

*Editorial*

# Rethinking Innovation and Development Discourses in the Light of COVID-19

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The COVID-19 pandemic has cast new light on worldwide socioeconomic susceptibility to exogenous shocks. This crisis has been framed unlike any other in modern memory (Schwab & Malleret, 2020). The virus was initially thought to be a mild outbreak in Wuhan, China, in December 2019 but soon spread to 216 countries (Ke & Hsiao, 2021). The World Health Organisation's (WHO) Covid dashboard indicated 540,923,532 confirmed cases of COVID-19 as of June 27, 2022, resulting in 6,325,785 deaths globally. WHO declared the virus a global health emergency as it quickly moved beyond China. The United Nations Secretary—General Antonio Guterres stated that the pandemic is responsible for the largest economic catastrophe and highest unemployment since the Great Depression; COVID-19 has also endangered human rights (Ke & Hsiao, 2021). Yet, these circumstances are not exactly unprecedented. Jordà et al. (2020) investigated pandemics dating back to the 14th century and identified considerable negative macroeconomic repercussions as outbreaks persisted for decades. Some economists have contended that this pandemic will lead to severe economic crises (Gans, 2020) as well. Subsequent studies (e.g., Jordà et al., 2020) similarly suggested that COVID-19 will have enduring consequences on the world's economy, such as considerably lower return rates, with no nation escaping untouched. Susskind and Vines (2020) pointed out that this pandemic has triggered the most severe global economic consequences since the South Sea Bubble burst in 1720. Indeed, a World Bank analysis showed that COVID-19 caused economic activity to fall in nearly 90% of countries in 2020—exceeding the proportion of nations that saw similar declines during the Great Depression in the 1930s and the two world wars combined. Global economic contraction of almost 3% and a generation-first rise in poverty followed the first year of this outbreak (World Bank, 2022). Overall, the pandemic has brought attention to capitalism's drawbacks and demonstrated how favouring profit above people may be fatal (Shang et al., 2021; Yunus, 2020).

In addition to sparking a socioeconomic crisis, COVID-19 has exposed innovation systems' vulnerabilities as evidenced by innovation obstacles (Chesbrough, 2020) and overdependence on conventional approaches. More than two years after the pandemic's emergence, global citizens continue to grapple with adverse economic and health-related effects (Sohrabi et al., 2020; Zakaria, 2020). The virus has unveiled deep flaws in global public health infrastructure (Brands & Gavin, 2020). Nearly, all governments are navigating the ramifications of this pandemic. A series of revelatory reports on COVID-19 have shown that its damage has exceeded expectations (Naidoo & Fisher, 2020; Zakaria, 2020). Further complicating

governments' fight against COVID-19 are racial injustice, climate change and economic inequality (Henderson, 2020; Mazzucato, 2021).

Amid these health, political and economic concerns (Rowan & Galanakis, 2020), COVID-19—similar to prior crises—has renewed debate around the dominant narrative across innovation and development discourses. Inherent tensions accompanying the prevailing producer's innovation paradigm (Christensen et al., 2019; von Hippel, 2016) have become especially pronounced. The ruling economic system of capitalism has also come under fire (Henderson, 2020; Yunus, 2018). Mazzucato (2021) asserted that COVID-19 has illuminated cracks in capitalism as well as its pitfalls. She noted that there is no better time than now to rectify these issues—but that it will only be possible to do so by reimagining governments' roles, policies and capitalism at large. Meanwhile, among critiques of existing growth and innovation models, many Nobel prize-winning economists have drawn hope from COVID-19. They believe that the pandemic has opened a window of opportunity to explore alternative innovation and growth models, even warning that returning to old models could be 'equal to committing suicide' (Yunus, 2020).

People were advocating for revamped innovation and development models well before COVID-19. The environmental crises, institutional collapses, middle-income traps, stagflation and wealth inequality that emerged in the wake of the 2008 recession ignited worries about common innovation and growth models (Gordon, 2016; Heeks et al., 2014; Piketty & Goldhammer, 2017; Santiago, 2014). Jacobs and Mazzucato (2016) claimed that inequality has reached a peak unseen since the 1800s. Productivity-enhancing innovation has lessened as well (Gordon, 2016). Climate change and health crises such as COVID-19 continue to threaten global prosperity (Henderson, 2020; Mazzucato, 2021). So-called 'degenerative industrial activity' based on a linear industrial system has decimated natural cycles and siphoned natural resources (Raworth, 2017). Against this dark backdrop, financial greed from material through-flow has corroded intelligent, local, non-compensated and sustainable innovation (Raworth, 2017).

Given these deficiencies, innovation and development models deserve renewed attention (Bhaduri, 2016; Bhatti et al., 2018; Krishna, 2017; Mazzucato, 2021; Phelps, 2013; UNCTAD, 2017; von Hippel, 2016; Sheikh & Bhaduri, 2021). Scholars have advocated for recasting growth models such that externalities are primed to mitigate dysfunction (Henderson, 2020; Wu, 2020; Yunus, 2018). Researchers have also called for redirecting innovation models to tackle failures (Prahalad & Mashelkar, 2010; Ventresca & Nicholls, 2011). A global consensus around a sustainable future is coming forth, with experts recommending the use of hybrid models of innovation to address poverty, inequality and climate change (Sachs, 2020; UNCTAD, 2017). The demand for more democratised models of innovation, which can ensure sustainability and involve grassroots thinking, is growing in kind (von Hippel, 2005; Godin et al., 2021; Godin & Vinck, 2017). Experts such as Jeffrey Sachs have encouraged 'compassionate innovation models.' Others have said that post-COVID-19 'development must have a radically transformative, egalitarian and inclusive knowledge and politics at its core' (Leach et al., 2021). The traditional 'top down, rigid and oriented towards narrowly-defined economic goals' development model should be avoided.

Dominant innovation models, which have been compared to modern-day religion because of how deeply this issue has permeated intellectual and policy circles, have given rise to several competing models due to their 'exclusion consequences' (Laurent, 2021). A rich body of work on alternative innovation theories has thus started to take shape (Godin et al., 2021). Research is moving beyond high technology, the concept of winners and losers, and radical technological advancements. Instead, it is directing attention towards emerging subjects such as the 'democratization of innovation' (von Hippel, 2005), the recognition of 'open innovation' (Gassmann et al., 2010), 'norm critical innovation' (Börjesson et al., 2016), the exploration of the 'dark side of innovation' (Coad et al., 2020), and the negative outcomes it may bring (Biggi & Giuliani, 2020). Scholars have challenged the idea of innovation as a primarily urban affair, illustrating how

innovation happens in peripheral places—albeit sometimes differently than usual (e.g., Grillitsch & Nilsson, 2017; Martinus et al., 2020; Melançon & Doloreux, 2013).

An argument that innovation should be societal, environmental and ethical is gaining traction (Godin et al., 2021; Laurent, 2021). The ‘collateral damage’ from existing models has shown the underbelly of start-up culture, namely in terms of ecological costs and potential adverse impacts on labour structures and social justice (Laurent, 2021). Suggestions for incorporating future effects and social groupings into innovation models by investigating innovation pathways and peripheries are also coming to the fore (Fagerberg et al., 2013). Some ‘reformists’ have commented on the gendered and discriminatory aspects of contemporary innovation models. They suggest that women and people of colour should be represented in new methods. Prevailing innovation models possess an exclusionary character and can lead to environmental problems. They can additionally hinder growth and accelerate stagflation. The 2006 Nobel prize winner in economics, Edmund Phelps, stated that a chief way to combat these issues is to ‘rekindle innovation’ (Phelps, 2013). He proposed nurturing grassroots dynamism and widespread indigenous innovation for mass flourishing.

Just as the pandemic has revealed the ‘fault lines of the world—most notably social divides, [a] lack of fairness, absence of cooperation, [and] failure of global governance and leadership,’ and also it has highlighted the room for transformation. Reinvention is essential if practitioners wish to thoroughly address global challenges (Schwab & Malleret, 2020). Problems such as excessive institutional reliance on superspecialisation and data-based decisions also call for innovation. Ideas that encourage adaptability and experimentation can have far-reaching benefits (Bhaduri & Knorrinda, 2020). Red tape, bureaucracy and government overreach are thought to inhibit innovation, but this attitude is changing—many have argued that public policy and government support are integral to a hopeful future. Weiss (2021) even contended that the government possesses the entrepreneurial spirit necessary to transform the public sector’s responses to both major and minor problems.

The pandemic has compelled healthcare ecosystems to rethink their global strategies, moving from resilience to anti-fragility (Cobianchi et al., 2020). Seemingly countless modern technologies have flourished in response to COVID-19 (e.g., 3D printing, flexible manufacturing systems, big data analytics and smart healthcare wearables) (Brem et al., 2021). In a similar vein, telehealth has led in-person clinical visits to be partly replaced by virtual consultations (Woolliscroft, 2020). Bottom-up entrepreneurship featuring homegrown efforts to crowdsource innovations has spurred creative collaborations (Ramadi & Nguyen, 2021). Digital technologies are being harnessed to support public health responses to COVID-19 (Budd et al., 2020). Frugal innovations (Harris et al., 2020) represent a bright spot. Rapidly reusing, repurposing and recombining available resources and knowledge constitute a prominent innovation strategy (Harris et al., 2020). However, even as cutting-edge technologies such as robots, biotechnology and artificial intelligence show tremendous potential for sustainable growth, they may widen the digital gap between people with and without access to technology. The COVID-19 pandemic has underlined this disparity. Although technology is imperative to curbing the virus’s spread, not everyone has equal access to such benefits (UNTAD, 2021).

The pandemic has also breathed new life into national innovation plans and expedited related interventions. Governments have begun promoting local and international cooperation and imploring start-ups and other companies to fast-track promising mitigation measures (OECD, 2020). Open-source circular economy movements by innovators, designers and activists are also being pursued to create regenerative economies (Raworth, 2017). Even healthcare organisations in advanced countries such as the United States are learning from Asia and Africa in the fight against the pandemic, revealing a trend of reverse innovation from less to more developed economies (Ramamurti, 2020). Innovation policy is evolving dramatically. Economic growth is no longer considered the sole means of stimulating technological development, solving

concrete and pressing societal problems dominates the innovation policy discourse (Wieczorek & Hekkert, 2012).

In the wake of the pandemic and other global challenges, this special issue empirically explores innovation, development and relevant policy for a post-COVID-19 world. The objective of this special issue is to identify the guiding principles of government innovation and development policy to overcome emergent obstacles. We sought papers that highlight why it is necessary to recast prevailing innovation and development discourses and that recommend inclusive and sustainable alternatives. This special issue explores under-researched areas of innovation policy; alternative, equitable, sustainable and inclusive development and innovation pathways. Papers delineating the roles of alternative innovation models and secondary innovations amid COVID-19 are included. Conceptual papers and provocative essays offering new perspectives on the roles of governments and mission-oriented innovation policy in combatting crises such as COVID-19 are featured as well. This collection comprises five full-length papers, a guest column by Prof. Muhammad Yunus, Nobel Laureate 2006 and a detailed think piece by Prof. Bengt-Åke Lundvall.

This special issue opens with Prof. Yunus's column entitled 'Rethinking Innovations and Growth Models in Post-Covid World,' which features a passionate appeal to abandon what he calls a 'suicidal path' by blindly following the current economic system. He is of the opinion that the pandemic has brought out the worse in today's economic system. If not redesigned urgently, he says, this system will lead the world to extinction. He states that the only answer is to boldly reverse existing economic models. 'Our house is burning but we are busy partying inside the burning house without making any efforts to stop the fire,' he maintains. The pandemic has uncovered weaknesses in modern systems and has unmasked human selfishness. He argues that the 'global village' does not exist and flags the 'cruellest face' of 'vaccine apartheid', when vaccines were made available to a mere 10 countries. He also cites the need to make the vaccines 'patent-free,' so they can be produced globally to reach all people. He closes by stating that COVID-19 has granted the world an opportunity to abandon the old framework and divert from this suicidal path and it is time to rethink both economic and innovation models.

Next, Prof. Lundvall's think piece 'The Covid19-crisis, National Innovation Systems and World Development' calls for a global innovation system. He says that while the ongoing pandemic has proven the value of science and technology in addressing a pressing issue, it has revealed these industries' limitations and the lack of more established institutions and organisational capabilities. COVID-19 has particularly emphasised the need for stronger innovation systems in the South. It has additionally shown the importance of moving beyond national governance towards a global innovation system. Prof. Lundvall argues that this crisis has strengthened technological and competitive developments that call into question the assumptions of innovation system theory and innovation policy. Attention is directed to artificial intelligence and digital innovation as well as the concentration of intellectual capital within a small number of information technology behemoths in the United States and China. Along with undermining international scientific and technological collaboration, these developments have amplified intercountry competition. To foster critical digital competencies and competitiveness, Prof. Lundvall contends that small- and medium-sized countries must integrate economically and politically. He believes that such actions will aid in the establishment of international innovation systems.

At a time when the introduction of new technologies has put pressure on international technological cooperation, the world has witnessed the rise of open and bottom-up innovations driven by an open ethos, frugality and international collaboration. This trend is thought to offer a viable solution to current circumstances. Soumodip Sarkar and Sara Mateus's paper 'COVID-19 and Rapid Response in Healthcare: Enacting Bricolage to Overcome Resource Constraints' puts forth the notion of 'crisis-driven bricolage' in healthcare to capture the nuances of alternative innovations. A qualitative synthesis of 19 examples from developing nations presents innovative solutions. The authors argue that when resources are limited and

swift reactions are required, bricolage might offer a workable approach. They recommend attending more closely to bricolage to deliver affordable, effective solutions while expanding society's innovation toolkit.

Zhigang Fan, Xuanshun Zhai and Dong Wu's article 'Exploring the Roles of Social Networks and Absorptive Capacity in Local Firms' Strategic Flexibility: An Empirical Investigation of Chinese Firms' explores Chinese firms' strategic flexibility in recovering from COVID-19 shocks. This pandemic has devastated global production networks, and many firms have vanished; however, some firms have managed to recover quickly. The authors elucidate such recovery in three respects: by discussing strategic flexibility, investigating the roles of social networks and absorptive capacity and analysing a sample of 276 local manufacturers embedded in global production networks.

This study is followed by Dong Wu, Tanfei Liu and Wen Yang entitled 'Knowledge Coupling and Organizational Resilience: The Moderating Effect of Market Orientation.' They examined more than 359 Chinese manufacturing firms to understand organisational resilience during crises such as COVID-19. Results show that complementary knowledge coupling and substitutive knowledge coupling can both promote organisational resilience, given that the moderating effects of proactive and responsive market orientations differ. The authors find that a proactive market orientation positively moderates the effects of complementary knowledge coupling and substitutive knowledge coupling on organisational resilience, whereas a responsive market orientation negatively moderates the impact of complementary knowledge coupling on organisational resilience. This empirical study contributes to the literature on organisational resilience and can help firms find new ways to cope with crises.

Further, Yasser Ahmad Bhatti et al.'s article 'Digital healthcare innovation and development in Saudi Arabia during and beyond COVID-19' concentrates on Saudi Arabia, the largest nation in the Arabian Gulf. They investigate rapid adoption of new technologies to alleviate the COVID-19 crisis. Their work explains how the Saudi Ministry of Health has implemented innovations to revolutionise healthcare planning, management and delivery; few studies have considered the dynamics of innovation systems in the Gulf. The authors also provide a roadmap and recommendations to maintain the innovation system's growth momentum post-pandemic. Sustaining this system is expected to have long-lasting benefits for healthcare.

This special issue concludes with Ogundiran Soumonni and Mammo Muchie's article, 'Endogenous Knowledge and Secondary Innovation in the Age of COVID-19: A Global South Civilisational Dialogue.' With a focus on secondary innovations, the authors argue in favour of mechanisms for innovation in the Global South. They contend that creativity should be rooted in civilisations' illustrious histories. They also assert that the theoretical concept of secondary innovation—born of Chinese efforts around economic catch-up; endogenous development, which seeks to ground Africa's advancement in its historical antecedents; and grassroots innovation from the Indian subcontinent—should guide the South–South dialogical exchange. They then devise a conceptual framework for endogenous innovation that is contextually dependent to shape socially transformative initiatives.

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## **References**

Bhaduri S., & Knorringa P. (2020). COVID-19: Should Europe embrace frugality? <https://www.iss.nl/en/news/covid-19-should-europe-embrace-frugality>. <https://www.iss.nl/en/news/covid-19-should-europe-embrace-frugality>

- Bhaduri S. (2016). Frugal innovation by 'the Small and the Marginal': An alternative discourse on innovation and development. In: *Inaugural lecture prince clause chair in development and equity*. Netherlands, Erasmus University Rotterdam.
- Bhatti Y., Basu R. R., Barron D., & Ventresca M. J. (2018). Frugal Innovation In: *New models of innovation and theoretical development*. Cambridge University Press.
- Biggi G., & Giuliani E. (2020). The noxious consequences of innovation: What do we know? *Industry and Innovation*, 28(1), 19–41. Crossref
- Börjesson E., Isaksson A., Ilstedt S., & Ehrnberger K. (2016). Visualizing gender–norm-critical design and innovation. In: Alsos G. A., Hytti U., & Ljunggren E. (Eds.), *Research handbook on gender and innovation* (pp. 252-274). Edward Elgar Publishing.
- Brands H., & Gavin F. J. (2020). *COVID-19 and world order: The future of conflict, competition, and cooperation*. JHUP.
- Brem A., Viardot E., & Nylund P. A. (2021). Implications of the coronavirus (COVID-19) outbreak for innovation: Which technologies will improve our lives? *Technological Forecasting and Social Change*, 163, 120451.
- Budd J., Miller B. S., Manning E. M., Lampos V., Zhuang M., Edelstein M., Rees G., Emery V. C., Stevens M. M., Keegan N., Short M. J., Pillay D., Manley E., Cox I. J., Heymann D., Johnson A. M., & Mckendry R. A. (2020). Digital technologies in the public-health response to COVID-19. *Nature Medicine*, 26, 1183–1192.
- Chesbrough H. (2020). To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. *Industrial Marketing Management*, 88, 410–413
- Christensen C. M., Ojomo E., & Dillon K. (2019). *The prosperity paradox: How innovation can lift nations out of poverty* (Illustrated ed.). Harper Business.
- Coad A., Nightingale P., Stilgoe J., & Vezzani A. (2020). Editorial: The dark side of innovation. *Industry and Innovation*, 28(1), 102–112. Crossref
- Cobianchi L., Dal Mas F., Peloso A., Pugliese L., Massaro M., Bagnoli C., & Angelos P. (2020). Planning the full recovery phase. *Annals of Surgery*, 272(6), e296–e299.
- Fagerberg J., Martin B. R., & Andersen E. S. (2013). *Innovation studies: Evolution and future challenges*. Oxford University Press.
- Gans J. (2020). *Economics in the Age of COVID-19*. The MIT Press.
- Gassmann O., Enkel E., & Chesbrough H. (2010). The future of open innovation. *R&D Management*, 40(3), 213–221
- Godin B., & Vinck D. (2017). *Critical studies of innovation: Alternative approaches to the pro-innovation bias*, Cheltenham, UK: Edward Elgar Publishing.
- Godin B., Gaglio G., & Vinck D. (2021). *Handbook on alternative theories of innovation*. Edward Elgar Publishing.
- Gordon R. J. (2016). *The rise and fall of American growth: The U.S. standard of living since the Civil War*, Princeton, NJ: Princeton University Press
- Grillitsch M., & Nilsson M. (2017). Firm performance in the periphery: On the relation between firm-internal knowledge and local knowledge spillovers. *Regional Studies*, 51(8), 1219-1231.
- Harris M., Bhatti Y., Buckley J., & Sharma D. (2020). Fast and frugal innovations in response to the COVID-19 pandemic. *Nature Medicine*, 26(6), 814-817.
- Heeks R., Foster C., & Nugroho Y. (2014). New models of inclusive innovation for development. *Innovation and Development*, 4(2), 175–185.
- Henderson R. (2020). *Reimagining capitalism in a world on fire* (Illustrated ed.). PublicAffairs.
- von Hippel E. (2005). *Democratizing innovation: The evolving phenomenon of user innovation*. MIT Press.
- von Hippel E. (2016). *Free innovation* (1st ed.). MIT Press.
- Jacobs M., & Mazzucato M. (2016). *Rethinking capitalism: Economics and policy for sustainable and inclusive growth* (Political Quarterly Monograph Series) (1st ed.). Wiley-Blackwell.
- Jordà O., Singh S. R., & Taylor A. M. (2020). *Longer-run economic consequences of pandemics* (NBER Working Paper

No. 26934).

- Ke X., & Hsiao C. (2021). Economic impact of the most drastic lockdown during COVID-19 pandemic—The experience of Hubei, China. *Journal of Applied Econometrics*, 37(1), 187–209.
- Krishna V. (2017). *Universities in the National innovation systems: Experiences from the Asia-Pacific* (1st ed.). Routledge India.
- Laurent B. (2021). Ideology, engine or regime. Styles of critique and theories of innovation. In Godin B., Gaglio G., & Vinck D. (Eds.), *Handbook on alternative theories of innovation* (pp. 369-386). Edward Elgar Publishing.
- Leach M., MacGregor H., Scoones I., & Wilkinson A. (2021). Post-pandemic transformations: How and why COVID-19 requires us to rethink development. *World Development*, 138, 105233. Crossref
- Martinus K., Suzuki J., & Bossaghzadeh S. (2020). Agglomeration economies, interregional commuting and innovation in the peripheries. *Regional Studies*, 54(6), 776-788.
- Mazzucato M. (2021). *Mission economy: A moonshot guide to changing capitalism*. Harper Business.
- Melançon Y., & Doloreux D. (2013). Developing a knowledge infrastructure to foster regional innovation in the periphery: A study from Quebec's coastal region in Canada. *Regional Studies*, 47(9), 1555-1572.
- Naidoo R., & Fisher B. (2020). Reset sustainable development goals for a pandemic world. *Nature*, 583(7815), 198–201.
- Phelps E., (2013). *Mass flourishing: How grassroots innovation created jobs, challenges, and change*. Princeton University Press, USA.
- Piketty T., & Goldhammer A. (2017). *Capital in the Twenty-First Century* (Reprint ed.). Belknap Press: An Imprint of Harvard University Press.
- Prahalad C. K., & Mashelkar R. A. (2010). *Innovation's holy grail*. Harvard Business Review: July–August.
- Ramadi K. B., & Nguyen F. T. (2021). Rapid crowdsourced innovation for COVID-19 response and economic growth. *npj Digital Medicine*, 4, 18.
- Ramamurti R. (2020). *Using reverse innovation to fight Covid-19*. Harvard Business Review. <https://hbr.org/2020/06/using-reverse-innovation-to-fight-covid-19>
- Raworth K. (2017). *Doughnut economics: Seven ways to think like a 21st-Century economist* (Illustrated ed.). Chelsea Green Publishing.
- Rowan N. J., & Galanakis C. M. (2020). Unlocking challenges and opportunities presented by COVID-19 pandemic for cross-cutting disruption in agri-food and green deal innovations: Quo Vadis? *Science of The Total Environment*, 748, 141362.
- Sachs J. D. (2020). *The ages of globalization: Geography, technology, and institutions*. Columbia University Press.
- Santiago F. (2014). Innovation for inclusive development. *Innovation and Development*, 4(1), 1–4.
- Schwab K., & Malleret T. (2020). *COVID-19: The great reset*. ISBN Agentur Schweiz.
- Shang Y., Li H., & Zhang R. (2021). Effects of pandemic outbreak on economies: Evidence from business history context. *Frontiers in Public Health*, 9.
- Sheikh F. A., & Bhaduri S. (2021). Policy space for informal sector grassroots innovations: Towards a 'bottom-up' narrative. *International Development Planning Review*, 43(1), 115–137.
- Sohrabi C., Alsafi Z., O'Neill N., Khan M., Kerwan A., Al-Jabir A., Iosifidis C., & Agha R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *International Journal of Surgery*, 76, 71–76.
- Susskind D., & Vines D. (2020). The economics of the COVID-19 pandemic: An assessment. *Oxford Review of Economic Policy*, 36(Supplement\_1), S1–S13.
- UNCTAD. (2017). *New innovation approaches to support the implementation of the sustainable development goals*.
- UNTAD. 2021, *Technology and innovation report 2021: Catching technological waves innovation with equity*. New York, United Nations.
- Ventresca M., & Nicholls A., (2011). *Rethinking business course*. Oxford: Said Sch.

- Weiss M. (2021). *We the possibility: Harnessing public entrepreneurship to solve our most urgent problems*. Harvard Business Review Press.
- Wieczorek A. J., & Hekkert M. P. (2012). Systemic instruments for systemic innovation problems: A framework for policy makers and innovation scholars. *Science and Public Policy*, 39(1), 74–87.
- Woolliscroft J. O. (2020). Innovation in response to the COVID-19 pandemic crisis. *Academic Medicine*, 95(8), 1140–1142.
- World Bank. (2022). *World Development Report 2022: Finance for an equitable recovery*. Washington, DC: World Bank. DOI:10.1596/978-1-4648-1730-4.
- Wu X. (2020). *Global manufacturing and secondary innovation in China: Latecomer's advantages* (series on innovation and operations management for Chinese enterprises book 6). China: World Scientific / Zhejiang University Press.
- Yunus M. (2018). *A world of three zeros: The new economics of zero poverty, zero unemployment, and zero net carbon emissions* (Reprint ed.). PublicAffairs.
- Yunus M. (2020). *Going back to that world is equal to committing suicide. - Professor Muhammad Yunus on the opportunity presented by COVID-19*. Yunus Social Business. <https://www.yunussb.com/blog/2020/5/20/professor-muhammad-yunus-opportunity-covid-19>
- Zakaria F. (2020). *Ten lessons for a post-pandemic world* (1st ed.). W. W. Norton & Company.