

The COVID-19 Crisis and Its Implications for Economic Policy

Arkebe Oqubay

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DSI/NRF SOUTH AFRICAN RESEARCH CHAIR IN INDUSTRIAL DEVELOPMENT

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Abstract

The COVID-19 pandemic is not only a public health crisis, but also a complex global economic crisis with a profound socio-economic effect unprecedented since the Spanish flu. Unlike the 2008 global financial and economic crisis, the current economic recession is interlocked with a public health emergency at a time of weak multilateral collaboration, which has exposed the vulnerability of the world economic system. The pandemic has also revealed vast differences in government policy responses, highlighting differentiated industrial policies and developmental roles of governments. In contrast to the last major global economic crisis, most governments in developed and developing economies are pursuing expansionary economic stimulus to accelerate economic recovery and develop productive transformation (including green transformation). This paper focuses on key lessons that have implications for economic policy: First, it points to the uneven effects of the crisis and analyses the responses of various governments and the subsequent unbalanced economic recovery, with a specific focus on stimulus packages and their implications for economic policies in developing countries. Second, it suggests that governments with industrial capacities and industrial policy experience have been better positioned to translate industrial capability into an appropriate public health emergency response and productive transformation. Third, it explores the most effective pathway to sustained recovery and will argue that productive transformation requires robust global collaboration.

Keywords: COVID-19 pandemic, industrial capacity, economic policy, economic recovery, government, productive transformation, developing countries.

JEL codes: F13, F68, J21, L50, L52, L78, O14, O25

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1. COVID-19: Unprecedented Crisis of a Global Magnitude

The COVID-19 pandemic has presented extraordinary challenges because of the virus's exponential transmission that spread in an increasingly interconnected world. The scientific community's current understanding of the nature of the pandemic is incomplete, compounded by new mutations and variants and due to the dynamic nature of the pandemic. Unlike SARS, Ebola and MERS, which had national and regional dimensions, COVID-19 has engulfed all continents and countries, infecting over 300 million people. A total of 5.5 million deaths were reported by early January 2022. COVID-19 infections continue to rise steeply, despite extensive vaccination – over ten billion vaccines by January 2022, although uneven distribution of vaccines has been observed in developing countries.

Moreover, effective therapeutics have not yet been discovered and rolled out globally at a low cost. There is inadequate understanding and scientific knowledge, and it is not yet clear whether new post-Omicron waves will occur, or whether the surge is over and evolving from pandemic to endemic. Nevertheless, some scientists have cautious optimism that Omicron's patterns may be the light at the end of the tunnel towards the gradual end of the COVID-19 pandemic.

The COVID-19 pandemic is not only a public health crisis, however, but also a complex global socio-economic crisis of a kind not seen in the last 100 years. Unlike the 2008 global financial and economic crisis, the current economic crisis is interlocked with a public health emergency at a time of weak multilateral collaboration, making it the most complex and damaging crisis to hit the world in living memory and exposing the vulnerability of the economic system. The economic crisis has overwhelmed advanced, emerging and developing economies alike and has brought forth short-, medium- and long-term consequences and disproportionate sectoral effects. A dramatic shrinkage in the growth of advanced economies is predicted, together with the slowest growth in China's economy in decades and domestic shock and economic turmoil in emerging and developing economies. The IMF and the World Bank have reported a fall in global GDP of some 5.2 per cent (as a baseline forecast, around which there continues to be high uncertainty) (IMF 2021; World Bank 2020). By early 2022, the outlook of the COVID-19 crisis remains unclear, and no one can predict with certainty the outcome of economic recovery.

COVID-19 is an all-time reminder that pandemics can quickly wipe out the economic gains of decades. The COVID-19 outbreak has also proven to be very complex, given its multidimensional aspects – public health emergency, economic recession, socio-political crisis, and geopolitical tensions. Tooze (2021) highlights that, “[i]n a new and remarkable fashion, a medical challenge became a much wider crisis”. The unpredicted global economic recession has affected both advanced and developing countries when growth was needed in the sluggish post-2008 global financial crisis, and when achieving the SDGs had become vital.

Moreover, the difficulty of measuring the long-term and multidimensional effects of such outbreaks makes the global economy increasingly more vulnerable than ever.

To mitigate the effects of the pandemic, governments across countries have responded by introducing a series of measures, including lockdowns and closing international borders. Some of the policy choices have attracted criticism from leading epidemiologists. For example, in his book, *The Year the World Went Mad: A Scientific Memoir*, Professor Mark Woolhouse (2022) of Edinburgh University presents an alternative perspective, arguing that lockdown was unnecessary and that a targeted approach to protecting the most vulnerable would have been more effective. In Sweden, the government avoided strict lockdown, pursuing voluntary behaviour changes that have arguably been successful: the country's economy is forecast to improve in 2022 (Standage 2021). In a November 2021 government-organised referendum, in a typically Swiss exemplar of direct democracy, Switzerland rejected the abolition of the COVID vaccination pass and prolonged restrictions (Foulkes 2021).

On 11 December 2021, *The Economist* published an article about the Netherlands lagging in the COVID booster vaccination programme. The article highlighted "the Dutch culture of governing via exhaustive negotiations and consensus – a system known as the 'polder model'" (The Economist 2021). This opinion represents the conventional view that a 'one-size-fits-all' response – vaccinations, lockdowns, economic stimulus, international travel bans – is the standard menu for fighting the virus and controlling the pandemic. However, standard prescriptions do not work, as national contexts differ starkly across regions and countries, and also within countries. The constantly changing COVID-19 situation and its interaction with the domestic and external environment must be considered. Governments therefore need to respond to the crisis with policies and measures that reflect their specificities.

The response to COVID-19 has been highly polarised due to the different political views of different interest groups, compounded by the lack of complete scientific understanding of the pandemic and precarious global collaboration. Some governments and giant pharmaceutical corporations promoted vaccinations as an exclusive 'silver bullet' for the pandemic, driven by profit maximisation. Many governments introduced populist actions despite pursuing the most effective measures based on scientific evidence. Response to the pandemic became the dominant agenda in many countries during national elections. COVID-19 became a showcase for international influence, while commitment and global collaboration diminished further. The typical tendency has been to follow the conventional approach rather than policy innovations adapted to specific contexts.

The controversy around the Omicron variant in November 2021 was clear evidence that responses by governments were highly politicised and arguably discriminatory. Many governments, including the USA and those in Europe, panicked and took hasty and unjustified decisions, banning international travel from Southern African countries. This was sustained for some time, even after discovering the variant in Europe and the USA. Fortunately, South Africa passed the peak by the end of December and, to the relief of South Africans, without a

national lockdown, which would have hit the economy badly. All variants were different; likewise, public health pressures varied (Henley 2020).

Section 2 below presents the unevenness in the COVID-19 pandemic and responses, while Section 3 reviews the implications for economic policies, followed by an analysis of public health approaches to COVID-19 in Section 4. Section 5 focuses on building global collaboration. Finally, Section 6 discusses adaptive leadership, followed by the conclusions. The paper addresses government responses to the COVID-19 shock and the implications for economic policy. Evidence from both developed and developing countries is reviewed, and the policy lessons for coping with an external shock of the magnitude of COVID-19 are assessed from the perspective of developing countries, but with a particular focus on Africa.

2. The Complexity and Critical Features of the COVID-19 Crisis

2.1 The Varying Gravity of the Pandemic

The influence of the COVID-19 pandemic has been uneven among regions and countries. For instance, Asia and Africa account for one-third of global cases, despite constituting 67 per cent of the world population, primarily dominated by developing countries. Europe and the Americas, consisting mainly of advanced economies, account for 68 per cent of all cases and over 72 per cent of deaths, while their population is 23 per cent of the world's total (see Tables 1 and 2). Moreover, with 60 million cases and 860 000 deaths, the three highest ranking countries – the USA followed by India and Brazil – accounted for about 40 per cent of COVID-19 cases and 35 per cent of deaths worldwide by early January 2022 (Johns Hopkins University [JHU] 2022; WHO 2022). Ten countries (USA, India, Brazil, UK, France, Russia, Turkey, Germany, Spain and Italy) account for 62 per cent of the world's cases and 54 per cent of deaths. The USA alone accounts for 20 and 15 per cent of the world's cases and deaths respectively, despite having only 4.2 per cent of the world's population. Testing is a function of infection cases in that developing countries have significantly lower testing, which may not show the actual reality, and for deaths there may be different criteria for labelling death as being from COVID-19 (Boyle 2021).

The health toll from COVID-19 on different countries has varied enormously. The intensity of the public health crisis – infections and excess mortality attributable directly or indirectly to the coronavirus – did not map neatly onto population shares or incomes per capita. By early January 2022, the hardest-hit countries were the USA and Brazil in the Americas, accounting for three-fourths of the region's cases. In Europe, Asia and Africa, the three most-hit countries accounted for over half of the region's total cases and deaths (see Table 1). These figures indicate the diversity and complexity of the situation. Factors such as the effectiveness of policies, demographics, spatial distribution, the health profile of the population, public health infrastructure, and communications all play a role and therefore need to be analysed to understand specific regional, sub-regional and country contexts.

Table 1. Top Three Countries in all Regions – Cases and Deaths

	Cases (in millions)	Region's share in cases (in %)	Deaths (in thousands)	Region's share in deaths (in %)	Population (in millions)	Region's share of population (in %)
Americas						
USA	60.5	54.5	860	35.1	331	32.5
Brazil	22.5	20.2	620	25.3	212	20.8
Argentina	6.0	5.4	117	4.8	45	4.4
Sub-total	89.0	80.1	1 597	65.2	588	57.6
Americas total	111	100%	2 450	100%	1 020	100%
Asia						
India	35.5	41.3	483	37.2	1 380	29.4
Turkey	10.0	11.6	83	4.9	84	1.8
Iran	6.2	7.2	131	10.1	84	1.8
Sub-total	51.7	60.1	697	52.2	1 548	32.9
Asia total	86	100%	1 300	100%	4 700	
Africa						
South Africa	3.5	35	92	40	59	4.4
Morocco	1.0	10	15	6	37	2.8
Tunisia	0.7	7	25	11	12	1
Sub-total	5.2	52	132	57	108	8.0
Africa total	10	100%	230	100%	1 340	100%
Europe						
UK	14.0	15	155	10	68	9.1
France	11.2	11.8	125	8	65	8.7
Russia	10.6	11.4	315	20.3	146	19.5
Sub-total	35.8	38.5	595	38.4	279	37.3
Europe total	93	100%	1550	100%	748	100%

Sources: Johns Hopkins (2022), WHO (2022), Worldometer (2022). Numbers rounded to the nearest digit.

An essential feature of the COVID-19 global pandemic is that it has not played out uniformly in regions or countries. Not surprisingly, the distribution of COVID-19 cases and deaths is uneven across regions and within each region, with a few countries accounting for the bulk. For instance, South Africa, Morocco and Tunisia account for over half of the cases and 57 per cent of deaths in the African region. USA, Brazil and Argentina account for 89 per cent of cases and 65 per cent of deaths in the Americas. The UK, France and Russia account for over 35 per cent of cases and deaths in the European region (see Tables 2 and 3). A striking fact is that the increased number does not show any relationship with vaccination coverage. The USA and the UK, for instance, have high coverage. Governments and the scientific community now understand the COVID-19 virus better than in early 2020. However, there are still many unknowns. Expert views highlight that the world will have to “adopt a ‘live-with-COVID’ strategy” and a COVID-19 transition from pandemic to endemic (Standage 2021).

While the accuracy of data and levels of COVID-19 diagnostic tests influence the figures, additional factors drive the variations. Vaccination rates remain a crucial driver; however, evidence suggests that the comprehensiveness of all responses and protection measures, demography, urbanisation and habitation patterns (whether living in crowded areas or

slums), level of mobility, the public health structure, the underlying health situation of the population, the depth of poverty and the social fabric do have a significant influence. Levels of trust in public officials (such as in the UK), vaccine scepticism in society (such as in France), and the effectiveness of communication strategies have significant implications.

Table 2: Regional Coverage (January 2020 to January 2022)

Region	Cases (in millions)	Share in world cases (in %)	Deaths (in millions)	Share in world cases (in %)	Population (in millions)	Share of the world population (in %)
Americas	111	37.0	2.45	44.5	748	13.1
Europe	93	31.0	1.55	28.2	1 020	9.6
Asia	86	28.7	1.30	23.6	4 700	60.1
Africa	10	3.3	0.23	4.2	1 340	17.2
Total	300	100	5.5	100	7 900	100

Sources: Johns Hopkins (2022), WHO (2022), Worldometer (2022). Numbers rounded to the nearest digit.

Table 3: Top Ten Countries Worldwide – Cases and Deaths

	Cases (in millions)	World share (in %)	Deaths (in thousands)	World share (in %)	Population (in millions)	World share (in %)
USA	60.5	20.2	860	15.6	331	4.2
India	35.5	11.8	483	8.8	1 380	17.5
Brazil	22.5	7.5	620	11.3	212	2.7
UK	14.0	4.7	155	2.8	68	0.9
France	11.5	3.8	125	2.3	65	0.8
Russia	11.0	3.7	315	5.7	146	1.8
Turkey	10.0	3.3	83	1.5	84	1.1
Germany	7.5	2.5	115	2.1	84	1.1
Spain	7.0	2.3	90	1.6	47	0.6
Italy	7.0	2.3	139	2.5	60	0.8
Total	186.5	62.2	2 985	54.3	2 477	31.4

Sources: Johns Hopkins (2022), WHO (2022), Worldometer (2022). Numbers rounded to the nearest digit.

2.2 The Depth of the Crisis and Diversity in Responses

By the end of 2021, more than US\$16 trillion in economic stimuli and recovery packages had been earmarked worldwide, predominantly by advanced economies (UNCTAD 2021a). The sheer scale of the recovery package is phenomenal, and nothing its size has been witnessed in history. Unsurprisingly, the lack of uniformity in government responses and policies in advanced and developing economies reflects the governments' strengths and political constraints. Emphasis is put on public awareness, testing and tracing, social distancing and national lockdown strategies, while economic rescue packages to support households, businesses and employment have varied.

2.2.1 COVID-19 and Inequalities

An essential feature of the COVID-19 crisis has been that it widened inequalities, both internationally and within national economies (IMF 2021; UNCTAD 2021a). According to the ILO (2021: 2), unemployment rose by 8.8 per cent worldwide and by 14.6 per cent in Europe in 2021 because of hours lost to unemployment, inactivity, and reduced hours. The Organization for Economic Cooperation and Development ([OECD] 2021: 4) highlights that, of the 114 million jobs lost globally compared to 2019, 22 million were lost in OECD countries due to the pandemic-related recession. The initial short-term supply crisis led to a more profound demand shock, which complicated the economic policy response in 2021. The global trade volume fell by 5.3 per cent in 2020 (WTO 2021). World investment inflows, which had been stagnating since the global financial crisis, shrank from a high of US\$2 trillion in 2007 to a record low of below US\$1 trillion in 2020 (UNCTAD 2021a). Similarly, after a rise in its share of global trade, from 37 to 50 per cent between 1970 and 2010, the global value chain (GVC) stagnated, demonstrating low resilience in the face of significant disruption (World Bank 2020). The pandemic, especially at the beginning, has also brought to the forefront the issue of diversified supply chains, reduced reliance on particular countries and on-shoring.

In developing countries, the number of people living below the poverty line rose sharply in 2020 and 2021, severely hitting the informal sector. The African Development Bank (2021: 7) states that

COVID-19 effects could reverse hard-won gains in poverty reduction over the past two decades. Revised estimates show that up to 38.7 million more Africans could slide into extreme poverty in 2020–21, pushing up the total to 465.3 million people, or 34.4 per cent of the African population, in 2021. The estimated cost of bringing their income up to at least the poverty line is about \$7.8 billion in 2020 and \$4.5 billion in 2021. Inequality is likely to increase, and school closures could have long-lasting consequences for human capital accumulation and productivity growth.

Many African governments initially introduced national lockdowns in response to the COVID-19 pandemic, which significantly undermined their economies in terms of growth and inequalities.

In South Africa, for instance, despite the government's timely public health emergency responses and recovery stimuli, leading South African economists have pointed to the worrying magnitude of inequality and policy concerns. Francis et al. (2020: 353) warn that

the COVID-19 pandemic has highlighted and exacerbated inequalities in South Africa. [...] South Africa is one of the most unequal countries in the world, and the COVID-19 pandemic is exacerbating these inequalities. By some estimates, unemployment in South Africa could reach 50 per cent in the next few months.

Inequalities are one of the most complex policy challenges that the COVID-19 crisis has further aggravated throughout developing countries, and the South African case is a glaring example of the depth of the challenge.

2.2.2 Different Governments' Policy Responses and Inadequate Global Collaboration

The COVID-19 crisis occurred at a time when the international governance structure was at its weakest point in decades, when the G7 and G20 economies were at an impasse, consumed by their internal challenges, and when the United Nations and international financial institutions (IFIs) such as the World Bank and the IMF were prominent frontrunners in the conversation on the global economy. International posturing, particularly among major economies, undermined the response to health emergencies and economic recession. Poor international collaboration stood in contrast to the international collaboration of the post-Second World War recovery period (which led to the Marshall Plan to rebuild Europe and the founding of the Bretton Woods institutions), the 1997 Asian crisis, and the post-2008 economic recovery, as well as the global response to the SARS, MERS and Ebola pandemics.

The nature and patterns of governments' policy responses and measures differ markedly from those in earlier crises, such as the 1997 Asian financial crisis and the 2008 global financial crisis. Governments' responses were characterised by their focus on economic liberalisation, structural reform prescription and austerity, rather than on economic stimulus, and this worsened the sluggish economic growth, thus contributing to the current economic recession. For many countries, this involved the imposition of conditionalities by the IMF and other IFIs. In the early 2020s, similar to in the depression of the 1930s and the post-Second World War recovery, the focus of most governments' strategic attributes illustrates their strong inclination to intervention, activism and developmentalism (Best and Bradley 2020).

Indeed, the COVID-19 pandemic has reawakened a widespread appreciation of what governments can do to protect peoples' welfare and to stimulate, or even simply sustain, economic activity (see Table 4). Governments and monetary authorities have adopted extraordinary measures, even in the most liberal economies such as those of the USA and UK. The Federal Reserve in the USA cut interest rates to almost zero and announced unlimited purchases of government-backed bonds and mortgage-backed debt, among other far-reaching measures, while the government introduced a US\$3 trillion fiscal package, the largest yet, to support firms, local governments and households.

Table 4: Diversity of Government Policy Responses

Country	Strategy	Observations and outcomes
USA	Lockdown and vaccination	Denial and highly controversial, inadequate government coordination
Brazil	Incoherent response	Highly political contention, denial, weak government coordination
UK	Lockdown and vaccination	Highly politicised, weak trust in government, populism

Germany	Strict lockdown, massive stimuli, vaccination	Fast recovery, good government coordination, good public communication
Spain	Lockdown and public health	Public health measures were effective because of Spain's health system and the public's awareness
Sweden	No lockdown and public health	Focusing on public awareness and building herd immunity
China	Zero-COVID strategy	Zero tolerance, targeted lockdowns, protective measures, high vaccination coverage, quick
India	Lockdown and vaccination	Inconsistency, partially politicised, heavy fatality and economic loss
Mauritius	Comprehensive approach	Lockdown imposition, closure of the border, public health measures, social protection, high vaccination, economic stimuli 28 per cent of 2020 GDP
South Africa	Lockdown, economic stimuli	Coordinated policies, social protection, adequate vaccine support, scientific advances in identifying new variants

Source: Author's compilation from various sources

In the UK, the response in some ways echoed that of World War II, when Churchill strongly opposed interventions in markets but came to realise the need for intervention (leading to the food rationing system, among other things). In 2020, the Conservative government, which generally was loath to introduce social controls, eventually imposed a lockdown and school closures. After years of austerity in the wake of the 2008 crisis, the government rolled out £16 billion of additional spending on health and related services, £29 billion of support for businesses, and £8 billion to strengthen the social safety net. Various new loan guarantee schemes for businesses were introduced, including trade credit insurance guarantees, support for furloughed employees, etc. Small middle-income economies like that of Georgia in the southern Caucasus, which have prided themselves in recent years on their commitment to small government, revealed their capacity for swift and sweeping government action to mitigate the health shock and prevent economic freefall as tourism receipts and foreign investment plummeted. The IMF's COVID-19 policy response tracker gives a complete overview of the extraordinary range and depth of government actions globally.

3. Economic Stimulus and Response to the Crisis

3.1 Government Responses and the Economic Recovery Stimulus

Governments worldwide – mainly those of industrialised economies – have earmarked a total of over US\$8 trillion in response to the crisis, although financed primarily by debt at low-lending interest rates enacted by reserve banks. However, with ineffectual worldwide coordination, diverging economic stimuli and rescue plans are expected to produce different effects on economic recovery. The most prominent economic stimuli (US\$ 6.5 trillion), accounting for two-thirds of the total package, have been allocated by the USA, Japan and Germany. The economic stimulus has consisted broadly of three components serving different aims: supporting households to survive the crisis, providing resources for businesses to support employment, and targeting investment to create a new economy with a particular

focus on innovation and technological capability, productive capacity, and high-quality infrastructure. In the long term, the investment in the new economy will determine the landscape of international competitiveness.

The effective response in other major global economies has been more varied, but it is clear that the pandemic has boosted those pushing for expansive economic policies and production transformation. Germany's economic stimulus package is Europe's largest, amounting to US\$1.5 trillion and including support for the digital economy, the expansion of the auto industry, a significant subsidy for electric cars, measures to combat climate change, along with family support for every child and a reduction in value-added tax. The German package benefits from negotiation and agreement between the major political parties, consultation and negotiation between the federal government and states, and dialogue with industry. Support is given to small and medium firms, while other, 'old' industries that will affect employment creation have also been targeted, such as Lufthansa (Deutsche Welle 2020a). Germany has drawn on a long tradition of long-run finance (e.g. through KfW) and close relationships between finance and business. Furthermore, it appears that the pandemic has accelerated a shift away from austere macroeconomic policy toward a more expansionary fiscal stance.

Chancellor Merkel's rationale and guiding principle is that "it's clear that all of this requires a bold response ... it's about securing jobs, and keeping the economy running, or getting it going again" (Deutsche Welle 2020c). In addition, Merkel focused on support for the new economy and global champions: "We have seen that others, whether the United States of America, South Korea, Japan, or China, have relied very heavily on global champions ... I believe that this approach is the necessary answer" (Jennen and Delfs 2020). These measures focus on strengthening Germany's innovation and the manufacture and export of industrial technology and equipment, among the leading contributors to the country's GDP and employment.

The US-China trade conflict became prominent after 2017 and was further intensified by the pandemic. The coronavirus has shifted the conversation and pushed for further domestic reliance, with the vision "Made in Germany: Industriestrategie 2030" championed by Merkel's activist strategy. The strategy includes a 100 billion euro fund to buy stakes in companies, to be increased if needed; German states being encouraged to set up similar funds to safeguard local champions; takeover controls being extended to give the government authority to block foreign purchases on the basis of 'potential interference'; the seeding of burgeoning industries like artificial intelligence, battery-cell production and clean energy; and promoting local suppliers to reduce reliance on companies outside the EU (Jennen and Delfs 2020).

COVID-19 economic measures have also included a restriction on takeovers by foreign firms, particularly with the aim of "protect[ing] critical European assets and technology in the current crisis" (European Commission 2020). The focus on the green economy, innovation and support for the auto industry has been followed by other European countries, such as France.

President Macron highlighted: “We need to not only save the industry but transform it” (Deutsche Welle 2020b).

Similar ideas have emerged in the USA, including the Biden Administration’s “Made in America” policy, but the actual policy response thus far has been less strategically coherent. The recovery package was “badly designed”, leading to delays during implementation and making it difficult to measure outcomes. The stimulus contains components of household support, support for firms to maintain employment levels, and support for creating a new economy. However, inadequate conditions are imposed on firms seeking to access support to preserve employment. Ailing big businesses in the air industry, including commercial aircraft manufacturers who have failed to compete, are beneficiaries. Some big businesses have shown reluctance to accept conditions and have ignored calls not to lay off their workers.

Second, the resources allocated for creating the new economy are too little and too late. The bipartisan Endless Frontier Act initiative promises to focus on driving innovation, science and technology in “strategic technologies central to the competition”, including artificial intelligence and machine learning, advanced and quantum computing, advanced manufacturing, disaster prevention, advanced communications technology, biotechnology, cybersecurity and advanced energy. The legislation proposes the re-establishment of the American Science and Technology Foundation. According to Senator Schumer (Young, 2020):

The coronavirus pandemic has shown the science and technology gap between the United States and the rest of the world is closing fast, and that threatens our long-term health, economic competitiveness, and national security. [...] To ensure our advantage, our bill treats scientific research as a national security priority and provides substantial new investments into funding critical research and development to build the industries of the future in regions across the country.

The bill’s outcome in building a new economy would depend on the scale of the resources and pace of implementation. Meanwhile, MIT president Rafael Reif (2020) has argued: “Unfortunately, much of the resulting policy debate has centred on ways to limit China’s capacities – when what we need most is a systematic approach to strengthening our own.”

Multiple factors would determine the outcome of the economic recovery, including the size and composition of each component and how well the stimulus package is designed to ensure speedy and effective implementation. Effective governments have proven to be essential in ensuring the success of economic recovery in the quickest possible time. Extraordinarily effective governments are the hallmark of those East Asian countries with a proven record of practical policy. Integrated and harmonised public health and economic measures have been critical to the outcome. However, preliminary signs are that countries with vital manufacturing sectors have done better in terms of public health mobilisation and speed of recovery from the economic effect of the pandemic, with Germany and China being typical examples.

3.2 Channelling Industrial Capacity to the Public Health Emergency

The fight against COVID-19 has become a battle of technological advances, innovations and organisational coherence. The earlier experience with SARS and MERS, and decades of close state–business relations geared to national development goals, lay behind the coherent public health, economic and productive response to COVID-19. As Kent Calder of the Centre for East Asian Studies at Johns Hopkins University argues, the East Asian cases show that “in emergencies, there is a key potential role for governments in jump-starting response, stimulating production, and facilitating supply. Moreover, there is also a role for governments in planning, while learning from the past, and respecting the dynamic creative potential that market forces ensure” (HUB 2020).

Taiwan’s coronavirus success was based on “efficient coordination across the public and private sectors coupled with the innovative deployment of advanced technology – the very same recipe that has delivered decades of economic growth” (Feigenbaum and Smith 2020). Taiwan, which had already started to focus on bio-medicine, artificial intelligence and digital health, used these technologies and big-data applications effectively, integrating its national databases, tracking incoming travellers, using cell phones to trace and organise quarantine, and applying digital technology to administer the demand and supply of face masks (Feigenbaum and Smith 2020; Tseng et al. 2020). However, the application of such trace-and-track methods may be contested in some contexts, as it may be unpopular in other countries because of values related to the protection of privacy and freedom rights.

Equally, the measures taken by South Korea were supported by advanced technologies (Campbell 2020). Diagnostic testing capacity was at the heart of the fight against COVID-19. Big-data approaches to contact tracing and digital technology were used effectively, if somewhat over-zealously, early on (Zastrow 2020). A few days after the first reported COVID-19 cases, the South Korean government fast-tracked and incentivised five domestic biotechnology firms to pursue the production of COVID-19 testing kits for both domestic use and export (Zastrow 2020).

Over the last ten years, Singapore has developed a diagnostic development hub and attracted biotech firms. This was complemented by free testing, with treatment costs covered by the government. Singapore used digital contact tracing with a unique Trace Together app to limit the spread effectively (Hsu and Tan 2020). In the USA, the government implemented ‘Operation Warp Speed’, which facilitated the fastest vaccine development ever seen, an example of the US channelling industrial capacity to the pharmaceutical industry (NIHB 2021).

China also used artificial intelligence and big data for tracing and coordination. China’s significant advantage was using its industrial capacity and scale to build new hospitals and manufacture medical equipment and pharmaceutical goods. China emerged as the most significant production hub for ventilators, PPE and testing kits, becoming the leading exporter and accounting for more than half of global production. Even before the pandemic, China

accounted for 45 to 50 per cent of the global output of PPE (EHS Today 2020), thanks to the depth and completeness of its supply chains, its highly productive industrial ecosystem, and its modern connectivity infrastructure.

According to Ken Caldor (HUB 2020), the East Asian cases show, as during the five decades of industrial transformation and technological catch-up, that “in emergencies, there is a key potential role for government in jump-starting response, stimulating production, and facilitating supply. Moreover, there is also a role for government in planning ahead while learning from the past, and respecting the dynamic creative potential that market forces ensure”.

The East Asian countries have learnt profound lessons from recent pandemics. China learned from SARS in 2003. Similarly, Taiwan and Singapore drew up public health emergency plans and established a command centre (Tay and Chen 2020). South Korea’s learning and comprehensive measures were based on MERS.

MERS, for instance, compelled South Korea to revise its infectious diseases laws in 2015, requiring greater disclosure of information to the public and harmonising important medical care and contingency-planning policies. As a result of these legal and institutional changes in response to the MERS pandemic, together with its longstanding tradition of government-business cooperation, South Korea was prepared to move quickly and decisively against COVID-19.

In summary, the East Asian cases show that advanced technologies have become essential instruments in the fight against the COVID-19 pandemic. They also show how the industrial policy approach and the industrial and technological transformation capacity translated into a practical and coherent government response to the public health emergency. Learning from past pandemics and experience invigorated the knowledge base and response to COVID-19.

4. Implications for Economic Policy in Developing Countries

In a recent publication, UN-DESA (2022) highlights three warning signs of the implications of COVID-19, being “the labour market recovery is lagging, and global poverty will remain high; a higher inequality – as the long-term scar of COVID-10; and a changing macroeconomic policy landscape”. The World Bank and the IMF have also revised their forecast for the economic recovery outlook for 2022 (IMF 2022). Managing vulnerabilities, boosting demand and macroeconomic policy measures, and consistently focusing on productive transformation within the changing landscape have become essential.

4.1 COVID-19 Crisis and Vulnerabilities

UN-DESA’s warnings and the World Bank’s gloomy downward forecast are justified, since the COVID-19 economic recession represents one of the most profound and most damaging economic crises of all time – a crisis like no other – when inequalities are growing within and

between countries. All economies are grappling with the challenge of recovery from a health and economic crisis unprecedented in living memory. The crucial lessons from this crisis must not be lost. The economic crisis has been accompanied by weak multilateralism, when global leadership is at its weakest – unlike, for example, the level of global commitment witnessed in the immediate aftermath of the 2008/2009 global financial crisis – and when the world needs, more than ever before and in the next nine years, international solidarity to achieve the 2030 Agenda for Sustainable Development and Sustainable Development Goals.

COVID-19 was not discriminatory in exposing the vulnerability of countries – as demonstrated by the limits reached even in the health sectors of some advanced economies. That said, however, the effect of the COVID-19 crisis in low- and middle-income economies with limited productive capacities has been to intensify their pre-existing economic, social and environmental vulnerabilities and expose their limited capacity to respond to external shocks effectively. Their vulnerabilities, lack of fiscal space and the unique structure of their economies have intensified the aggravating effect of the pandemic on people’s lives and livelihoods, especially in vulnerable groups. Indeed, since 2020, the COVID-19 pandemic and the resulting global recession have engulfed the most vulnerable economies, causing them to realise their worst performance in 30 years and undermining their prospects for a fast and inclusive economic and social recovery, and their ability to meet the SDG goals by 2030. A recent study by UNCTAD (2021c) has shown that least developed countries (LDCs) and other lower-middle-income developing countries will take several years to recover their 2019 GDP per capita levels.

Unlike most developed countries, which have raised nearly US\$16 trillion as stimulus and recovery packages following the COVID-19 crisis, the median LDC and lower-middle-income economies will take roughly three years to climb back to pre-COVID levels. There is consensus now that progress towards the SDGs has been affected profoundly by the pandemic, sometimes reversing years of development progress.

The pandemic has also deepened many pre-existing vulnerabilities plaguing middle-income countries. Poverty and hunger have worsened in these countries as income-earning opportunities were lost. Inequalities between advanced and middle-income countries have widened, as has the inequality within middle-income countries that face persistently high unemployment rates and regression in female participation in the labour market. The pandemic has also led to a worsening of their debt stress.

4.2 Productive Transformation at the Core of Economic Recovery

4.2.1 Targeted Economic Recovery Policies

Managing the COVID-19 economic crisis and post-COVID recovery is not only a matter of survival, but an essential step in the pursuit of broader economic transformation. It means reducing the damage to the most dynamic sectors as much and as early as possible, because

more productive activities have more significant spillover effects and are crucial for recovery and large-scale employment. In the presence of significant scarcity, the biggest mistake would be to spread resources thinly and uniformly across economic activities. Instead, policymakers should focus on productive capacity and export industries that are vital to ensuring foreign-exchange liquidity, easing balance-of-payments constraints, and generating employment.

The sources of vulnerabilities in most developing countries, particularly the least developed ones, are structural and built into what distinguishes them as low-income underdeveloped economies. Therefore, recovery from the current multidimensional crisis requires them to return to their pre-COVID growth and development path and prepare better for the next pandemic – or the next unforeseen external shock – by learning from the current crisis and building resilience.

Supporting productive transformation is timely and critical, since the root cause of developing countries' vulnerabilities is their limited capacity for the industrial production needed for transformative development. The lack of productive transformation capabilities restricts the ability of countries to diversify their economies; adds value and produces a diverse arrange of products; creates decent, well-paid jobs; reduces their dependence on commodities; promotes technological learning; improves labour productivity; tackles environment-related challenges; and kickstarts the process of structural transformation.

4.2.2 Debt Stress and Fiscal Space

Avoiding debt stress and expanding fiscal space are essential elements of the recovery effort and entail building productive capacities and coping with vulnerabilities. The external debt stocks of developing countries rose to a record level of US\$11.3 trillion in 2020, which is 2.5 times that of 2009 (US\$4.5 trillion). However, substantive debt relief has not materialised, unfortunately, and despite the worsening debt burden and the desperate need for additional finances to mitigate the negative influence of COVID-19. The measures taken have been helpful, but insufficient to accelerate recovery and provide fiscal space. A good example is the allocation of the new IMF SDR, a form of international reserve asset – 60 per cent for developed economies and only six per cent for low-income developing countries, where it is needed more.

Sadly, the Debt Service Suspension Initiative (DSSI) has not benefited many middle-income countries. Nevertheless, it has helped to forestall sovereign debt crises in many low-income economies, although merely postponing the crisis rather than solving it, for example through cancellation or adequate restructuring. It has resulted in the rapid rise in the ratio of total external debt stocks to exports, from 110 per cent in 2019 to 129 per cent in 2020 for all developing countries. There has been a corresponding rise in external debt service, with a significant rise in exports. Of particular concern are the many low-income countries in sub-Saharan Africa that are required to repay US\$13 billion in public debt from 2022 to 2024.

4.2.3 Environmental Sustainability and Green Transformation

Other essential elements for advancing productive transformation and building resilience include climate change and environmental sustainability. Apart from recovery from the COVID-19 shock, nothing highlights the importance of future development challenges more than the dangers posed by rising global temperatures. Keeping the rise in global temperatures below 1.5°C is, arguably, the predominant challenge facing the global policy community, even though this is inseparable from the redistribution of economic resources within and across countries.

Climate protection requires a massive wave of new investments to rewire energy systems and other carbon-emitting sectors, which will promote green industrialisation in latecomers. The green investment wave is a significant source of jobs and income in developed and developing countries. However, as highlighted by the Trade and Development Report 2021:

the existing constraints on developing countries would mean that innovative sources of finance are necessary, including a significant scaling up of support from the advanced economies and rich countries following their commitment to common but differentiated responsibilities, along with the policy space needed to tailor industrial policies to the local demands of a just transition (UNCTAD 2021a: 69).

Given the uneven global resource distribution, rapid progress in this direction will hinge on the immediate actions of the most prominent players, particularly China, the United States and the European Union. According to UNCTAD's estimates, "total clean energy investment spending in the range of 2–3 per cent of GDP per year" will be needed globally to meet the emissions-reduction target. Developing countries therefore need to pursue carbon-neutral green industrialisation paths, while the international community must join this partnership by accelerating technology transfer and providing financial resources (Mathews 2017; UNIDO 2022).

4.3 Resilience of Global Value Chains

In the last four decades, global value chains and global production networks have become all-pervasive, driven by the pursuit of ever lower production costs and global specialisation spearheaded by multinational corporations, and coupled with flexible just-in-time production systems (Gereffi 2018; UNCTAD 2013). Building resilience has become a key concern for advanced and emerging economies, including those national governments and firms that have questioned the unfettered global value chain system. This pattern has been entrenched by the rise of protectionism, populism, economic intervention and anti-globalisation sentiment.

Globalisation, featuring the mobility of capital, goods and information, has been the dominant economic force of the last four decades. A total of US\$2 trillion of FDI was recorded at its peak in 2007 (UNCTAD 2021b). This process has been facilitated by ICT and advances in

transportation, and spearheaded by transnational and multinational corporations with global production networks. Opportunities have opened up for developing countries to be inserted into global value chains, although few have upgraded their role. In what Peter Nolan terms the “global business revolution”, these global value chains exhibit different structures and global production systems. The pattern of global value chains across different industries is varied. While some are buyer-driven (such as the apparel sector), others (commercial aircraft manufacturers) are technology or producer-led.

However, global value chains, which have brought immense benefits for production efficiency and trade, have become vulnerable and are among the weakest links in the global economy. GVCs accounted for around 50 per cent of global trade by the 2008 financial crisis but, for several reasons – including rising protectionism and US-China trade tensions – their share of world trade has been declining ever since. COVID-19 has exposed the vulnerability of global value chains. Supply chains have been interrupted by health concerns and travel restrictions. Major transportation firms at the heart of GVC activities have suffered existential threats. Countries exporting commodities that feed into upstream GVC activities have suffered from falling demand. Supply has slowed down in countries dependent for their output on imported inputs. Dollar finance in emerging-market GVCs has become more costly as risk spreads have increased (World Bank 2020).

Among the significant implications for firms and governments is that regional economic integration and regional value chains will be reinforced. ASEAN has been a thriving regional value chain and will have more scope going forward. It has been the most robust regional value chain worldwide, and lessons may be learnt from its evolution. However, as lead firms diversify their risk, regional value chains on other continents and in other regions will have the opportunity to expand. Second, there will be a move towards a more straightforward, shorter value chain and robust vertical value chains in some industries, although this is not possible in all industries. Third, value chains will be redirected towards home markets, with production elements re-shored to be substituted by advanced industrial technologies such as automation, robotisation and digital technology. Such changes will have significant implications for developing countries competing on low labour costs.

The resilience of global value chains now is more vital than at any other time. We live in an increasingly interconnected world and, while the blind belief in unfettered globalisation may be contested, an interconnected global economy will continue. The global governance system and the structure of global production systems will evolve, improving resilience and reducing vulnerability. However, to hope for a fragmented economy driven by self-reliance would be unrealistic. According to economic historian Adam Tooze (2020):

Comparisons with the 1930s should not be taken too far. We do not live under the shadow of total war, and there are good reasons to welcome the end of 1990s-style hyper-globalisation. However, we should not underestimate the break with the recent past or kid ourselves that there is any obvious alternative on offer.

5. Africa's Policy Responses to COVID-19

5.1 COVID-19 and Implications for Africa's Health System

5.1.1 Primary Health Infrastructure and Communications

To comprehend the potential damage of the pandemic to Africa, one need only recall the West African Ebola epidemic from 2014 to 2016. Africa's response to the COVID-19 pandemic could be an opportunity to apply the lessons of recent Ebola outbreaks.

While direct investment in healthcare infrastructure and services is an essential step, public awareness is even more critical. The complexity of the fight against Ebola was often exacerbated by the peculiar social fabric, local community beliefs, political situation and economic 'faults', and the level of trust in government and political leaders. Hence, the public awareness campaign in response to COVID-19 must build public confidence and knowledge if fundamental behavioural changes are to be achieved in the form of permanent essential protection and hygiene measures in the workplace, schools, public spaces and home.

Furthermore, policymakers must understand that a universal and fully vetted vaccine effective against emerging variants, however critical, is still a long way off, and vaccination is only part of the comprehensive solution rather than an exclusive 'silver bullet' to defeat COVID-19. The most sustainable response is fundamental behavioural change. Reliable and consistent messaging by religious leaders, community elders, public figures and the media is essential, and health officials must promptly share up-to-date information about the pandemic's progress. High-level committees or task forces have been established to rationalise decisions, resource utilisation and coordination in many African governments, as seen in Ethiopia, Rwanda and South Africa.

The response to the COVID-19 pandemic could contribute to building a more robust healthcare system, better equipped to keep populations healthy in regular times and respond to inevitable future crises. Nevertheless, African governments will need outside support to be successful. In cooperation with communities and international actors, African governments can take steps now to restrict the damage and lay the foundations for a healthier, more resilient future.

5.1.2 Public Health Emergency Response

Many African governments have signalled a readiness to respond to the pandemic. However, designing measures that reflect the situation on the ground and ensuring that they are effective has proven to be a complex leadership challenge. The most vulnerable social groups have struggled to feed their families and cannot strictly follow preventive measures because they lack clean water and decent shelter in slums. Many African countries face even more significant social welfare challenges. The continent's grave situation in healthcare service saw

primary care staff providing only 1.06 nurses and midwives for every 1 000 inhabitants in 2018 (WHO 2020; Broom 2020).

The responses are as diverse as the continent itself, revealing local conditions, the evolution of the pandemic, resource constraints, and broader socio-economic issues. The number of 10 million reported cases and 230 000 fatalities in Africa in early January 2022 was considered very low in contrast to worldwide trends.

5.2 Diversity and Resilience During the COVID-19 Crisis

African governments have taken swift and bold measures to curb the pandemic, and economic measures to reduce its economic influence and cost. The effect of COVID-19 across African countries has differed, depending on the economic structure of specific countries. The African Development Bank (2021: 7) highlights:

The pandemic's economic impact varies across countries. The tourism-dependent economies are projected to recover from an 11.5 per cent decline in 2020 to grow 6.2 per cent in 2021; oil-exporting countries, from a 1.5 per cent decline to grow 3.1 per cent; other resource-intensive economies, from a 4.7 per cent decline to grow 3.1 per cent; and non-resource-intensive countries, from a 0.9 per cent decline to grow 4.1 per cent.

The response to the COVID-19 pandemic as far as public health emergency and economic rescue are concerned varies to reflect each country's particular situation. The African Development Bank (2021: 17) highlights that "[t]he average size of the fiscal stimulus packages deployed by countries is about 3 per cent of GDP, but it varies significantly from about 32 per cent in Mauritius to 10 per cent in South Africa to less than 1 per cent in Tanzania".

African governments face primary resource and fiscal constraints when providing effective economic responses, prioritising a highly political issue. South Africa and Egypt announced the most significant stimulus packages, at about US\$26 billion and US\$6.2 billion respectively. Mauritius and South Africa are among the countries that allocated significant recovery packages and social protection schemes. South Africa, for instance, has provided monthly support of R350 to vulnerable households, which played an important role. However, it is too early to review how effectively these households are targeted in terms of protection schemes for social groups and high-value economic activities. Effective lockdowns are constrained by low economic levels, living conditions, and community trust in national institutions.

The COVID-19 crisis has hit all African firms hard and, in the absence of any rescue package or recovery stimulus, most have struggled to survive. The aviation industry was one of the sectors affected the most because of travel bans and the decline in tourism. Unlike some bankrupt airlines or those rescued by their respective governments' rescue packages, Ethiopian Airlines (EAL) took swift measures to adapt to the new environment and build

resilience. For a landlocked country like Ethiopia, Ethiopian Airlines (EAL) is a strategic asset that generates significant foreign exchange earnings, supports the export sector, and contributes significantly to the GDP. It is the country's largest services-exporting company and one of the largest direct and indirect employers, with significant technological capabilities. However, when COVID hit, the government's scarce resources did not permit a rescue package for its flagship carrier, despite the latter's vital strategic contribution. Ethiopian Airlines had to park its growth strategy and focus on a survival strategy to adapt and build resilience by ensuring cash flow, reducing losses, and maintaining a healthy balance sheet.

Ethiopian Airlines diversified its passenger capacity by rapidly shifting to the cargo business, in line with market demand. It doubled its productivity and earnings by converting passenger aircraft to cargo. It also pursued a diversification strategy focused on technical services and a hotel subsidiary. It maintained its workforce and avoided lay-offs, as skill-building would be a critical driver of future expansion. In pursuit of its commitment to serve and connect Africa with the world, it has been a significant transporter of pharmaceutical goods to fight COVID-19 (Schipani and Pilling 2020). It has also sustained its commitment to the export sector, supporting exports of meat and horticultural and other goods (Floral Daily 2020). It is difficult to imagine the Ethiopian government's response to COVID-19 without the capability of Ethiopian Airlines, a critical policy instrument and strategic asset that has been central to Ethiopia's industrial policy. The case of Ethiopian Airlines – particularly how the company rapidly re-strategised to find an alternative way to cope with the unexpected shocks, including by repurposing and taking advantage of its competitive advantage, presents an essential lesson for policymaking at the national level. Regional integration is part of EAL's success, but only because its global freight network connects to the rest of the world, including Latin American countries, strengthening the airline's role in global supply chains, such as high-value agriculture (Schipani and Pilling 2020, Oqubay and Tesfachew 2019).

5.3 Vulnerabilities of the African Economy

The COVID-19 crisis was also a wake-up call for African governments. The first aspect entailed the urgent need to build a resilient prevention-oriented public health system with emergency capability. Failure to do so would lead to a continuing erosion of human capital and economic gains that would be wiped out during times of public health emergency. Member countries need to strengthen the Africa Centre for Disease Control under the African Union Commission to coordinate prevention and response capabilities.

Second, with the worst-hit economies seen to include oil-rich countries and commodity exporters, the economic crisis starkly illuminated the vulnerability of African economies. Economic diversification is at the heart of Africa's structural transformation, and the increasing focus on building productive capacity and upgrading requires an active industrial policy and development path and effective government (Wade 2004; Ocampo, Rada, Taylor 2009; Mazzucato 2011; Cramer et al. 2020). However, in economic structures dominated by the informal sector, and with Africa's youth requiring 20 million jobs annually, African

countries cannot ignore manufacturing and other, similarly 'industrial', higher productivity activities, including high-value agriculture. Industrial activities not only create jobs directly, but have substantial indirect employment effects (Kaldor 1967). Countries will experience improvement when moving from exporting commodities and raw materials to a focus on value addition.

Long-term investment in education, the development of human capital, green infrastructure that energises industrialisation, and economic diversification are essential (Mathews 2017). While macroeconomic stability is necessary, the ultimate aim must be to develop productive capacity and transform production. African countries will also benefit from mutual policy learning.

Third, the disruption in global value chains during the COVID-19 pandemic is an important alert for African countries to rely increasingly on building regional value chains through initiatives of the African Continental Free Trade Area (AfCFTA) and sub-regional economic integration. It also has implications for building verticality and the essential domestic linkages that global buyers increasingly promote. Leading brands and buyers have shown interest in diversifying the supplier chains from Asia-Pacific to other regions, including Africa. However, it should be noted that economic integration and building regional value chains require investment in infrastructure to improve connectivity and intra-Africa trade. The building of regional value chains implies vital and sustained investment in skills and manufacturing capabilities by African governments, along with improved investment conditions. At present, intra-Africa trade constitutes 16 per cent of total African trade – the lowest of any region. If African countries do not expand their productive capacity and diversify their economies, the prospect of increasing intra-Africa trade will remain a dream.

Interestingly, nearly half of Africa's intra-Africa trade is in manufacturing. Moreover, informal cross-border trade in Africa accounts for more than formal intra-Africa trade, and some of the goods traded informally are also manufactured in Africa. Thus, pushing diversification into the manufacturing agenda and pursuing exports in Africa is critical for future growth and AfCFTA's success.

Fourth, the broader use of industrial policy in advanced economies will be conducive for African governments to exploit the policy space to pursue an active industrial policy. In terms of industrial policy design, the disruption of global value chains also heralds limitations on the scope for insertion into them. The focus on domestic capabilities and domestic linkages is becoming ever more urgent and vital for building competitiveness in a world of increasingly stiff competition.

6. Implications for Economic Policies

6.1 The Adaptability of Industrial Policy

Interest in industrial policy has increased recently, emerging from a 'district' of heterodox economics into the mainstream (Cherif and Hasanov 2018; Oqubay et al. 2020). The COVID-19 story arguably suggests the growing importance of industrial policy and the government's developmental role. Governments with rich experience in industrial policymaking have shown a remarkable ability to translate industrial capacity in the economy into public health capacity in their response to the pandemic. Some governments have proactively repurposed their industrial capacity; some have been less affected by the disruption of global value chains.

Industrial policies continue to be vital and must adapt to new situations (List 1956, Amsden 1989, Chang and Andreoni 2020). The complex crisis triggered by the pandemic has exposed the vulnerability of the economic system and the vast differences in government measures and industrial policies. The new landscape appears conducive to state activism and industrial policy. However, an industrial policy must be based on a pragmatic approach, adapting to the evolving situation and, in the new decade, will need to focus on structural transformation and economic catch-up. Diversifying production and trade in developing countries can be challenging but vital for structural transformation.

It will be essential to invest in innovation and technological capability in frontier technologies, and in the industrial base of advanced economies (Lee 2019; Schumpeter 1934). The middle-income trap that can plague emerging economies will necessitate focusing on innovation and technology. China poses both threats and opportunities for advanced, emerging and developing economies (Paus 2019).

COVID-19 has affected and may transform how we live, work and learn. The advances in the digital economy will transform education, work and e-commerce. Health is an increasingly crucial driver of scientific breakthroughs, and COVID-19 will further invigorate this trend. If there is one lesson that has been learnt from the COVID-19 shock it is that digital transformation is vital for any economy to move forward in the twenty-first century. COVID-19 has put the spotlight on digitalisation. At least in developed economies, working from home, educating children from home, e-shopping from home, participating in meetings and seminars from home, and searching for a vaccine using rapid information flow through AI would have been impossible without advances in digital technologies.

Safety and health care will be more central in the design of production systems and the development of the industrial workforce. During the COVID-19 pandemic, a plummeting oil price and reduced electricity consumption due to the economic slowdown made coal less viable and accelerated the transition to clean energy. Support for climate change action and electric cars will further accelerate this momentum. Traction is being created to make carbon-neutral industrialisation and green industrial policy necessary.

6.2 Global Collaboration and Reforming the International Governance System

Those most vulnerable to the COVID-19 pandemic are developing countries because of their low economic resilience, weak innovation and technological capability, underdeveloped healthcare systems, minimal resource bases, and social fabric. However, a global threat like COVID-19 leaves no population or geographical area untouched. This necessitates dual policy responses: the need for international collaboration, and support for developing economies as part of international cooperation. The big powers, including the G7 and the G20, and the emerging economies must strengthen their collaboration with developing countries to overcome this global threat. Exceptional leadership is essential for an effective response to an unprecedented global threat.

The collective and coordinated global response to the COVID-19 crisis must focus on installing diversified strategies, scientific collaboration and effective international governance systems.

First, each government's response to COVID-19 needs to reflect its specific conditions, such as demography, settlement patterns, healthcare systems, economic conditions, and political/governance systems, as these differ among countries and regions.

Second, the COVID-19 pandemic is primarily a health issue in which scientific advances and research breakthroughs are central. Developing new, affordable and effective vaccines and treatments is vital and a priority. Leading technological breakthroughs in tracking and tracing systems are critical, as are technologies that improve analytical and decision-making processes. Research and development to underpin scientific advancement require international collaboration between governments, the private sector, the scientific community and universities. Scientific breakthroughs should focus on identifying, protecting from and curing infectious diseases, which continue to be a significant constraint for developing countries. These endeavours should also tackle climate change, a significant contributor to health risks.

Third, it has to be noted that the international governance system and the essential roles of the Bretton Woods institutions, which served the realities of the post-Second World War era, have now fundamentally changed. The nature of global capitalism and global power dynamics have also shifted significantly. Hence, the inability of institutions to respond effectively to global threats, including pandemics, the climate change crisis and cyberwar, suggests the failure of international governance systems. The developing world is underrepresented in international governance systems and international agreements that serve the great core powers' interest, while failing to protect those of developing countries. The UN, WTO and other multilateral institutions struggle to fulfil their mandates (Gallagher and Kozul-Wright 2021).

6.3 Adaptive Leadership and the COVID-19 Response

In the complex and multidimensional COVID-19 crisis, with the socio-economic foundations of a society fractured, what is needed is not only exceptional leadership, but also transformative and adaptive leadership. Policymakers and leaders must take swift and bold decisions in the face of inadequate evidence, incomplete scientific advice, and evolving uncertainty.

Governments need to understand their unique circumstances and take unconventional approaches. Leaders must make swift decisions based on the best available scientific evidence, despite the uncertainties. Standard prescriptions will not work in this multidimensional crisis, which will have long-term implications. It requires local and national responses that take the unique context of each country into account, along with united international responses and unified regional actions. The diverse and particular approaches taken by the governments of Sweden and Spain are examples.

Many governments of developing countries have relied on community mobilisation and public awareness campaigns – including regular public announcements by prime ministers/presidents and health ministers – which have proven effective and cost-efficient. South Africa has effectively utilised the research capability of its institutions to play a leading role in scientific breakthroughs – typically seen in the discovery of Omicron – enabling the world to reduce significant economic and public health emergency damage (see Catterill 2022; Henley 2020; Pilling 2021; Schraer and Mwai 2021). During the initial phase of COVID-19 in 2020, many African countries relied on the diagnostic capacity of South Africa, whose leading scientists have played a prominent role in presenting their scientific perspective and coping with the uncertainty of lesser-known infectious diseases.

Leadership, after all, is about building on strengths. COVID-19 has presented an opportunity to strengthen resilience and thrive on new opportunities. As already noted above, Ethiopian Airlines' response is a classic example. Another example is Ethiopia's response to COVID-19. Ethiopia, a low-income developing country, has pursued a cost-effective prevention strategy for over two decades and relied on its existing primary public healthcare infrastructure and health extension system, with more than 75 per cent of healthcare professionals working in 21 000 health posts and health centres. In addition, the government has utilised its public infrastructure and publicly owned enterprises (such as railways and air transport) as vehicles for positive intervention to support manufacturers and exporters.

6.4 Conclusion

The COVID-19 crisis is unprecedented and multifaced, and has overwhelmed all regions, countries and industries, with significant implications for economic policies in developing countries. This paper highlights observations and insights with immense relevance to policymaking.

First, the effects of COVID-19 on countries have been diverse and, not surprisingly, the responses by governments have been uneven. This suggests that a 'one-size-fits-all' approach to policy response is unlikely to work. Economic policies need to reflect the specificities and capacities of countries and the context in which they are implemented. Unfortunately, developing countries had to cope with the crisis in the face of resource constraints and other developmental challenges. The Ethiopian Airlines example discussed in this paper provides a valuable lesson – that when faced with unforeseen external shocks, firms and governments should build on their competitive advantage and use the crisis as an opportunity to build resilience.

Second, the COVID-19 pandemic showed the vitality of building health infrastructure and organising early-warning systems in preparation for future pandemics. Developing countries that fail to learn from this important lesson will live to regret the outbreak of another pandemic, which cannot be ruled out. For African countries, the COVID-19 crisis is a wake-up call on two levels – first, the urgent need to build a resilient and prevention-oriented public health system with emergency capability, and second, the need to develop their productive capacities, which are vital for producing some of the basic medical supplies and necessities that are needed during a global pandemic and economic crisis.

Third, the review indicates that economic policies targeting economic recovery could synergise with productive transformation goals to ensure sustained growth and competitiveness. The evidence suggests that macroeconomic policies should synergise with industrial policies to support production transformation and reflect recent changes. The policy response to public debt stress and inflation deserves focus to maintain and accelerate the recovery and momentum of production transformation.

Finally, and arguably, the COVID-19 story highlights the growing importance of industrial policy and the government's developmental role – the implications of COVID-19 for policy. Although industrial policy has been revived in recent years, the COVID-19 crisis has placed it at the centre of policymaking, dashing any doubts about its importance. Many governments have responded swiftly, and the evidence shows the essential role of the state.

References

- African Development Bank. (2021). *Economic outlook 2021. From debt resolution to growth: The road ahead for Africa*. Available from: <https://www.afdb.org/en/documents/african-economic-outlook-2021>
- Amsden, A. (1989). *The rise of Asian Giant: South Korea and late industrialisation*. Oxford: Oxford University Press.
- Best, M. & Bradley, J. (2020, 27 March). World War II to Covid-19: Been here before and done better. Institute for New Economic Thinking. Available from: <https://www.ineteconomics.org/perspectives/blog/world-war-ii-to-covid-19>
- Boyle, P. (2021, February 18). How are COVID-19 deaths counted? It's complicated. *Association of American Medical Colleges*. Available from: <https://www.aamc.org/news-insights/how-are-covid-19-deaths-counted-it-s-complicated>
- Broom, F. (2020). Rich countries 'raiding' developing world's nurses. SciDevNet. Available from: <https://www.scidev.net/global/news/rich-countries-raiding-developing-world-s-nurses/>
- Campbell, C. (2020, April 30). South Korea's health minister on how his country is beating coronavirus without a lockdown. *Time*. Available from: <https://time.com/5830594/south-korea-covid19-coronavirus/>
- Catterill, J. (2022, January 7). South Africa offers clues to life after Omicron. *The Financial Times*. Available from: <https://www.ft.com/content/b0cd9239-f2df-4afc-912f-b3f87fc676ff>
- Chang, H.-J. & Andreoni, A. (2020). Industrial policy in the twenty-first century. *Development and Change*, 51(2): 324–351. <https://doi.org/10.1111/dech.12570>
- Cherif, R. & Hasanov, F. (2018). *The return of the policy that shall not be named: Principles of industrial policy*. IMF Working Paper WP/19/74. Washington, DC: International Monetary Fund.
- Cramer, C., Sender, J. & Oqubay, A. (2020). *African economic development: Evidence, theory, policy*. Oxford: Oxford University Press.
- Deutsche Welle. (2020a, March 25). Coronavirus: German parliament passes historic aid package. Available from: <https://www.dw.com/en/coronavirus-german-parliament-passes-historic-aid-package/a-52908339>
- Deutsche Welle. (2020b, May 27). France unveils stimulus plan worth €8 billion for car industry. Available from: <https://www.dw.com/en/france-unveils-stimulus-plan-worth-8-billion-for-car-industry/a-53578294>
- Deutsche Welle. (2020c, June 6). Germany's Angela Merkel unveils stimulus package to kickstart economy. Available from: <https://www.dw.com/en/germanys-angela-merkel-unveils-stimulus-package-to-kickstart-economy/a-53677420>

- EHS Today. (2020, April 8). 3M will import 166 million respirators from China. Available from: <https://www.ehstoday.com/ppe/article/21128174/3m-will-import-166-million-respirators-from-china>
- European Commission. (2020). 'Coronavirus: Commission issues guidelines to protect critical European assets and technology in current crisis', Press Release, Brussels, 25 March. Available from: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_20_528/IP_20_528_EN.pdf
- Feigenbaum, E. & Smith, J. (2020, June 1). How Taiwan can turn coronavirus victory into economic success. *Foreign Policy*. Available from: <https://foreignpolicy.com/2020/06/01/taiwan-coronavirus-pandemic-china-economy-technology/>
- Floral Daily. (2020, May 20). Ethiopia secures \$400 million from horticulture export. Available from: <https://www.floraldaily.com/article/9218599/ethiopia-secures-400-million-from-horticulture-export/>
- Foulkes, I. (2021, November 28). Covid: Swiss back government on Covid pass as cases surge. *BBC News*. Available from: <https://www.bbc.com/news/world-europe-59380745>
- Francis, D., Valodia, I. & Webster, E. (2020). Politics, policy, and inequality in South Africa under COVID-19. *Agrarian South: Journal of Political Economy*, 9(3): 342-355.
- Gallagher, K. P. & Kozul-Wright, R. (2021). The case for a new Bretton Woods. London: Polity.
- Gereffi, G. (2018). *Global value chains and development*. Cambridge: Cambridge University Press.
- Henley, J. (2020, September 25). What lessons can Europe learn from Sweden's Covid-19 experience? *The Guardian*. Available from: <https://www.theguardian.com/world/2020/sep/25/what-lessons-can-europe-learn-from-sweden-covid-19-experience>
- Hsu, L. Y. & Tan, M.-H. (2020, March 23). What Singapore can teach the US about responding to Covid-19. *STAT*. Available from: <https://www.statnews.com/2020/03/23/singapore-teach-united-states-about-covid-19-response/>
- HUB. (2020, May 13). East Asia offers mixed lessons in Covid-19 response. Available from: <https://hub.jhu.edu/2020/05/13/east-asian-response-to-coronavirus/>
- ILO. (2021, January 25). *ILO Monitor: COVID-19 and the world of work*. Seventh edition. Available from: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_767028.pdf
- IMF. (2021). *World economic outlook October 2021: Recovery during a pandemic*. Available from: <https://www.imf.org/en/Publications/WEO/Issues/2021/10/12/world-economic-outlook-october-2021>
- IMF. (2022). *Rising caseloads, a disrupted recovery, and higher inflation*. Available from: <https://www.imf.org/en/Publications/WEO/Issues/2022/01/25/world-economic-outlook-update-january-2022>

- Jennen, B. & Delfs, A. (2020, May 29). Germany's bold new economic plan for a post-coronavirus world. *Al Jazeera*. Available from: <https://www.aljazeera.com/economy/2020/5/29/germanys-bold-new-economic-plan-for-a-post-coronavirus-world>
- Johns Hopkins University (JHU). (2022). *Coronavirus Resource Centre: COVID-19 dashboard*. Available from: <https://coronavirus.jhu.edu/map.html>
- Kaldor, N. (1967). *Strategic factors in economic development*. Ithaca: New York State School of Industrial and Labour Relations, Cornell University.
- Lee, K. (2019). *The art of economic catch-up: Barriers, detours and leapfrogging in innovation systems*. Cambridge: Cambridge University Press.
- List, F. (1856). *National system of political economy*, Volume I–IV. Memphis, TN: Lippincott.
- Mathews, J. (2017). *Global green shift: When CERES meets GAIA*. London: Anthem Press.
- Mazzucato, M. (2011). *The entrepreneurial state: Debunking public vs private sector myths*. London: Anthem Press.
- NIHB (2021). *Explaining Operation Warp Speed*. US Department of Health and Human Services. Available from: <https://www.nihb.org/covid-19/wp-content/uploads/2020/08/Fact-sheet-operation-warp-speed.pdf>
- Ocampo, J. A., Rada, C. & Taylor, L. (2009). *Growth and policy in developing countries: A structuralist approach*. New York: Columbia University Press.
- Oqubay, A., Cramer, C., Chang, H.-J. & Kozul-Wright, R. (eds). (2020). *The Oxford handbook of industrial policy*. Oxford: Oxford University Press.
- Oqubay, A., and Tesfachew, T. (2019). 'The Journey of Ethiopian Airlines: Technological Learning and Catch-up in Aviation', in Arkebe Oqubay and Kenichi Ohno (eds) *How Nations Learn: Technological Learning, Industrial Policy, and Catch-up*. Oxford: University Press, pp. 285-309.
- Organisation for Economic Cooperation and Development (OECD). (2021). *OECD employment outlook 2021: Navigating the COVID-19 crisis and recovery*. Paris: OECD Publishing.
- Paus, E. (2019). Innovation strategies matter: Latin America's middle-income trap meets China and globalisation. *The Journal of Development Studies*, 56(4): 657-679 <https://doi.org/10.1080/00220388.2019.1595600>
- Pilling, D. (2021, November 30). What South Africa and Omicron tell us about inequality. *The Financial Times*. Available from: <https://www.ft.com/content/9e7bf28a-c4c4-4d02-9268-dbb07e30a37a>
- Reif, R. (2020, June 1). Is the 'endless frontier' at an end? *The Hill*. Available from: <https://thehill.com/opinion/technology/500417-is-the-endless-frontier-at-an-end>
- Schraer, R. & Mwai, P. (2021, December 16). Omicron: What can we learn from South Africa's experience so far? *BBC News*. Available from: <https://www.bbc.com/news/59667268>
- Schumpeter, J. ([1934] 2017). *The theory of economic development*. New York: Routledge.
- Schipani, A. & Pilling, D. (2020, 22 May). Ethiopia steps in to deliver respirators to Latin Americans. *The Financial Times*. Available from: <https://www.ft.com/content/c17614d0-cd94-4160-af0b-32dae6940253>

- Standage, T. (2021, November 8). The world ahead: Ten trends to watch in the coming year. A letter from Tom Standage, editor of "The World Ahead 2022". *The Economist*. Available from: <https://www.economist.com/the-world-ahead/2021/11/08/ten-trends-to-watch-in-the-coming-year>
- Tay, S. & Chen, K. (2020, April 21). Singapore: The limits of a national response. *Council on Foreign Relations*. Available from: <https://www.cfr.org/blog/singapore-limits-national-response>
- The Economist. (2021, December 11). The Dutch style of government: Good for dykes, bad for covid. The Netherlands' consensual "polder model" moves too slowly in a crisis. Available from: <https://www.economist.com/europe/2021/12/11/the-dutch-style-of-government-good-for->
- Tooze, A. (2021). *Shutdown: How COVID shook the world's economy*. New York: Penguin Random House.
- Tregenna, F., Ewinyu, A. K., Oqubay, A. & Valodia, I. (2021). Challenges and complexities of the South African economy. In Oqubay, A., Tregenna, F. & Valodia, I. (eds), *The Oxford handbook of the South African economy* (pp. 3-25). Oxford: Oxford University Press.
- Tseng, Y.-C., Cheng, Y. T. & Jun, C.-H. (2020, May 7). Taiwan's experience with COVID-19, and aid to the Pacific. *Devpolicy Blog*. Available from: <https://devpolicy.org/taiwans-experience-with-covid-19-and-aid-to-the-pacific-20200507-1/>
- UNCTAD. (2013). *Global value chains. World Investment Report 2013*. Geneva: UNCTAD.
- UNCTAD. (2021a). *From recovery to resilience: The development dimension. Trade and development report 2021*. Geneva: United Nations Conference on Trade and Development.
- UNCTAD. (2021b). *Investing in sustainable recovery. World Investment Report 2021*. Geneva: United Nations Conference on Trade and Development.
- UNCTAD. (2021c). *The Least Developed Countries Report 2021. The least developed countries in the post-COVID world: Learning from 50 years of experience*. Available from: <https://unctad.org/webflyer/least-developed-countries-report-2021>
- UN-DESA. (2022). *World economic situation and prospects (WESP) 2022*. New York: United Nations, Department of Economic and Social Affairs.
- UNIDO. (2022). *Industrial Development Report 2022: The future of industrialisation in a post-pandemic world*. Vienna: UNIDO.
- Wade, R. (2004). *Governing the market: Economic theory and the role of the government in East Asian industrialisation*. Princeton, NJ: Princeton University Press.
- WHO. (2020, April 7). *World Health Day, 7 April 2020: Message of WHO Regional Director for Africa, Dr Matshidiso Moeti*. Available from: <https://www.afro.who.int/regional-director/speeches-messages/world-health-day-7-april-2020>
- WHO. (2022). *WHO coronavirus (COVID-19) dashboard*. Available from: <https://covid19.who.int/>
- Woolhouse, M. (2022). *The year the world went mad: A scientific memoir*. Dingwall, Scotland: Sandstone Press.

- World Bank. (2020). *Trading for development in the age of global value chains. World Development Report 2020*. Washington, DC: The World Bank Group.
- Worldometer. (2022). *COVID-19 coronavirus pandemic*. Available from: <https://www.worldometers.info/coronavirus/>
- World Trade Organisation (WTO). (2021). *World trade primed for strong but uneven recovery after COVID-19 pandemic shock*, 1 March. Available from https://www.wto.org/english/news_e/pres21_e/pr876_e.htm#:~:text=According%20to%20new%20estimates%20from,second%20quarter%20of%20last%20year.
- Young, T. (2020, May 27). Young, Schumer unveil Endless Frontier Act to bolster US tech leadership and combat China. Todd Young: US senator for Indiana. Available from: <https://www.young.senate.gov/newsroom/press-releases/young-schumer-unveil-endless-frontier-act-to-bolster-us-tech-leadership-and-combat-china>
- Zastrow, M. (2020, May 12). How South Korea prevented a coronavirus disaster – and why the battle isn't over. *National Geographic*. Available from: <https://www.nationalgeographic.com/science/2020/05/how-south-korea-prevented-coronavirus-disaster-why-battle-is-not-over/>

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