communicating, interacting with others, and working. The term also includes the operation of a major bodily function, such as the functions of the immune system, cardiovascular system, neurological system, circulatory system, or the operation of an organ.”<sup>266</sup>

The HHS further advises that

“[t]he term “substantially limits” is construed broadly under these laws and should not demand extensive analysis. The impairment does not need to prevent or significantly restrict an individual from performing a major life activity, and the limitations do not need to be severe, permanent, or long-term. Whether an individual with long COVID is substantially limited in a major bodily function or other major life activity is determined without the benefit of any medication, treatment, or other measures used by the individual to lessen or compensate for symptoms. Even if the impairment comes and goes, it is considered a disability if it would substantially limit a major life activity when the impairment is active.”<sup>267</sup>

COVID-19 Long Haulers are therefore “entitled to full and equal opportunities to participate in and enjoy all aspects of civic and commercial life.”<sup>268</sup> This implies that businesses, state or local governments will have to “operate to accommodate a person’s long COVID-related limitations.”<sup>269</sup> “For people whose long COVID qualifies as a disability, these changes, or ‘reasonable modifications,’ may include” access to goods and services, flexible timing and adjusted testing as well as granted assistance by human, animal, device and technology.<sup>270</sup>

The HHS guidance addresses only the definition of disability under these laws.<sup>271</sup> The recently-issued guidelines do not fully “cover other definitions of disability or eligibility requirements such as those necessary to qualify for Federal

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265. *Id. See, e.g.*, 42 U.S.C. § 12102(1); 29 U.S.C. § 705(9)(B), (20)(B); 28 C.F.R. §§ 35.108, 36.105; 45 C.F.R. § 92.102(c).

266. *Id.*

267. *Id.*

268. *Id.*

269. *Id.*

270. *Id.*

271. *Id.*, n.9.

benefit programs under Social Security.”<sup>272</sup> The full legal status and policy guidelines on long COVID are currently formed and expected to be adjusted and fortified as society learns more about COVID-19 and its long-term effect on human health, well-being and productivity.

To qualify for Social Security disability insurance, a condition must meet the agency’s definition of a disability.<sup>273</sup> Under the SSA’s rules, the disabling condition or symptoms also have to have lasted, or be expected to last, for a year or result in death.<sup>274</sup> A person who has limitations resulting from long Covid and meets or is expected to meet the duration requirement, “could be found disabled if their limitations equal a medical listing or if the combination of those limitations and vocational factors prevent them from performing substantial gainful activity.”<sup>275</sup>

Already now, literature emerges that claims that some of the COVID long haul conditions are hard to prove, and insurers can still set limits on benefits awarded to disabled COVID Long Haulers.<sup>276</sup> Protection from discrimination and the provision of public accommodations thus still leave many too sick to work without secured financial disability protection.<sup>277</sup> To this day, Long COVID is not on the Social Security Administration’s list of disabling medical conditions.<sup>278</sup> So far, the nation’s biggest private long-term disability insurers also tend not to acknowledge that long COVID can cause long-term disability.<sup>279</sup> It appears problematic that some of the most debilitating symptoms or the infection are still hard to prove and there needs to be an associated functional limitation that impacts the ability to do a particular job or work in general.<sup>280</sup> General problems are the relatively low acceptance rate of Social Security disability benefits claims – on average 66% of the claims were denied in the period between 2009 and 2018.<sup>281</sup> It can also take three to five months on average for the Social Security Administration to make a decision about pending claims.<sup>282</sup> In addition, even if successful, the social security benefits are in general often economically ‘sticky,’ meaning too slowly valorized to adjust to inflation.

In 2020, as the pandemic took hold, U.S. health insurance companies declared they would cover 100% of the costs for COVID treatment, waiving copays and expensive deductibles for hospital stays that frequently range into the hundreds of thousands of dollars.<sup>283</sup> But then in 2021, insurers have already

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272. *Id.*, n.9.

273. Wheeler, *supra* note 259.

274. *Id.*

275. *Id.*

276. *Id.*

277. *Id.*

278. *Id.*

279. *Id.*

280. *Id.*

281. *Id.*

282. *Id.*

283. Christopher Rowland, *The Days of Full COVID Coverage Are Over. Insurers Are*

started to cancel full COVID care coverage during sickness and restore deductibles and copays that leave acute COVID patients with enormous medical bills.<sup>284</sup> So while large insurance companies waived cost-sharing for Coronavirus care in 2020, it has sprung back in 2021 with most insurers having reinstated copays and deductibles for COVID patients, in many cases even before vaccines became widely available.<sup>285</sup> Not only is the time of infection an inequality driver, there is also a lack of uniformity in COVID insurance practices between insurers and regions, which opens an uneven burden between patients across the country, varying widely by healthcare plan and geography.<sup>286</sup> According to The Washington Post, patients in the same hospitals and in the same ICU units could be facing completely different financial burdens.<sup>287</sup> With no federal mandate for insurers to cover all the costs for COVID treatment, it remains at the discretion of insurers how much they support COVID patients and Long Haulers.<sup>288</sup> And the reintroduction of cost-sharing mainly affects people with private or employer-based insurance.<sup>289</sup> Private insurance coverage for COVID Long Haulers is also insofar unstable as it can be approved at first but later cut off.<sup>290</sup> Documentation is also often hard to obtain in an overflowing healthcare system and long waiting periods for poorly understood long haul issues. With reference to historical precedents of the past, Generation COVID Long-Haul partially being recognized as a disabled group may result in increased spending pressures and reform needs of the social, healthcare and retirement systems on a large scale.

## 2. *Impact on Retirement Systems and Financial Markets: Historical Parallels*

When considering the relatively young age of the onset long-haul COVID-19, which is currently estimated to be most likely during the ages of thirty to fifty with a peak around the early to mid-forties, the long-term impetus of this usually highly productive part of society being slowed and/or weakened will be substantial when considering the dimensions of widespread infections if COVID turns endemic and the expected tax revenue from this age group's working income over time.<sup>291</sup> The fact that a significant proportion of the population will

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*Restoring Deductibles and Copays, Leaving Patients with Big Bills*, WASH. POST, <https://www.seattletimes.com/nation-world/nation/the-days-of-full-covid-coverage-are-over-insurers-are-restoring-deductibles-and-copays-leaving-patients-with-big-bills/> [https://perma.cc/M45X-3KB2] (last updated Sept. 22, 2021).

284. *Id.*

285. *Id.*

286. *Id.*

287. *Id.*

288. *Id.*

289. *Id.*

290. Wheeler, *supra* note 259.

291. Davis et al., *supra* note 47; Ed Yong, *Long-Haulers Are Redefining COVID-19*, ATLANTIC (Aug. 19, 2020), <https://www.theatlantic.com/health/archive/2020/08/long-haulers->

become Long Haulers and thus be inhibited in their labor force participation will very likely lead to a significant impact on social systems, especially retirement systems, and consequently financial markets.

As an analogy for the current situation, there are historical precedents in the first half of the 20<sup>th</sup> Century after World War II, when social benefits and retirement schemes changed drastically in post-war European social democracies. Since the outbreak of the Coronavirus comparisons have been made to ‘war economies.’<sup>292</sup> It was during the post-World War era that the funding schemes for the current social and pension system were set on a course in many war-struck countries in Europe that lasts until today.

There are essentially two models for retirement systems (regardless of whether they are public or private), namely the funded model and the pay-as-you-go (“PAYGO”) model. Under the funded model, retirement savings are set aside for the future and typically invested in the capital market.<sup>293</sup> In the PAYGO model, funds are paid out to beneficiaries at the same time as they are collected from the contributions of current workers. A key advantage of the PAYGO systems – at least from the short-term political perspective – is that funds are immediately available to meet urgent demands of populations, especially after crises or when there is an unexpected surge of population segments being in pressing need for welfare insurance payments.

Continental European countries – such as Germany and France, to give two examples – historically introduced their retirement systems mainly as *funded* systems that would rely on savings dedicated to retirement. In the German pension system, which was set up in 1889, the funding principle never worked for extended periods. Reasons for the failure of the funded system include World

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covid-19-recognition-support-groups-symptoms/615382/ [https://perma.cc/34PK-7S8Z]; Francis Collins, *Breakthrough Infections in Vaccinated People Less Likely to Cause ‘Long COVID’*, (Sept. 14, 2021), NAT’L INST. HEALTH DIRECTOR’S BLOG, <https://directorsblog.nih.gov/tag/long-haulers/> [https://perma.cc/KM3J-MQXT]; Doheny, *supra* note 44.

292. John Cassidy, *The Coronavirus Calls for Wartime Economic Thinking*, NEW YORKER (Mar. 16, 2020), <https://www.newyorker.com/news/our-columnists/the-coronavirus-calls-for-wartime-economic-thinking> [https://perma.cc/E5EQ-G8ZK]; Daniel Susskind, *The Pandemic’s Economic Lessons*, ATLANTIC (Apr. 6, 2020), <https://www.theatlantic.com/international/archive/2020/04/lessons-wartime-economics-coronavirus-covid19/609439> [https://perma.cc/P7HF-S8VQ] (discussing the analogy to the war economy and the strong interference of the government with private contracts, e.g. with the UK government effectively “underwriting almost the entire private sector through wage guarantees”); Gary Pinkus & Sree Ramaswamy, *The ‘War’ on COVID-19: What Real Wars Do (and Don’t) Teach Us About the Economic Impact of the Pandemic*, MCKINSEY & CO. (May 14, 2020), <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-war-on-covid-19-what-real-wars-do-and-dont-teach-us-about-the-economic-impact-of-the-pandemic#> [https://perma.cc/QFR4-NBQR].

293. Funded systems could be organized as a “defined benefit” systems, where the investment risk is borne by the system provider (e.g., an employer), or as “defined contribution” systems, where the investment risk is borne by the beneficiary (the employee and future retiree), who may be able to direct the funds in her personal account to specific investments.

War I reparation payments after the Treaty of Versailles in 1919, the destruction of the capital stock by hyperinflation in the 1920s,<sup>294</sup> the use of pension assets for public expenditures (especially by the Nazis), and the damage inflicted on the German economy by World War II.<sup>295</sup> The 1957 West German reform transformed retirement into a comprehensive social benefit system that provided 60% of a retiree's previous monthly income.<sup>296</sup> Thus, it reduced reliance on other financial sources, such as support from the family.<sup>297</sup>

A major reason for this transition of social welfare funding was that inflation had greatly diminished the value of private savings.<sup>298</sup> Moreover, the funded system was converted into a PAYGO system<sup>299</sup> over objections, among others, from the financial industry.<sup>300</sup> With the change of systems, pensions now came primarily from the contributions of current workers instead from a funded capital stock.<sup>301</sup> This was politically advantageous because it allowed payouts to uninsured older workers and a substantial amount of refugees from Eastern

294. See Peter Ahrend, *Pension Financial Security in Germany*, in SECURING EMP.-BASED PENSIONS 73, 75 (Zvi Bodie, Olivia S. Mitchell & John A. Turner eds. 1996) (discussing how hyperinflation made retirement benefits important for employees because private savings were wiped out).

295. Bert Rürup, *The German Pension System: Status Quo and Reform Options*, in SOC. SEC. PENSION REFORM EUR. 137, 137 (Martin Feldstein & Horst Siebert eds. 2002); Gordon L. Clark, *Private Pensions as Partial Substitute for Public Pensions in Germany*, in PENSION SEC. 21<sup>ST</sup> CENTURY 115, 115 (Gordon L. Clark & Noel Whiteside eds. 2003); see also Peter A. Köhler, *Entwicklungslinien der 100jährigen Geschichte der gesetzlichen Rentenversicherung: Die Zeit von 1891-1957*, in HANDBUCH DER GESETZLICHEN RENTENVERSICHERUNG 51, 83 (Franz Ruland ed. 1990) (noting that the German retirement insurance system's capital had been destroyed three times in 30 years in 1945). It has been suggested that the German system already had become a de facto PAYGO system because most of its assets were invested in German government bonds during the interwar period. Axel Boersch-Supan & Christina B. Wilke, *The German Public Pension System: How it Was, How it Will Be*, NAT. BUREAU ECON. RSCH. 1, 4 (2004).

296. Bernhard Ebbinghaus et al., *Germany: Departing from Bismarckian Public Pensions*, in VARIETIES PENSION GOVERNANCE: PENSION PRIVATIZATION EUR. 119, 125 (Bernhard Ebbinghaus ed. 2011).

297. Hans Günter Hockerts, *Sozialpolitische Reformbestrebungen in der Frühen Bundesrepublik*, 25 VIERTELJAHRESHEFTE FÜR ZEITGESCHICHTE 541, 562 (1977).

298. Jens Alber, *Germany*, in 2 GROWTH TO LIMITS 3, 23 (Peter Flora ed. 1986).

299. E.g., Bernhard Ebbinghaus, *The Changing Public-Private Pension Mix in Europe: From Path Dependence to Path Departure*, in VARIETIES PENSION GOVERNANCE 23, 35 (Bernhard Ebbinghaus ed. 2011).

300. Hans Günther Hockerts, *Entwicklungslinien der 100jährigen Geschichte der gesetzlichen Rentenversicherung*, in HANDBUCH DER GESETZLICHEN RENTENVERSICHERUNG 93, 99 (Franz Ruland ed. 1990) (noting that banks and insurance companies felt strongly threatened); Alber, *supra* note 298, at 106 (discussing opposition by liberals and banks).

301. Ebbinghaus et al., *supra* note 296, at 125; see also Boersch-Supan & Wilke, *supra* note 295, at 4.

Europe.<sup>302</sup> A major concern was that the new system would obliterate the need for private savings and may even make them impossible because of higher deductions, and because there would no longer be any retirement wealth that needs to be invested.<sup>303</sup> The reform may have helped prevent the emergence of a strong capital market in Germany, given that funds were no longer available for occupational pension commitments.<sup>304</sup>

Similarly, the funded French system ran into problems in the late 1930s because many new retirees did not have enough funds in their accounts to cover the minimum guaranteed pension.<sup>305</sup> A proposal by the government was to reduce allocations to individual accounts in order to be able to pay the amount directly to current retirees.<sup>306</sup> Inflation and the economic crisis eroded the 1930 system's funding basis, and the German invasion struck the final blow to funding.<sup>307</sup> The Vichy regime came to see the system as financially unviable<sup>308</sup> and introduced the PAYGO system in 1941.<sup>309</sup> Besides the failure of the funded capital stock, the motivation for introducing the new system was, as in the subsequent German 1957 reform, the inclusion of workers who had not made significant contributions to pension accounts.<sup>310</sup> The switch to PAYGO allowed the use of accumulated reserves to pay pensions to old workers.<sup>311</sup> Reforms after 1945 consolidated the

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302. Ebbinghaus et al., *supra* note 296. Politically, it apparently also helped to keep West Germany attractive as a target for East Germans considering a defection to the West. *See* Hockerts, *supra* note 297, at 571 (quoting Chancellor Konrad Adenauer that "the Federal Republic should remain attractive for inhabitants of 'the zone'").

303. Hockerts, *supra* note 300, at 100.

304. *See* Markus Roth, *Private Pensions and Corporate Governance*, SOC. SCI. RSCH. NETWORK 1 (2012).

305. *See* Anne Reimat, *Histoire Quantitative de la Prise en Charge de la Vieillesse en France XIX<sup>e</sup> – XX<sup>e</sup> Siècles: Les Régimes de Retraites*, 35 *ÉCONOMIES ET SOCIÉTÉS* 1097, 1157 (2001) (explaining that, in the 1910s and 1920s, the funding principle applied to the contributions, while expenses were financed by the state).

306. F. Netter, *Les Retraites en France au Cours de la Période 1895-1945 (fin)*, 1965 *DROIT SOCIAL* 514, 517 (1986).

307. YVES BOUTHILLIER, 2 *LE DRAME DE VICHY* 364 (1951) ("The war, the occupation and the loss of value of the Franc in comparison to the Mark led us rapidly but fatally to a monetary devaluation . . . The devaluation of 1936 should already have provoked the disappearance of the system.").

308. *Id.* at 364 (former Vichy finance minister criticizing the funded pension system in his memoir); Marek Naczyk & Bruno Palier, *France: Promoting Funded Pensions in Bismarckian Corporatism?*, in *VARIETIES PENSION GOVERNANCE* 89, 96 (Bernhard Ebbinghaus ed. 2011) (discussing the failure of the system).

309. Loi du 14 mars 1941 relative à l'allocation aux vieux travailleurs salariés.

310. Reimat, *supra* note 305, at 1178 (attributing the general trend toward PAYGO in various parts of the French pension system to the inclusion of workers without a significant contribution history).

311. BOUTHILLIER, *supra* note 307, at 364-365; *see also* PAUL V. DUTTON, *ORIGINS OF THE FRENCH WELFARE STATE: THE STRUGGLE FOR SOCIAL REFORM IN FRANCE* 203-04 (2002)

PAYGO system,<sup>312</sup> and prior bad experience with a funded system added to its subsequent popularity.<sup>313</sup>

In the middle of the 20<sup>th</sup> Century, urgent needs of various crisis-struck population groups compelled both countries to convert their retirement system into PAYGO. Politically significant groups and a large body of young voters had to be met, including relatively young war veterans, those impoverished after industry and economic shocks, stock market crashes and wars.

Across countries, the nature of these PAYGO systems meant that relatively few private funds were available for investment in capital markets. Stock markets remained small throughout the second half of the 20<sup>th</sup> Century, and firms financed themselves mainly internally through growth or bank loans where external finance was needed. Research in political science, law, and finance shows that PAYGO systems have small capital markets and concentrated ownership structures.<sup>314</sup>

Generation COVID Long-Haul could have a similar impact on financial systems. The longer COVID-19 persists and society is figuring out remedies to avoid, mitigate and adapt to the disease, the more people will classify for COVID Long Haulers and the more pressure to provide substantial assistance and integration in society for them will mount. If a significant proportion of the productive population is unable to work, political pressure to find funding to provide a decent standard of living for these groups will invariably develop. Organized interest groups of COVID Long Haulers will arise, and this time social online media will likely play a significant role. The COVID long-haul cohort spans different socio-economic groups, which means that large proportions of the electorate with different social backgrounds will likely sympathize with their plight.

Long Haulers are typically relatively young and at an age where they will

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(discussing the Vichy regime's possible intent to gain the support of the working class).

312. Ordonnance du 30 décembre 1944, Ordonnance du 4 octobre 1945, Ordonnance du 19 octobre 1945.

313. ANNE-MARIE GUILLEMARD, AGING AND THE WELFARE-STATE CRISIS 53, 65 (2000) (quoting a supporter of the PAYGO as saying “[i]t is therefore absolutely vital to replace this system with a pay-as-you-go plan that allows the real resources to be shared constantly among all members.”); see also Anne Lavigne, *Pension Funds in France: Still a Dead End?*, 28 GENEVA PAPERS ON RISK & INS. 127, 136 (2003) (suggesting the destruction of pension wealth in the 1930s left the French skeptical toward pension funds); Kathryn L. Moore, *Lessons from the French Funding Debate*, 65 OHIO ST. L. J. 5, 25-26 (2004) (describing protests in 2003 to save the PAYGO system).

314. See Marcel Tyrell & Reinhard H. Schmidt, *Pension Systems and Financial Systems in Europe: A Comparison from the Point of View of Complementarity*, 47 IFO STUDIEN 469 (2001); PETER ALEXIS GOUREVITCH & JAMES J. SHINN, POLITICAL POWER AND CORPORATE CONTROL: THE NEW GLOBAL POLITICS OF CORPORATE GOVERNANCE 213-21 (2005); Martin Gelter, *The Pension System and the Rise of Shareholder Primacy*, 43 SETON HALL L. REV. 909, 963-68 (2013); David S. Scharfstein, *Presidential Address: Pension Policy and the Financial System*, 63 J. FIN. 1463 (2018).

normally not yet have been in the position to save considerable amounts for their retirement. Long COVID is also more likely to occur in females, who account for over 70% of Long Haulers. Like veterans, widows and refugees after World War II, their decent standard of living will likely have to be provided for and/or substituted by the government out of funds generated by current workers. After World War II, German economists endorsed the “Mackenroth formula,” according to which *current* economic surpluses must cover all *current* retirement expenses.<sup>315</sup>

As the pressure to pay our funds to Long Haulers increases, this will also mean that fewer funds will be available for saving and investment instead of being transferred and paid out as they are generated. For retirement funding, social systems and financial markets the described potential funding scheme changes likely mean that there will be less saving to cover *future* expenses. Productive, high-income earners will be more highly taxed, or a larger amount of funds will have to be diverted to government-run retirement systems, such as social security in the United States. In consequence, a smaller amount of funds will be available for personal retirement saving for these individuals. On the margin, amounts available for investment in the capital market will diminish, comparable to the situation in countries that opted for a PAYGO system after World War II. The funding gap will depend on the number of Long Haulers in the population that leave the labor force permanently but also on the savings of Long Haulers. Already now, many 401(k) plans contain only woefully inadequate amounts of savings.<sup>316</sup> The market impact of COVID-19, as well as the fact that many will withdraw money from pension plans early after the disruption of their livelihood,<sup>317</sup> will likely mean that the percentage of workers with inadequate retirement savings will increase. Females and minorities may be disproportionately negatively affected in the long run, while their savings dissipate in expected inflation and negative interest rate climates.<sup>318</sup> In this process, median voter preferences will likely shift away from emphasizing the protection of shareholders.<sup>319</sup>

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315. See Hockert, *supra* note 297.

316. E.g., TERESA GHILARUCCI & TONY JAMES, RESCUING RETIREMENT: A PLAN TO GUARANTEE RETIREMENT SECURITY FOR ALL AMERICANS 3, 31-36 (2020); Brian Anderson, *Index Reveals Americans' Heightened Worries Around Retirement*, 401K SPECIALIST MAG., (July 21, 2020), <https://401kspecialistmag.com/index-reveals-americans-heightened-worries-around-retirement> [<https://perma.cc/8ZN6-WX27>]; Gelter & Puaschunder, *supra* note 16.

317. In addition, CARES ACT § 2202 permits early distributions from retirement plans without a tax penalty under certain circumstances.

318. Monique Morrissey, *The State of American Retirement Savings*, ECON. POL'Y INST. (Dec. 10, 2019), <https://www.epi.org/publication/the-state-of-american-retirement-savings> [<https://perma.cc/KB5B-E48J>] (noting the majority of black and Hispanic families have no retirement savings); Gelter & Puaschunder, *supra* note 16.

319. See Gelter, *supra* note 314, at 949 (discussing the political preferences for shareholder primacy of US voters); Gelter & Puaschunder, *supra* note 16.

### 3. *COVID Rescue Packages and Their Economic Impact*

A related issue is how funds that could be saved for the future will need to be channeled into present-day use. Current governmental and governance COVID rescue and recovery aid started since the United States economy fell into recession in February 2020 in the wake of the news over COVID-19 and an evolving worldwide pandemic. Since the onset of the economic crisis in the fallout of the pandemic, the U.S. federal government responded with extensive fiscal stimulus packages and emergency relief. The U.S. Congress passed four special appropriations laws for the federal government to use in relief efforts, of which the largest was the Coronavirus Aid, Relief, and Economic Security (“CARES”) Act, which provides approximately 2.08 trillion U.S. dollars in unprecedentedly highest governmental aid in North American history.<sup>320</sup> These funds are directly or indirectly allocated towards industries and institutions that work on the recovery of COVID-19 Long Haulers or re-integration into a newly emerging workforce post-COVID-19. Future generations are likely to be affected by the economic recovery after the COVID-19 external shock – given the large amount of economic post-COVID-19 rescue and recovery packages that are funded on debt.<sup>321</sup>

Governmental efforts were coupled with the Federal Reserve taking monetary stimulus measures to stabilize and boost the economy in incremental interest rate cuts and discount rate drops down to 0.25%, and a Federal Reserve repurchase agreement interest rate of 0%.<sup>322</sup> Lending programs, loans and asset purchases were part of a 700 billion USD quantitative easing plan<sup>323</sup> with repurchasing options, as well as bonds financing and regulation changes, which are all meant

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320. CORONAVIRUS AID, RELIEF, AND ECONOMIC SECURITY ACT (CARES) ACT OF 2020, PUB. L. 116-136, § 4003(c)(2)(E) and (F), (3)(i)(I) and (II). For a more radical position, *see, e.g.*, Matt Stoller, *Five Conditions for Corporations About to Receive Coronavirus Bailouts*, PROMARKET (Mar. 17, 2020), <https://promarket.org/2020/03/17/five-conditions-for-corporations-about-to-receive-coronavirus-bailouts/> [<https://perma.cc/RE7T-AAEQ>] (suggesting firms should no longer be allowed to make buybacks and not pay any dividends for five years).

321. Gabe Alpert, *A Breakdown of the Fiscal and Monetary Responses to the Pandemic*, INVESTOPEDIA, <https://www.investopedia.com/government-stimulus-efforts-to-fight-the-covid-19-crisis-4799723> [<https://perma.cc/8WHP-Z872>] (last updated Dec. 30, 2021); *US Business Cycle Expansions and Contractions*, NAT’L BUREAU ECON. RSCH., <https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions> [<https://perma.cc/5H9E-B9D2>] (last visited Apr. 10, 2021).

322. Jeff Cox, *The Federal Reserve Just Pledged Asset Purchases with No Limit to Support Markets*, CNBC (Mar. 23, 2020), <https://www.cnbc.com/2020/03/23/fed-announces-a-slew-of-new-programs-to-help-markets-including-open-ended-asset-purchases.html> [<https://perma.cc/S97Q-M5MP>].

323. Jeanna Smialek & Neil Irwin, *Fed Slashes Rates to Near-Zero and Unveils Sweeping Program to Aid Economy*, N.Y. TIMES (Mar. 15, 2020), <https://www.nytimes.com/2020/03/15/business/economy/federal-reserve-coronavirus.html> [<https://perma.cc/WM2F-P758>].

to stabilize the market and foster liquidity.<sup>324</sup> The ongoing direct aid programs sum up trillions of U.S. dollars, of which 2.56 trillion were spent by the U.S. Federal Government as of March 31, 2021.<sup>325</sup> Four laws included an estimated 3.92 trillion U.S. dollars funding for credit, loans and loan guarantee programs.<sup>326</sup> The cost of saving the global economy is estimated to have been 834 million U.S. dollars per hour for 18 months as of August 2021 alone.<sup>327</sup>

Similar rescue and recovery efforts funded by bonds that will have to be repaid by future generations apply in European countries.<sup>328</sup> The European Union had a concerted Eurozone monetary policy administered by the European Central Bank that faced constraints due to an already low interest rate regime.<sup>329</sup> Recovery plans included the pandemic emergency longer-term refinancing operations, currency swaps, increased lending and Euro-denominated liquidity for central banks outside the Eurozone to provide market stability and financial liquidity partially enacted via bonds in the 128 billion U.S. dollar range.<sup>330</sup> The Pandemic Emergency Purchase Programme (“PEPP”) purchased 800 billion U.S. dollars in

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324. Alpert, *supra* note 321; Press Release, Bd. Governors Fed. Rsrv. Sys., Federal Reserve Actions to Support the Flow of Credit to Households and Businesses (Mar. 15, 2020), <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200315b.htm> [<https://perma.cc/3H5R-5RE6>].

325. USASPENDING, <https://www.usaspending.gov/> [<https://perma.cc/TD7E-PK5J>] (last visited Apr. 10, 2021).

326. *How is the Federal Government Funding Relief Efforts for COVID-19?*, USASPENDING, <https://datalab.usaspending.gov/federal-covid-funding/#fn1> [<https://perma.cc/4Y7T-X2CB>] (last visited Apr. 10, 2021).

327. Thomasson & Hirai, *supra* note 73.

328. Angelo Borselli & Ignacio Farrando Miguel, *Corporate Law Rules in Emergency Times Across Europe*, 2020 EUR. CO. & FIN. L. REV. 274, 308-9 (surveying the UK, France, Germany, Italy, and Spain). In addition, bank regulators around the world introduced limits on dividends and buybacks during the pandemic. See Patricia Kowsmann, *European Bank Dividend Ban Lifted, but Restrictions Remain*, WALL ST. J. (Dec. 15, 2020), <https://www.wsj.com/articles/european-bank-dividend-ban-lifted-but-restrictions-remain-11608060995> [<https://perma.cc/79YC-NLZH>].

329. Alpert, *supra* note 321; *Monetary Policy Decisions*, EUR. CENT. BANK, <https://www.ecb.europa.eu/press/govdec/mopo/html/index.en.html> [<https://perma.cc/6UNA-C5U6>] (last visited May 13, 2020).

330. Alpert, *supra* note 321; Press Release, Eur. Cent. Bank, ECB Announces New Pandemic Emergency Longer-Term Refinancing Operations (Apr. 30, 2020), [https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200430\\_1~477f400e39.en.html](https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200430_1~477f400e39.en.html) [<https://perma.cc/DVG6-LAZL>]; Press Release, Eur. Cent. Bank, *New Eurosystem Repo Facility to Provide Euro Liquidity to Non-Euro Area Central Banks* (June 25, 2020), <https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200625~60373986e5.en.html#:~:text=Under%20EUREP%2C%20the%20Eurosystem%20will,central%20governments%20and%20supranational%20institutions> [<https://perma.cc/46DP-9UXB>]; *Monetary Policy Decisions*, *supra* note 329; Press Release, Eur. Cent. Bank, *ECB Banking Supervision Provides Temporary Capital and Operational Relief in Reaction to Coronavirus* (Mar. 12, 2020), <https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200312~45417d8643.en.html> [<https://perma.cc/9YGH-SAUQ>].

bonds and commercial papers throughout the year 2020 that will be expanded up to a total of 1.5 trillion U.S. dollars until the end of June 2021 in order to reach a total target of 2.24 trillion U.S. dollars.<sup>331</sup> The European Union's concerted action to avert the economic downturns of the COVID-19 pandemic in a common fiscal stimulus proposal funded by Eurobonds triggered what experts already call the "Next Generation EU" that bring member states closer together in a fiscal union and stability solidarity pact.<sup>332</sup>

In addition to concerted European Union action, the national governments of the Eurozone countries passed fiscal and monetary policy acts in line with directives from the European Central Bank. Germany enacted the – by far – largest fiscal stimulus and Economic Stabilization Fund within the Eurozone with liquidity constraint relief summing to around 950 billion U.S. dollars.<sup>333</sup> Monetary and fiscal policy measures similar to those conducted by the European Central Bank were introduced in France, Italy, Spain, Austria and the Nordic countries with several subsequent stimulus and relief packages as the COVID-19 economic crisis unfolded.

In general, European aid tends to strengthen the relatively more public administered healthcare system and union-protected workers throughout Europe

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331. Alpert, *supra* note 321, *Monetary Policy Decisions*, *supra* note 329.

332. Alpert, *supra* note 321; Matina Stevis-Gridneff, *E.U. Adopts Groundbreaking Stimulus to Fight Coronavirus Recession*, N.Y. TIMES (July 20, 2020), <https://www.nytimes.com/2020/07/20/world/europe/eu-stimulus-coronavirus.html> [<https://perma.cc/477S-B7KM>]; Shalini Nagarajan, *The European Union's \$826 Billion Stimulus Plan to Battle the Coronavirus is 'Too Small and Too Late,' Analysts Say*, BUS. INSIDER (May 30, 2020), <https://www.businessinsider.com/what-eu-826-billion-covid-19-stimulus-package-means-2020-5> [<https://perma.cc/GGT8-7HJK>]; Jan Strupczewski & Kate Abnett, *EU Leaders Unblock 1.8 Trillion Euro Budget, Recovery Fund, Eye Climate Goals*, REUTERS (Dec. 9, 2020, 5:06 PM), <https://www.reuters.com/article/us-eu-summit/eu-leaders-unblock-1-8-trillion-euro-budget-recovery-fund-eye-climate-goals-idUSKBN28J37L> [<https://perma.cc/XKT8-HNWA>].

333. Alpert, *supra* note 321; Julia Anderson et al., *The Fiscal Response to the Economic Fallout from the Coronavirus*, BRUEGEL, <https://www.bruegel.org/publications/datasets/covid-national-dataset/> [<https://perma.cc/RKY4-4L89>] (last updated Nov. 24, 2020); Press Release, Minister Peter Altmaier, *Minister Altmaier: "Unprecedented Support Programme for Employees and Enterprises"* (Mar. 27, 2020), <https://www.bmwi.de/Redaktion/EN/Pressemitteilungen/2020/20200327-altmaier-unprecedented-support-programme-for-employees-and-enterprises.html> [<https://perma.cc/XV3F-JSSX>]; Press Release, Fed. Ministry of Fin., *Federal Government Takes Large-Scale Measures to Tackle Crisis Fallout* (Mar. 23, 2020), <https://www.bundesfinanzministerium.de/Content/EN/Pressemitteilungen/2020/2020-03-23-supplementary-budget.html> [<https://perma.cc/7KQS-H9JP>]; Bertrand Benoit & Tom Fairless, *Germany Boosts Already Hefty Coronavirus Stimulus*, WALL ST. J. (Aug. 26, 2020), <https://www.wsj.com/articles/germany-boosts-already-hefty-coronavirus-stimulus-11598440184> [<https://perma.cc/JSB3-KCXG>]; *Factbox: Germany's Stimulus Package Helps Consumers and Companies*, REUTERS (June 3, 2020, 6:44 PM), <https://www.reuters.com/article/us-health-coronavirus-germany-stimulus-p/factbox-germanys-stimulus-package-helps-consumers-and-companies-idUSKBN23A3IN> [<https://perma.cc/W6BP-NC5Y>].

– for instance when thinking about the *Kurzarbeit* model that allows for not laying-off workers during the pandemic but instead shortening their working hours.<sup>334</sup> Employee representation on the boards in Germany and other European countries, or at least a structured relationship with unions as it exists in many countries, may have facilitated more conciliatory measures to protect workers while allowing firms to reduce cost by switching to shorter working hours.<sup>335</sup> In addition, European governments tend to support households directly in addition to granting liquidity to businesses and social welfare.

The United Kingdom (“UK”) faced economic turmoil due to Brexit and trade re-negotiations during the onset of the pandemic. The Bank of England cut its benchmark interest rate twice to 0.1%<sup>336</sup> and purchased governmental and non-financial, investment corporate bonds in the range of 567 billion U.S. dollars.<sup>337</sup> In addition, the Bank of England initiated a scheme where it would extend credit to banks and take the bank’s loans to small and medium-sized enterprises as collaterals, thus creating incentives for banks to lend to such businesses.<sup>338</sup> Moreover, the British Covid Corporate Financing Facility (“CCFF”) program sets out to purchase commercial papers from firms that committed to reducing their dividends and share buybacks, and it permitted banks to create a reserve called

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334. Jones et al., *supra* note 74 (graphically showing data provided by the International Monetary Fund).

335. Jens Dammann & Horst Eidenmüller, *Taming the Corporate Leviathan: Codetermination and the Democratic State*, U. ILL. L. REV. 1, 50-52 (forthcoming 2022).

336. Alpert, *supra* note 321; *Monetary Policy Summary for the Special Monetary Policy Committee Meeting on 19 March 2020*, BANK ENG. (Mar. 19, 2020), <https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2020/monetary-policy-summary-for-the-special-monetary-policy-committee-meeting-on-19-march-2020> [<https://perma.cc/D5MK-ZUDF>]; *Bank of England Measures to Respond to the Economic Shock from Covid-19*, BANK ENG. (Mar. 11, 2020), <https://www.bankofengland.co.uk/news/2020/march/boe-measures-to-respond-to-the-economic-shock-from-covid-19> [<https://perma.cc/HWZ9-F75Q>].

337. Alpert, *supra* note 321; *Update on the Contingent Term Repo Facility (CTRF) - Market Notice 19 June 2020*, BANK ENG. (June 19, 2020), <https://www.bankofengland.co.uk/markets/market-notices/2020/update-on-the-contingent-term-repo-facility> [<https://perma.cc/VZ9V-QW8A>]; *Asset Purchase Facility (APF): Pricing of CBPS Eligible Securities – Market Notice 5 June 2020*, BANK ENG. (June 5, 2020), <https://www.bankofengland.co.uk/markets/market-notices/2020/apf-pricing-of-cbps-eligible-securities-june-2020> [<https://perma.cc/J9W2-JDH3>]; *Bank Rate Maintained at 0.1% - June 2020*, BANK ENG. (June 18, 2020), <https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2020/june-2020> [<https://perma.cc/9EVK-8JWW>]; *Bank Rate Held at 0.1% and Asset Purchases Increased by £150bn - November 2020*, BANK ENG. (Nov. 5, 2020), <https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2020/november-2020> [<https://perma.cc/X9GF-NSJB>].

338. Alpert, *supra* note 321; Bank of England, *Term Funding Scheme with Additional Incentives for SMEs (TFSME) – Market Notice*, BANK ENG. (Mar. 11, 2020), <https://www.bankofengland.co.uk/markets/market-notices/2020/term-funding-scheme-market-notice-mar-2020> [<https://perma.cc/W39Z-A2YP>].

“counter-cyclical capital buffer”<sup>339</sup> to aid liquidity in the banking sector.<sup>340</sup> The UK fiscal stimulus comprises six packages totaling up to 18% of the British GDP.<sup>341</sup>

The size, scope and dimensions of COVID-19 rescue and recovery plans are unprecedented and account for the historically largest concerted effort of action to avert the negative economic fallout from an external economic shock.<sup>342</sup> In confronting the crisis and evaluating international and governmental rescue packages, the size of rescue and recovery aid has gained widespread attention for potential negative consequences, such as long-term debt and inflation.<sup>343</sup>

Governments around the world that strengthened their position as crisis managers and financial aid planners during the pandemic may now use their newfound powers to address other issues.<sup>344</sup> Strengthened command-and-control powers after COVID-19 may persist beyond the virus crisis. Crisis alleviation expertise may be used to combat other societal threats and concerns besides COVID-19, such as inequality, social injustice and climate change but also tackling a healthcare crisis in COVID long haul sufferers. Already now, the iconic governmental Coronavirus rescue packages and bailout aids are being used to implement system change towards an arguably more just and environmentally friendly society.<sup>345</sup>

The COVID-19 governmental shock therapy implied that governmental aid is either directly channeled to pro-social causes or targeted at strategically setting positive market incentives. Governmental crisis management may also use its regrown authority and the corporate dependency on public emergency funds and rescue bail-out packages to set incentives to implement environmental degrowth

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339. Alpert, *supra* note 321; Bank of England, *HM Treasury and the Bank of England Launch a Covid Corporate Financing Facility (CCFF)*, BANK ENG. (Mar. 17, 2020), <https://www.bankofengland.co.uk/news/2020/march/hmt-and-boe-launch-a-covid-corporate-financing-facility> [<https://perma.cc/ZFP6-PQUF>].

340. Alpert, *supra* note 321; Huw Jones & David Milliken, *Bank of England Cancels Stress Test of Banks Over Coronavirus*, REUTERS (Mar. 20, 2020), <https://www.reuters.com/article/us-health-coronavirus-britain-regulation/bank-of-england-cancels-stress-test-of-banks-over-coronavirus-idUSKBN2170QI> [<https://perma.cc/45V2-A8MV>]; Press Release, Bank. Eng., *HM Treasury and Bank of England Announce Temporary Extension to Ways and Means Facility* (Apr. 9, 2020), <https://www.bankofengland.co.uk/news/2020/april/hmt-and-boe-announce-temporary-extension-to-ways-and-means-facility> [<https://perma.cc/62VX-DYH6>].

341. Alpert, *supra* note 321; Magdalena Szmigiera, *Value of COVID-19 Stimulus Packages in the G20 as Share of GDP 2021*, STATISTA (Nov. 19, 2021), <https://www.statista.com/statistics/1107572/covid-19-value-g20-stimulus-packages-share-gdp/> [<https://perma.cc/ME42-4WDX>].

342. Thomasson & Hirai, *supra* note 73.

343. BRUNNERMEIER, *supra* note 22.

344. *E.g.*, Nicholas Mulder, *The Coronavirus War Economy Will Change the World*, FOREIGN POL’Y (Mar. 26, 2020, 6:29 AM), <https://foreignpolicy.com/2020/03/26/the-coronavirus-war-economy-will-change-the-world/> [<https://perma.cc/3MVY-6Y93>] (among other things, speculating that governments might use their emergency powers to combat climate change).

345. Monck, *supra* note 66.

as outlined in the Green New Deal (“GND”) or foster a sustainable finance taxonomy as promoted in the European Green Deal.<sup>346</sup> Making the governmental grants dependent on certain conditionalities may also allow governments to direct firms to address the climate change challenge.<sup>347</sup> The GND may thereby serve as a broad-based market solution to implement global environmental and pro-social governance as “the sum of the many ways individuals and institutions, public and private, manage their common affairs.”<sup>348</sup> The potential focus of bailouts and recovery ranges from an urban-local and national focus to even global and future-oriented beneficiaries, as pursued in public investments promoted in the Green New Deal or European Green Deal Sustainable Finance Taxonomy.<sup>349</sup>

On a shorter time horizon, the massive amount of funding holds enormous potential to alleviate inequality that may stem from or have deepened during the COVID-19 crisis, such as in the previously described financial market versus real economy gap. But also, industry-specific inflation patterns as well as urban-versus-rural disposable income differences in the wake of ambitious bailout and recovery plans should be considered when choosing bailout targets wisely to uplift those with a disproportionate burden.<sup>350</sup> As blatantly visible among COVID Long Haulers, the remission potential being age-dependent but also the gender propensity to become a COVID Long Hauler being skewed towards females puts a disproportionately heavy burden on specific societal cohorts and gender groups. Transfer payments between COVID winners and losers but also redirection of funds for those in need based on a legal disparate impact analysis will hopefully be at the core of international COVID rescue and recovery.

In the evaluation and monitoring of these unprecedentedly large amounts of governmental stimulus, economic bailout and rescue packages, socio-economic attention should also be paid to the intergenerational inequality entailed in leaving a massive wave of debt to future generations.<sup>351</sup> The rescue and recovery funds based on bonds funded via debt may also include future welfare targets to steer

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346. Gelter & Puaschunder, *supra* note 16.

347. These could be used for investments in clean energy innovations, for instance, such as decentralized energy grids enabled via solar panels or ecologically-harmonious infrastructures in the sharing economy. See MARIANA MAZZUCATO, *THE ENTREPRENEURIAL STATE: DEBUNKING PUBLIC VS. PRIVATE SECTOR MYTHS* (2015); *The Economics of Climate*, 56 FIN. & DEV. 1 (2019); *The Impact of Investing*, N.Y.C. MUN. WATER FIN. AUTH., <https://www1.nyc.gov/site/nyw/investing-in-nyw-bonds/the-impact-of-investing.page> [<https://perma.cc/55W5-H5HN>] (last visited Jan. 11, 2021).

348. Gelter & Puaschunder, *supra* note 16, at 616.

349. Symposium, *Confronting Crisis: Preparing for the Unexpected*, OHIO ST. BUS. L.J. (2021).

350. Julia M. Puaschunder, *On the Social Representations of Intergenerational Equity*, 4 OXFORD J. FIN. & RISK PERSP. 4, 78-99 (2015).

351. *Id.*; see also JULIA M. PUASCHUNDER, *INTERGENERATIONAL EQUITY: CORPORATE AND FINANCIAL LEADERSHIP* (2019); JULIA M. PUASCHUNDER, *GLOBAL RESPONSIBLE INTERGENERATIONAL LEADERSHIP: A CONCEPTUAL FRAMEWORK AND IMPLEMENTATION GUIDANCE FOR INTERGENERATIONAL FAIRNESS* (2017).

positive market change over time with fruition coming to life after our generation. Focus on future beneficiaries lies at the heart of the Green New Deal and the European Green Deal. As the social welfare innovation of our times, the middle agers of today longing for rest and recovery may be funded by future generations. In lieu, future world inhabitants may inherit a favorably stable climate thanks to dramatic market changes and lifestyle shifts towards harmony with the environment our generation has taken in the eye of recovering from a global pandemic.<sup>352</sup>

#### 4. *Impact on Healthcare Markets*

In alleviating the COVID-19 long-haul crisis, interdisciplinary viewpoints could also integrate the widespread impact COVID-19 will likely have on healthcare. The trend toward vaccinations reducing the risk of severe COVID-19 infection trajectories but also information exchange online about long-haul symptoms persisting after mild infections may shift future medical attention to focus on chronic diseases instead of just treating acute consequences. Precautious medical intervention through vaccinations focused on a highly complex and fragile individual immune system could also be extended with insights about the unspecific immune system.<sup>353</sup> The current societal discussion and policy intervention makes it apparent that society is vulnerable when reducing the potential for diversification.<sup>354</sup> In light of the fact that viruses constantly mutate, a wide range of remedies need to be developed in the future, including tools to detect viral loads and precautionary interventions in the environmental setting. A symptom-centered approach often does not cure the underlying chronic disease. Focusing merely on treating symptoms and/or suppressing the body's immune response to treat autoimmune diseases, which some Long Haulers are experiencing, implicitly produces unnecessary suffering.<sup>355</sup> Individual health, monetary and social costs occur when individuals wait with prevention until symptoms flare up or autoimmune imbalances cause damage to healthy parts of the body. But also, global costs for medication rise as large amounts of CO<sub>2</sub> and environmental pollution occur because of drug development. Medication may also become ineffective if widespread population resistance against its effects builds up. Persistent drug use from an early age may also cause organ impairment, drug addiction and a respective number of chemical residues in the groundwater.

Long-term effects of a novel virus and physical stress impacting chronic

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352. See Sergey Orlov et al., *Green Bonds, Transition to a Low-Carbon Economy, and Intergenerational Fairness: Evidence from an Extended DICE Model*, INT'L INST. FOR APPLIED SYS. ANALYSIS 1 (2018); Jeffrey D. Sachs, *Climate Change and Intergenerational Well-Being*, in THE OXFORD HANDBOOK OF THE MACROECONOMICS OF GLOBAL WARMING 248-259 (Lucas Bernard & Willi Semmler eds. 2014).

353. *Interdisciplinary, Multimedia Conference*, *supra* note 12.

354. *Id.*

355. *Id.*

diseases compounded by rapid climate change will likely lead to a rethinking of medical care. Attention will be paid to the environmental impact on health, but also vice versa the effect of healthcare on the environment. Holistic salutogenesis could help find a well-rounded understanding of why environmental stressors may cause long-term debilitation in chronic diseases. Living in harmony with the external environment could be integrated into the strengthening of recovery medicine in the aftermath of the COVID-19 crisis.

In all of this, the COVID-19 pandemic may herald a legal and regulatory revolution for the general healthcare and well-being of people in line with the biological limits of a fragile planet. In addition to focusing on symptom relief, already now there seems to be an appreciation of emphasizing alternative treatments promoted in Long Hauler online Survivor Corps support groups.<sup>356</sup> As discussed in section 3.2.4, a trend towards life-long prevention and holistic medical care with respect for the power of a healing harmony with the environment are likely to follow. The next revolution in healthcare may feature a ‘greening’ of lifestyles in healthy nutrition as holistic preventive care that can have faster individual results than large-scale economic greening projects, such as outlined in the United States Green New Deal and the European Green Deal.<sup>357</sup> Governmental approaches that target large-scale industry redefinition or a future planned greening of industries, such as the planned transition from heavy industries to renewables, can thereby be complemented by broad-based individual lifestyle changes that matter not only to individuals becoming free of COVID long-haul symptoms caused by external stressors and environmental irritation, but also on its larger dimension in the social compound and over time to future generations.<sup>358</sup> For instance, human eating habits and nutrition choices make up an estimated 30-40% of the CO<sub>2</sub> pollution if the combined regionality, seasonality and food waste are all taken into consideration.<sup>359</sup>

##### 5. *Law & Economics of Rest, Recovery, and Minimalism*

As for a scientific system change, the field of economics is dominated by the aim to maximize profits with a focus on financial wealth accumulation. Health – as the topic of our time – has gained unprecedented attention that will likely grow as the numbers of Long Haulers swell. With broad-based infection of an endemic virus and with its long-term impetus, COVID-19 could become a means to redefine health and well-being as a primary goal of the economy, ecology and politics.<sup>360</sup>

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356. See Yang Yang et al., *Traditional Chinese Medicine in the Treatment of Patients Infected with 2019 - New Coronavirus (SARS-CoV-2): A Review and Perspective*, 16 INT’L J. BIOLOGICAL SCI. 1708 (2020).

357. Barbier, *supra* note 197; Pargendler, *supra* note 197; Letter from Members, Earthworks, *supra* note 197; *A European Green Deal*, *supra* note 201.

358. *Interdisciplinary, Multimedia Conference*, *supra* note 12.

359. *Id.*

360. *Id.*

Given that the estimated majority of Long Haulers (around 70-80%) are currently believed to be female, but also taking into account that about one third of all Long Haulers' symptoms come in waves during debilitating COVID long-haul episodes;<sup>361</sup> the future analysis of macroeconomic aggregates and policy impacts is likely to reflect a more diversified, gender-sensitive and temporal view of social preferences under unpredictably changing conditions.

In all of these prospective trends, the 21<sup>st</sup> century may turn out to be an unprecedented time of dis-economics that values everything contrary to the neoclassic idea of economics guiding on productivity, maximization and efficiency striving.<sup>362</sup> Neoclassical axioms of business, finance and economic research have a limited understanding of health and well-being.<sup>363</sup> Traditional economic growth theories considered capital and labor as essential push factors for every economy.<sup>364</sup> Exogenous growth theory is centered on exogenous shocks. New technology innovations or natural crises – such as pandemics – are captured as major drivers or downturns of economic growth. Economic theory tries to measure the impact of economic driver triggers and exogenous shocks on capital and labor productivity.<sup>365</sup> Endogenous growth theory draws attention to dynamic interactions between capital and labor but also endogenous growth derived from ideas, innovation and learning.<sup>366</sup> Growth concepts were opened up for innovation generated in productive group interaction and learning in teams inside firms, learning-by-doing while performing tasks and learning-by-using of new technology.<sup>367</sup>

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361. Davis et al., *supra* note 47; Yong, *supra* note 291; Collins, *supra* note 291; Doheny, *supra* note 44.

362. Puaschunder, *supra* note 46.

363. *Id.*

364. See Evsey D. Domar, *Capital Expansion, Rate of Growth, and Employment*, 14 *ECONOMETRICA* 137 (1946); Sir Henry Roy Forbes Harrod, *An Essay in Dynamic Theory*, 49 *ECON. J.* 14 (1939); Nicholas Kaldor, *A Model of Economic Growth*, 67 *ECON. J.* 591-624 (1957).

365. Nicholas Kaldor, *Capital Accumulation and Economic Growth*, in *THE THEORY OF CAPITAL* 177 (F.A. Lutz & D.C. Hague eds. 1961); see also Robert M. Solow, *Is the End of the World at Hand?* 16 *CHALLENGE* 39 (1973); Robert M. Solow, *A Contribution to the Theory of Economic Growth*, 70 *Q. J. ECON.* 65 (1956); Robert M. Solow, *Technical Change and the Aggregate Production Function*, 39 *REV. ECON. & STAT.* 312 (1957); Trevor W. Swan, *Economic Growth and Capital Accumulation*, 32 *ECON. REC.* 334 (1956).

366. See Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* (R.R. Nelson ed. 1962); Robert E. Lucas, *On the Mechanics of Economic Development*, 22 *J. MONETARY ECON.* 3 (1988); LUIGI L. PASINETTI, *STRUCTURAL CHANGE AND ECONOMIC GROWTH: A THEORETICAL ESSAY ON THE DYNAMICS OF THE WEALTH OF NATIONS* (1983); Paul M. Romer, *Increasing Returns and Long-Run Growth*, 94 *J. POL. ECON.* 1002 (1986); Paul M. Romer, *Endogenous Technological Change*, 98 *J. POL. ECON.* 71 (1990); Hirofumi Uzawa, *Optimum Technical Change in an Aggregative Model of Economic Growth*, 6 *INT'L ECON. REV.* 18 (1965).

367. See Philippe Aghion & Peter Howitt, *A Model of Growth Through Creative Destruction*, 60 *ECONOMETRICA* 323 (1992); PHILIPPE AGHION & PETER W. HOWITT, *ENDOGENOUS GROWTH*

The outbreak of the novel Coronavirus heightened attention to hygiene and healthcare. Applying exogenous growth theory, the health risk exposure to the exogenous shock of COVID-19 differs between employees, firms, industries, environments, and countries. Health of labor capital but also a risk-free working culture and environment are expected to become essential features of a vital workplace. Precaution, exposure, and long-term health care are also industry specific. All these variables will likely become new determinants of countries' comparative advantages that overall drives economic growth in a COVID-19-struck economy.<sup>368</sup>

In endogenous growth theory terms, team hygiene and group monitoring of the collective health status but also learning-to-preventing holds future economic growth potential.<sup>369</sup> Applications of growth models adjusted to COVID-19 should also include inequality of growth in the digital age, which will likely rise as the COVID recovery will be digitalized.<sup>370</sup>

One can therefore hope for an economic renaissance that will emerge after COVID-19 with a focus on the economics of health and well-being. Preventive care and productivity will likely become subject areas that gain attention. In light of COVID-19 long-haul episodes of rest and recovery as well as debilitation changing erratically and unpredictably, economics could also inform a more diversified and individual intertemporal discounting function. Behavioral insights on how to navigate a turbulent world with attention deficits and under uncertainty about health status conditions may become fundamental for developing an idea of the economic benefits of rest.<sup>371</sup> Preferences for minimalism will likely gain popularity in a turbulent world longing for recovery.

In the distribution of COVID-19 relief, a system change may be accomplished when being guided by the interdisciplinary insights of 'Law and Economics' that in particular can address the disparate impact of the disease in order to derive targeted inequality alleviation strategies. As interpreted by the federal courts, a violation of Title VII of the Civil Rights Act, which prohibits employment discrimination, may be shown by establishing "that an employment practice or policy has a disproportionately adverse effect on members of the

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THEORY (1998); Neville Francis & Valerie A. Ramey, *Is the Technology-Driven Real Business Cycle Hypothesis Dead?* NAT'L BUREAU ECON. RSCH. 1 (2002); Robert E. Hall & Charles I. Jones, *Why Do Some Countries Produce So Much More Output Per Worker Than Others?*, 114 Q. J. ECON. 83 (Feb. 1999); Siegfried Sharma, *Learning by Using: The Learning of a New Language*, RSCH. ASS'N INTERDISC. STUD. 123 (2020).

368. Gelter & Puauschunder, *supra* note 16; DAVID RICARDO, *ON THE PRINCIPLES OF POLITICAL ECONOMY AND TAXATION* (1817).

369. See Julia M. Puauschunder, *Economic Growth in Times of Pandemics*, PROC. CONSCIENS CONF. ON SCI. & SOC'Y 1 (2020).

370. *The Next Normal*, *supra* note 206.

371. Oliver Burkeman, *Escaping the Efficiency Trap—and Finding Some Peace of Mind*, WALL ST. J. (Aug. 6, 2021, 11:12 AM), <https://www.wsj.com/articles/escaping-the-efficiency-trap-and-finding-some-peace-of-mind-11628262751> [<https://perma.cc/ZAZ8-Q9NJ>].

protected class as compared with nonmembers of the protected class.”<sup>372</sup> Thus, formally neutral employment policies may be considered discriminatory in effect, even if discrimination is not intended by the employer. With a generation of COVID-19 Long Haulers affecting age and gender groups differently, being more likely occurring in thirty to fifty-year-old females, one could draw inspiration from the concept of disparate impact. While Long Haulers are not as such a protected class, certain demographic groups, particularly middle-aged females, appear to be more likely affected by COVID-19 in the long run. Employment policies that affect those afflicted with propensities for developing Long Haul COVID more than others could indirectly violate the disparate impact standard. For instance, if employers order returns to workplaces, this could imply a disproportionate risk and impact on the likelihood to develop COVID Long Haul for middle-aged females. The density and likelihood of being exposed to the virus may also play a role in particular human contact-facing industries.

Future economic policy research should be informed by legal expertise on the disparate impact, which could open up the black box of the neoclassical aggregate economic functions calculus as a measure of economic growth. The combined expertise of Law and Economics in their unique interaction may shed light on disparate impacts of disease, public health and economic relief measures. This may lead to an interdisciplinary framework for crisis alleviation through redistribution that in combination can set the course for a better future in a more compassionate and inclusive world.

#### IV. OUTLOOK TOWARD FUTURE RESEARCH AND POLICY

We have argued that COVID-19 as a ‘polycrisis’ results in long-term societal changes that can broadly be summarized in a drive to preventive healthcare and a more whole-rounded recovery spectrum, digitalization aiding to fill human gaps, as well as deurbanization into agro-hoods with closeness to nature. The socio-economic impetus of a Long-Haul wave on the general healthcare, workforce and the overall societal socio-economic system in the decades to come will likely boost real-time self-monitoring of the personal healthcare status, flourish eco-wellness nutrition lifestyle change trends and require a reorganization of social welfare systems and rethinking of an economic appreciation of deurbanization, rest and calm in corporate conduct and economic calculus.

On the legal level, long COVID-19 may result in class actions against employers or those responsible for ‘superspreader’ events. Disability status claims, as well as healthcare and pension reform needs will arise in light of the relatively young age of Long Haulers being focused on recovery and rest rather than economic productivity, which may change productivity and tax revenue substantially. Artificial intelligence, robotics, and big data insights to fill productivity gaps in humans with brain fog and cognitive impairment that comes and goes in waves are likely coming advancements to well-roundedly aid and

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372. *E.g.*, *E.E.O.C. v. Sambo's of Georgia, Inc.*, 530 F. Supp. 86, 92 (N.D. Ga. 1981).

integrate Long Haulers in society. The rights of vulnerable populations turning to online social forums to discuss their impairment problems will have to be defended in the years to come as these citizen scientists sacrifice privacy and put themselves at risk of manipulation and discrimination.

The envisioned future online forums to discuss and interact must be designed with caution, connecting us for collective information exchange fueled by emotional participation in common platforms that uphold dignity in privacy and appreciation for a respective communication culture. The beauty of enjoying lavish network effects and delving into world-wide collective emotional feasts also bears a responsibility to worship our common virtual luxury temples together wisely, conscientiously, and sustainably. Big data in the healthcare sector should only be used with caution, such as in targeted information releases, to avoid discrimination. For instance, only anonymized data slices should be made available to the public in order to prevent stigmatization and discrimination based on predictable prevalence propensities within population groups or certain living areas. Taxation of data transfer revenues will grant the fiscal space to offset losses and the social costs of market distortions caused by new technologies taking over human tasks and entering the workforce in the medical marketplace. Tax revenue would also aid in guiding citizens to become more self-determined, mature, and decisive about healthcare prevention in early-on education programs that sensitize the population about potential downsides of open information exchange online. Preventative healthcare measures taken while still in a healthy state are cheaper and preferable to first symptom-centered emergency room treatment. Prevention gives people long-term flexibility through self-chosen behavioral changes. The ongoing prevention revolution will also lead to a self-determined democratization of the health system in the global development of humankind.

From an economics perspective, firms will have to become resilient to the crisis, and consequently engage in long-term conversations about prevention, health, and precaution with their workforce. The unevenly distributed effects of the crisis and the growing income gap between financial market profit opportunities and real-world payment bottlenecks have increased harmful behavior such as an unhealthy diet, medication abuse and drug consumption as well as socio-psychological suffering in population groups that were already weakened before the crisis. Social inequality and the unequal effects of rising inflation and long-term low interest rates reinforce the desire for a fair social compound in harmony with the environment. The existing trends toward attention to inequality, social justice and climate change risk will accelerate the tendency toward a broadening of corporate purpose toward stakeholderism, which has already begun in the past years.<sup>373</sup> This will especially come to life in high

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373. See Catherine C. Langlois & Bodo B. Schlegelmilch, *Do Corporate Codes of Ethics Reflect National Character? Evidence from Europe and the United States*, 21 J. INT'L BUS. STUD. 519-28 (1990); Abigail McWilliams & Donald Siegel, *Corporate Social Responsibility and Financial Performance: Correlation or Misspecification?*, 21 STRAT. MGMT. J. 603 (2000); Julia M. Pauschunder, *Intergenerational Climate Change Burden Sharing: An Economics of Climate Stability Research Agenda Proposal*, 16 GLOB. J. MGMT. & BUS. 31 (2016); Emanuele Camiglio

contagion risk industries and professions with exposure to masses of people that may spread the virus.

The pandemic will change the way individuals consume in line with a more environmentally conscientious lifestyle aiding on sustainability, which will bottom-up influence the corporate world. With the COVID-19 crisis having inspired millions of workers to chase meaning in work, the time for ‘passion economies’ has come.<sup>374</sup> COVID triggered widespread attention to a healthy and consumption-conscientious way of living. This also goes hand-in-hand with sustainability pledges as green food choices often meet the criteria of ecological and CO<sub>2</sub>-friendly production. COVID-19 increased the call for firms and institutional investors to pay attention to healthy lifestyles that foster prevention and help reduce the spread of the pandemic.<sup>375</sup> With the wider stakeholder community paying attention to ethical considerations of the asset issuing entities, socially responsible investment and divestiture from environmentally-harmful actions will rise.<sup>376</sup> Corporations may also have to give in to stakeholder pressures advocating for corporations to serve the greater good and wider stakeholder community. Socially responsible investment and carbon divestiture are effective corporate strategies against the backdrop of a warming globe. Empirical research already found that corporate social engagement was associated with corporate financial performance and positively related to long-term investments via litigation risk minimization, branding and widespread community support.<sup>377</sup> Corporations that opt for early withdrawal may enjoy first-mover advantages in signaling pro-active ethical leadership in an already ongoing transition to renewable energy. In addition, such firms may qualify to issue climate bonds,<sup>378</sup> thus reducing firms’ costs of capital allowing them to use the green finance taxonomy as a strategic, entrepreneurial move.<sup>379</sup> Further, corporations remaining

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et al., *Climate Change Challenges for Central Banks and Financial Regulators*, 8 NATURE CLIMATE CHANGE 462 (2018).

374. David Vallance, *My Pandemic Pivot: How Crisis Inspired Millions to Chase Meaning in Their Work*, DROPBOX BLOG (Aug. 31, 2021), <https://blog.dropbox.com/topics/work-culture/my-pandemic-pivot> [https://perma.cc/67G5-RGF8].

375. *Supra* section 3.2.3.

376. KEN LITTLE, *THE COMPLETE IDIOT’S GUIDE TO SOCIALLY RESPONSIBLE INVESTING: PUT YOUR MONEY WHERE YOUR VALUES ARE* (2008).

377. See Tae Hee Choi & Jinchul Jung, *Ethical Commitment, Financial Performance, and Valuation: An Empirical Investigation of Korean Companies*, 81 J. BUS. ETH. 447 (2008); Sandra A. Waddock & Samuel B. Graves, *The Corporate Social Performance – Financial Performance Link*, 18 STRAT. MGMT. J. 303 (1997).

378. These could be used for investments in clean energy innovations such as solar power and wind turbines, eco-friendly infrastructure and more research and development in clean energy and green technology. MAZZUCATO, *supra* note 347; *The Economics of Climate*, *supra* note 347; *The Impact of Investing*, *supra* note 347.

379. Julia M. Puaschunder, *When Investors Care About Politics: A Meta-Synthesis of Political Divestiture Studies on the Capital Flight from South Africa During Apartheid*, 5 BUS. PEACE & SUSTAINABLE DEV. 24, 29-52 (2015).

in carbon-intensive unstable markets may suffer long-term losses in the wake of an overall economic market decline in carbon industries and may be exposed to future litigation risks for environmental damages that could have been avoided by fossil fuel divestiture.

Government bailout packages are likely to be financed over the long term by the historically lowest, never-so-long-low key interest rates. Low key interest rates will continue to allow the capital market to flourish. But this is based on the cost of a weakening of the potential of the interest rate as a monetary policy tool, which the economist John Maynard Keynes described as a “liquidity trap.”<sup>380</sup> The low interest rate policy brings along long-term external financing of past ideas, which impairs the flexibility of investors to finance future-oriented innovations and may hold back societal progress. Low interest rates on savings accounts in the real economy keep people trapped in the debt financing of past dreams. Household debt traps are causing massive psychosocial burdens. A so-called ‘deaths of despair’ trend is already noticed in the US for mid-career death spikes induced by alcoholism, drug use and suicide.<sup>381</sup> The strong contrasts between COVID-19 winners and losers as well as the deep gap between strongly-positive financial market developments and the negative performance of the real economy induced by lockdowns, which is currently exposing the real economy to a wave of private bankruptcies and liquidity bottlenecks, therefore call on governments around the world to reboot financial markets to return to be a service industry – to serve the real economy. In this sense, the generally low interest rate creates a situation that the financial world lives at the expense of the real economy.

Governance to overcome potential social friction – due to the strong polarization of financial profits sponsored by low key interest rate policy and the real economy financial constraints – points at taxing the COVID-profit industries, especially digitization winners, which could create fiscal space for redistributing some of the economic gains to industries that clearly lose from COVID-19. Taxation of digitalized economic growth during our forced digitalization disruption could provide the necessary redistribution funds to back the liquidity-dried real economy, which also faces exposure to liability risks of superspreader infection events and a propensity to higher human touchpoint frequency.

Governments can also bring back the financial world in the service of improving and stabilizing the real economy in a stricter separation between investment and consumer banks, which already began in the course of the regulations following the 2008/09 recession. Central banks could offer diversified interest rates. Low key interest rates for driving innovation and economic growth in the financial sector could refund higher interest rates for the real economy savings for consumers in order to avert socio-psychological frictions from individual over-indebtedness in households. Online currencies, such as the currently planned European Central Bank digital currency, could help a transparent use of the currency over time to strictly divert interest rate profits and

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380. KEYNES, *supra* note 134.

381. ANNE CASE & ANGUS DEATON, DEATHS OF DESPAIR AND THE FUTURE OF CAPITALISM (2020).

avoid arbitrage or interest rate swapping. Mutual collateral insurance between the financial world and the real economy would also be possible in order to spread risk. Bonds could be used to enable innovations, while repayments should be redistributed to the real economy.

In addition, banks could be encouraged to use the current profits for future large-scale investments that add societal long-term value. For example, large construction projects but also innovation in research and development are valuable macroeconomic multipliers that can benefit society as a whole in the short and especially the long term.<sup>382</sup> Governments and intergovernmental bodies, as well as the European Union as a supranational organization, have the long-term vision and financial freedom to operate on deficits but also the regulatory means to enact large-scale redistribution and long-term wealth creation in grand investments for the future.

Neoclassical ideas of business, finance and economic research are limited in their understanding of health and well-being. Traditional economic growth theories considered capital and labor as essential growth factors for every economy. The outbreak of the novel Coronavirus heightened attention to hygiene and healthcare. According to exogenous growth theory, the health risk exposure to the exogenous shock of COVID-19 differs between employees, firms, industries, environments, and countries. Health of human capital but also a risk-free working culture, environment, industry, and country will permit flourishing and growth in a COVID-19-struck economy. In endogenous growth theory terms, team hygiene and group monitoring of the collective health status but also learning-to-preventing hold future economic growth potential. Applications of COVID-19 adjusted growth models should also include inequality of growth in the digital age.

While standard economic cycle theories primarily focus on describing economic correlates of booms and busts, less attention is paid to socio-economic correlates and collective fallouts of inflation expectations and interest rate pressures. Inflation has progressively entered the prevailing narrative among the people of our times.<sup>383</sup> An expected longer-lasting inflationary pressure within society, corporations and consumers will also mean a long-hauling effect of a disproportionately heavy impact of inflation on the most vulnerable populations.<sup>384</sup> Further, we are currently experiencing the longest-ever period of a low interest rate regime. This fosters capital flow for innovation in the finance world, while it disincentivizes household savings and decreases private consumers' resiliency. When it comes to the discussion of inflation induced in the economy by quantitative easing to pay for the rescue of the economy and uphold decent living conditions and social standards for everyone in an inclusive society, we have to acknowledge the differentiated effect of inflation on different social strata and subsequently following propensities of different social groups in order

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382. KEYNES, *supra* note 134.

383. *May Research Letter: The 3 Pillars of Inflation*, CRESCAT CAP. (May 19, 2021), <https://www.crescat.net/may-research-letter/> [<https://perma.cc/Z2S6-T45L>].

384. *Id.*

to alleviate the disproportionately heavy burden on marginalized groups.<sup>385</sup>

Studying the multi-faceted influence factors on COVID-19 long-haul fallouts may offer invaluable insights on how to avert and alleviate the negative impacts of COVID on marginalized groups. The role of socio-economic correlates and socio-psychological fallouts from economic cycles, however, has not gotten enough attention in scholarship. Likewise, policy proposals do not yet fully reflect these behavioral dynamics and interactive effects. This information is yet fundamental to understanding the collective moods in society during a crisis and the individual well-being adjacent to it that differs heavily between different social groups. The need to find a collective long-haul solution within the social compound and specific focus on disparate impacts of the crisis and its recovery on certain societal classes have not yet been recognized in the wealth of writings on Federal Reserve and Central Bank interventions, which range from fiscal and monetary policies, including interest rates to direct monetary stimulus such as quantitative easing. Law and economics scholars and practitioners could fill this gap, which is currently also gaining attention from the COVID Long Hauler Survivor Corps online. Studying the effect of economic correlates to shape decisions about one's own lifestyle over time and in the eye of prospective long-term life changing effects of COVID-19 could be a fundamental impetus for future legal research, jurisprudence, and legal practice. All these endeavors will hopefully provide guidance on how to control future external shocks in humaneled responses that improve the overall well-being of society. In handling the crisis with respect for legal advancement, economic behavioral shifts and disparate-impact conscientious policymaking, this generation can establish a lasting legacy as a gift to future generations in the form of collective knowledge on how to overcome a global crisis wisely with social justice sensitivity and compassion.

#### V. CONCLUSION

The novel coronavirus SARS-CoV-2 is an external shock to all world societies with lasting implications. Given the size, scope and impetus of the pandemic that is expected to generate a wave of COVID-19 Long Haulers as implicit agents of change, the crisis holds the potential to affect our world and modern society permanently.

This Article highlighted three prospective trends that will likely shape our future world to come. Speculating about these potential changes lies at the core of navigating through a turbulent time with vigilance. After all, history offers a vital account of multiple records when crises, upheaval and periods of severe social and economic disruptions and their following recovery periods became essential turning points for lasting societal change and spring feathers of eventual betterment and comprehensive social advancement.

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385. Jacob Passy, *An Inflation Storm is Coming for the U.S. Housing Market*, MARKETWATCH (July 13, 2021), <https://www.msn.com/en-us/money/realestate/an-inflation-storm-is-coming-for-the-u-s-housing-market/ar-AAKWtdx?ocid=msedgntp> [<https://perma.cc/SNL8-D2SW>]; Cassim et al., *supra* note 20; Press Release, President Joe Biden, *supra* note 20.

Overall, capturing the contemporary trends and societal tendencies as well as their long-term consequences allows us to draw larger lessons for law, governance, and economic analysis. In the future, we may see a reconfiguration of institutions in many jurisdictions and a different understanding of health and well-being in the larger environmental context contributing to a more behaviorally informed economic profession.

Aspects of economic development – such as corporate governance – have often been analogized to biological evolution.<sup>386</sup> As the shock of the pandemic had an immediate effect on all countries around the world, the long-term COVID-19 long-haul impact is likely to change the larger legal frameworks and economic environment but also societal structure of modern democracies for years to come. While corporate governance evolved gradually since World War II in most Western jurisdictions,<sup>387</sup> COVID-19 may trigger leaps in social and economic structures and institutions around the world that create a long run trajectory of system change. As long as long-haul symptoms persist in a growing body of previously infected, we are likely to see direct and indirect persistent effects in the future.

In light of the potential of the Coronavirus to create an endemic threat and a wave of long-term debilitated COVID-19 Long Haulers, the governance and power dynamics in modern workplaces are expected to shift lastingly. Attention to a healthy productive environment as well as long-term prevention and healthcare focus will likely become essential features of tomorrow's corporate world. Employers are already facing pressure to create a safe and secure working environment but are also concerned about liability risks considering potential long-term disability arising from unsafe working conditions. These economic and legal costs may be outsourced to outside agencies – such as insurers, healthcare consultants, the government or intergovernmental bodies, as well as the European Union as a supranational organization. City scaping and modern inner architecture will become attuned to these preferences. Firms may work closely with government regulators to adapt to changing trends. Pro-active care for maintaining a healthy workforce and benefits that target the overall long-term well-being of employees including preventive care in teams, will become an essential corporate feature helping employers to attract qualified labor, whose bargaining power increases in the eye of labor shortages, especially in human-facing industries and positions exposed to high levels of personal interaction.

COVID Long Haulers may help trigger an Artificial Intelligence revolution featuring self-monitoring and constant health status tracking. Artificial Intelligence, robotics and big data offer essential complements to fill in for long-haul attention and productivity deficits gaps that may occur in waves. Decentralized healthcare information will undergo democratization as online self-help groups bundle information on individuals' health status and discuss potential remedies free from bribery and corruption or market distortions. This trend will likely put patients and medical professionals on a more equal footing when

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386. Gelter & Puauschunder, *supra* note 16.

387. *Id.*

discussing diagnoses and treatment. Easier access to information will offer a cheaper alternative than seeking out doctors. Decentralized information gathering online with fellow patients will also eliminate the danger of corruption and discrimination in access to medical information. Equal access and online transparency will introduce an even greater level of quality control into the medical profession as already existing. Crowdsourcing of remedy options will also likely extend the overall range of recovery aid options for both preventative and therapeutic healthcare.

At the same time, large-scale online information exchange about medical conditions and potential remedy alternatives are rather novel phenomena and therefore hardly regulated. Online crowdsourcing of information also opens gates to critical biases against those publicizing their health status online, as well as a risk of deception and fraud committed to a highly vulnerable population. Online sharing of sensitive information opens privacy concerns for a vulnerable and impaired group. This necessitates the creation of legal and regulatory frameworks to prevent abuse of online forums for marketing purposes at the expense of the well-being of susceptible patients and impaired individuals in physical and emotional pain or debilitating conditions. Long-term deliberations and hyperbolic discounting should be integrated into academic and political debates in order to protect individuals when innocently sharing medical information and compassionately seeking or extending non-medically trained help.

Generation COVID Long-haul partially being recognized as disabled creates pressure to reform social, healthcare and retirement systems. Given waves of debilitation in a crisis-struck world, in which larger inequality gaps opened, the time for a disparate impact analysis of public policies has come in order to strategically focus rescue and recovery aid. Legal and economic endeavors of the future should establish guidelines for a more diversified reflection of contemporary trends in order to channel governmental rescue and recovery efforts to those in need at the right time. The field of Law and Economics can provide the necessary interdisciplinary viewpoints and synergy potential to evaluate the disparate impact of the crisis and its remedy efforts within society. Public policy recommendations and implementation guidance should particularly emphasize contemporary and anticipated long-haul patterns and trends. In the wake of ambitious bailout and recovery plans, a law and economics view could highlight necessary disparate impact facets of the economic fallouts to a common crisis. The unequally distributed economic gains and losses resulting from the pandemic should become the basis of redistribution efforts. Behavioral economics insights could aid in understanding the socio-economic and psychological disparate impetus of the crisis. Only a diversified analysis with respect to race, age, gender, heritage, wealth, and income brackets allows choosing capital transfer targets strategically. All analysis and redistribution efforts should be driven by fairness mandates and guided with a long-term view in mind.

As for scientific advancements, Generation COVID Long-Haul has the potential to imbue minimalism, rest and recovery as central axioms into a refocused economic calculus. Behavioral insights and leadership theories may inspire economic theory and policy modelling for attention to well-timed minimalism, rest, and recovery. In the scientific community, there is currently a

heightened concern overreaching tipping points and irreversible lock-ins regarding global warming. The direct consequences of climate change, such as severe weather disasters, are additional external stressors for a cohort longing for rest and recovery. Both trends are interconnected and will likely be integrated into holistic preventive medicine models of the future. Healthy nutrition changes resulting in a greening diet that is anti-inflammatory can also help achieve climate goals better than prolonged human physical suffering in the wake of chronic diseases, economic unproductivity of long-term debilitation and ecological overexploitation by enriching groundwater with excessive drug consumption waste. A humane and environmentally-friendly transformation – through the establishment of agro-hood Ecowellness hubs that practice a healthy lifestyle together in a growing community of like-minded individuals will likely continue to thrive in the future. This soft transformation of society could become a more powerful wave than a shock therapy of industry transitioning for the sake of greening the economy that may lead to short-term bottlenecks, unemployment and social frictions on top of taking too long to catch the closing time window to act on climate change.

Regarding healthcare changes, a cadre of chronically debilitated and sick will lead to a drive to alleviate chronic diseases. Already now, the United States Congress approved 1.15 billion USD in funding over four years for the United States National Institute of Health to support research to understand and cure the prolonged health consequences of SARS-CoV-2 infections.<sup>388</sup> Among the symptoms investigated by researchers, chronic fatigue, headaches, shortness of breath and memory fog range among the top mentions of chronic COVID-19 symptoms. By drawing public attention, the prevalence of these symptoms will likely create pressure to find remedies and generate compassion for those affected in society. Immune system related research and attention to the unspecific immune response based on activation levels but also inflammatory malfunctioning in autoimmune diseases will likely gain a greater emphasis in science as well, when considering the current state-of-the-art knowledge on the long-term effects reported by COVID Long Haulers.<sup>389</sup>

Another trend of the post-COVID world that will likely persist is the self-monitoring and self-measurement of body functions. Artificial intelligence support in monitoring and self-testing kits has gained unprecedented momentum in record speed during the COVID pandemic. With the general population partially being concerned about visiting medical facilities as potential virus transmission points and in some cases having particularly asked to stay away from attending a hospital for care during the pandemic, new online consultation revolutions in telemedicine but also online forums have started, which are likely

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388. Francis S. Collins, *NIH Launches New Initiative to Study “Long COVID”*, NAT’L INST. HEALTH (Feb. 23, 2021), <https://www.nih.gov/about-nih/who-we-are/nih-director/statements/nih-launches-new-initiative-study-long-covid> [<https://perma.cc/J6NN-3PYA>].

389. Gina Kolata, *You’re Missing Microbes. But Is ‘Rewilding’ the Way to Get Them Back?*, N.Y. TIMES, <https://www.nytimes.com/2021/07/19/health/human-microbiome-hadza-rewilding.html> [<https://perma.cc/A797-X3A7>] (last updated July 22, 2021).

to be continued after COVID. A wave of Long Haulers following after patients suffering from acute disease will likely continuously exacerbate these trends. In the end, telemedicine can also spread access to affordable healthcare around the world and could become a game changer for international development.

Since the onset of the COVID-19 pandemic, there has been a trend to relocate from large metropolitan areas to more rural ones for the sake of social distancing. In places closer to nature, people have reconnected with the environment during a crucial time in light of climate change. Today, there is a heightened demand for climate stabilization featuring concerted mitigation and adaptation efforts. Creative Ecowellness communities pursuing a sustainable lifestyle may emerge as innovations of our time by paying tribute to health and well-being within the given natural constraints of our ecological limits. Future cities may also see ecological pricing reforms that contribute to the trend toward environmentalism. Active cityscape projects may feature strategies such as forestation or commercial plants to absorb CO<sub>2</sub> from the atmosphere but also behavioral changes.<sup>390</sup> Already now, we can identify a trend towards individualized cars and further behavioral changes will likely force transportation to become more hygienic and individualized.<sup>391</sup> Lastly, the cities of tomorrow will likely feature intergenerational conscientiousness in protecting older and low immune system risk groups from contagious diseases, but also protect COVID long-haul risk groups among middle-aged females.<sup>392</sup>

Corporate settings, industry demands, and economic growth will likely stem from attuning to these Ecowellness trends and sustainable lifestyles in the future. In light of the elevated risk for females to become COVID Long Haulers, employers could voluntarily become more willing to grant females more flexibility for home office workplace solutions and digitalized interaction opportunities, or may be forced to do so by legal action, as they will take into consideration discrimination and long-term risk calculus. All these developments will likely enrich our post-COVID society in a sustainable, healthy, and humane-

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390. João Paulo Braga et al., *It Could Go Like This*, ZEIT (Mar. 10, 2020), [https://www.zeit.de/autoren/B/Joao-Paulo\\_Braga/](https://www.zeit.de/autoren/B/Joao-Paulo_Braga/) [<https://perma.cc/R6KK-Z8NN>]; Nikolaj Skydsgaard, *World's Largest Plant Capturing Carbon From Air Starts in Iceland* (Sept. 8, 2021), <https://www.reuters.com/business/environment/worlds-largest-plant-capturing-carbon-air-starts-iceland-2021-09-08/> [<https://perma.cc/Q6FE-Z9YR>]; Agance France-Presse, *World's Biggest Machine Capturing Carbon from Air Turned on in Iceland*, GUARDIAN (Sept. 8, 2021), <https://www.theguardian.com/environment/2021/sep/09/worlds-biggest-plant-to-turn-carbon-dioxide-into-rock-opens-in-iceland-orca> [<https://perma.cc/MGX9-TSLW>]. See also Steven Mufson, *A Climate Change Solution Slowly Gains Ground*, WASH. POST (Apr. 19, 2019), <https://www.washingtonpost.com/climate-environment/2019/04/19/climate-change-solution-slowly-gains-ground/> [<https://perma.cc/UNV8-M6BZ>]; Ragnhildur Sigurdardottir & Akshat Rathi, *World's Largest Carbon-Sucking Plant Starts Making Tiny Dent in Emissions*, BLOOMBERG (Sept. 8, 2021), <https://www.bloomberg.com/news/features/2021-09-08/inside-the-world-s-largest-direct-carbon-capture-plant> [<https://perma.cc/5XGU-SEWH>].

391. GLAESER & CUTLER, *supra* note 119.

392. PUASCHUNDER, *supra* note 351.

compassionate way.

On a more global macro-economic level, the Green New Deal and European Green Deal as post-COVID-19 recovery paths forward include sustainability pledges. A sustainable finance taxonomy may also innovatively include healthcare reforms and governmental funding of long-term health pledges in order to cater to a wave of COVID-19 Long Haulers. Attention to the integration of Artificial Intelligence into healthcare and medicine should be coupled with the insights of a cadre of those periodically suffering from long-haul symptoms. Novel technologies come in handy in particular for those who wish to track their health in real time and those who have unstable conditions and are facing waves of symptoms and recurring disability. Artificial Intelligence could be integrated to provide support when patients face difficulty that may set on unpredictably and/or periodically. Human-Artificial Intelligence compatibility will be key in navigating obscure symptoms and complex waves of multi-organ functionality deficiencies. Big data insights will enable researchers and physicians to find patterns and clusters in waves of complex symptoms.

In the future, the 21<sup>st</sup> century may well come to be seen as an unprecedented time of anti-economics that valued everything contrary to the neoclassic idea of economics of productivity, maximization, and efficiency. With this generation of COVID-19 Long Haulers, who are around a median age in their 30s, 40s and 50s, a dramatic shift in demand for health, minimalism and rest is predicted to emerge. In particular COVID Long Haulers appear to have a preference for unwinding speed and avoiding mental overload. While standard neoclassical economic theory is based on the belief that efficiency maximization stemming from productivity gains and activation level increases is the ultimate preference of all individuals, COVID Long Haulers may develop – for the first time in economic history – a large-scale demand for attention to disability, rest and relaxation and thereby drive a trend of the economics of unwinding into slowness.

In a generation of COVID-19 Long Haulers, a dramatic demand for health, minimalism and rest is predicted to emerge. Maximization of productivity driven industries in business, finance and economics do not account for minimalism. There is little appreciation for rest in finance and economics. Foremost, behavioral economics started to address cognitive overload and decision-making failures in a too complex world for the human mind bound by cognitive overload. Behavioral health efforts could address these trends of attention to health, minimalism and rest and cooperate with the COVID-19 Long Haulers generation that may change society lastingly.

Legal professionals will address issues resulting from the presence of a growing cohort of long-haul sufferers in the workforce. Drawing from behavioral insights, the laws of human productivity after rest will have to be better understood. The same is true for differences in time discounting over life stages. The role of critical life events of a COVID infection to lastingly change life perspectives and decision making will need to be better understood and more accurately described by sciences investigating the family, the workforce but also economic variables. With Long Haulers facing trends of changing health conditions, novel workforce uncertainty will become a topic of discussion for corporate governance and business contingency planning. Flexibility and

compassion will likely become the essential leadership qualifications in tomorrow's workplace, in which Long Haulers are prone to face fast-paced symptoms and work capability changes. The newly imposed obligation of corporations to ensure a healthy work environment will likely remain in place after the pandemic and will be coupled with certain rights of employers to monitor and track the health status of the workforce as well as force vaccination and other prevention and precaution mandates upon workers. Corporate management will have to become attuned to the health situation of employees and will likely divide capital into artificial intelligence and a more unpredictable human workforce with an appreciation for rest and relaxation. New activation studies will be needed and will have to be guided by behavioral specialists that identify the right balance between work and rest. These studies will likely be inspired by activation research such as the Yerkes-Dodson law, which predicts the individual activation level.<sup>393</sup> Similar research could capture the overall immune system status to determine individual potentials and avoid overstimulation of the immune response leading to potential work deficiencies and quality of life impairments after a COVID infection.

All these trends in the economics of unwinding, relaxation and rest will likely become major drivers of a new revolution in economics that shifts attention away from profit maximization, productivity, and speed to focus on minimalism, relaxation and rest. Previously avoidable states of rest, inaction and unproductivity that were deemed as problematic will be seen as a desired luxury outcome. The maximization of minimalism is likely to become a trend that will change the way society produces, consumes, and gratifies. Artificial Intelligence and robotics could keep an economic growth level while human beings start focusing on relaxation and letting go. Legal scholarship can add to this trend in carving out the borderlines of rest and recovery and establishing social norms in workspaces and protect from discrimination of resting individuals, but also in other contexts, such as public spaces, public transportation, and commercial settings. Space for individualized healthcare monitoring and testing has already been demanded and will likely continue to gain further attention as we recover from the pandemic with a growing population that will need to engage in continuous healthcare status tracking.

In view of the long-term effects of the Coronavirus crisis and the growing climate change threats, a change in values will likely take place in the course of a modern renaissance that tackles the crisis of our lifestyles – if humans feel they have become detached from the environment and in light of our recovering bodies and fellow human longing for long-haul rest and recovery.

The interdisciplinary field of Law and Economics is predestined to play a pioneering role in the governance of changing societal values that can bring about an improvement in social and cultural prosperity via the detour of a global crisis. Law and Economics of the future can harness a mental rebirth based on novel and exciting opportunities and positive societal advancements that come out of the

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393. See Robert M. Yerkes & John D. Dodson, *The Relation of Strength of Stimulus to Rapidity of Habit Formation*, 18 J. COMPAR. NEUROLOGY & PSYCH. 459 (1908).

crisis – such as preventive medical care, reconnection with nature but also digitalization perks and governance for all in the restructuring of financial markets and social welfare benefits. Behavioral changes could include Behavioral Law and Economics leadership in ‘nudges’ and ‘winks’ towards environmentally and intergenerationally-conscientiousness as easily-implementable sources to educate and change people’s choices for betterment without direct enforcement.<sup>394</sup> All these developments structured by Law and Economics expertise can become the ultimately fundamental high culture revitalization that our common world recovering from the largest-ever external shock with long-haul impetus deserves.

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394. PUASCHUNDER, *supra* note 240.