GENN:
Global Economic Neural Networks

Economic Resilience in the Face of the Coronavirus Challenge

GENN Research Paper I
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Table Of Contents

Abbreviations

ASEZs	Advanced Special Economic Zones
CHS	Johns Hopkins University Center for Health Security
EAC	East African Community
ECB	European Central Bank
GENN	Global Economic Neural Networks
GHSI	Global Health Security Index
IMF	International Monetary Fund
NTI	Nuclear Threat Initiative
OECD	Organisation for Economic Co-operation and Development
PZs	Prosperity Zones
SMEs	Small and Medium Sized Enterprises
TFA	Trade Facilitation Agreement
WHO	World Health Organization
WTO	World Trade Organization

About
GENN

Globalisation is more than an abstract concept. It is in reality a system of living, developing and extending networks, connecting global hubs across continents.

We live and work in a global economy. Whatever the challenges it faces, the growth of globalisation benefits everyone.

Global Economic Neural Networks – GENN – is an initiative to examine ways to expand and improve the links between global hubs – places like Singapore, the United Arab Emirates and Hong Kong, as well as the old guard of London and New York – to create prosperity for all. GENN recognises and builds on new GENNeration diverse and robust supply chains, new GENNeration trade superhighways and new GENNeration economies connecting the world's

global nodes and critical hubs in living ecosystems that accelerate global growth.

GENN analyses and evaluates the common features that define those places, the model that they offer for others, and how they can become even more innovative and dynamic – while also helping the world to recover from the impact of coronavirus.

Introduction

In our first research paper, Global Economic Neural Networks (GENN) aims to address the subject of economic resilience in the wake of the coronavirus pandemic.

As attention progressively switches away from the immediate question of how effective public health measures, policy makers, global institutions and businesses are confronted with a question on how a likely initial recovery can be sustained to promote future growth; and how this growth can be sustained into the future.

This paper looks at how the pressing questions of global economic outlook have moved from the stagnating nature of global trade to the resilience and recovery of economies in the face of the pandemic. This enquiry is more applicable to high-income, leading economies that are forecast to see a return to pre-crisis levels of output much later than their developing and lower income counterparts.

We have identified four particular pillars of economic resilience and explained how the leading high-income economies of the United Kingdom, United States, United Arab Emirates, South Korea, and Singapore have best exemplified the principles of competitiveness, entrepreneurship, connectivity, openness and effective governance.

In providing a comparative analysis, this paper reminds us of the essential groundwork these nations have done to become a premier league of nodes within the global neural network that GENN studies.

Those foundations make them best placed to incubate future economic growth, whether via excellent health-care systems, strong governance standards, a commitment to open borders, and special economic zones that can provide a stimulus to trading relationships.

Executive Summary

The global trading system can be conceived of as a neural network, where sensory type economies must be protected from 'economic Parkinson's'

It is possible to conceive of the global trading system as a neural network where highly-integrated, knowledge-based, high-income economies reflect the role of sensory neurons. Economies such as the United States, United Kingdom, the United Arab Emirates, South Korea, and Singapore are at the forefront of technological and knowledge-based development. It is vital that their function as sensory neurons in the global economy continues to respond to shifting trends and patterns in order to develop technological, regulatory and systemic solutions to global challenges.

Economies resilient in the face of the pandemic share certain characteristics

Pandemic preparedness, the stringency of lockdown and containment measures, and the capacity to withstand a second wave. They typically have strong governance, have invested in healthcare, and are technologically adept. But not all nodes studied here are equal. Those that accelerated the stringency of their response to the pandemic, such as the United Arab Emirates, were able to ease restrictions relatively early.

Yet the coronavirus pandemic has accelerated pre-crisis trends and has placed the state of global trade in a more precarious position

In late 2019, the Organisation for Economic Co-operation and Development (OECD) noted that stagnating global trade was a severe impediment to economic activity in almost all major economies, as countries made adjustments to their supply chains and reallocated economic activity accordingly. The onset of the pandemic has accelerated this trend as the general value of supply chains has reduced in value, creating the prospect of reduced integration and openness in the future.

Competition as an organising principle should be favoured to avoid market distortions and enable future growth

Future economic prosperity is contingent on a competitive framework that enables new entrants to flourish and prevents incumbents from thwarting new technologies and entrepreneurship. Competitive markets with good governance allow for swifter economic transformation, inaugurating new sources of income that are often technologically advanced new industries.

Efficient trade facilitation is critical to maintain openness

It is of little surprise that countries with high degrees of economic freedom and ease of doing business – including the United Kingdom, United States, the United Arab Emirates, South Korea, and Singapore - are often economies that continually pursue more efficient means of trade facilitation.

Advanced Special Economic Zones (ASEZs) offer an opportunity for neural nodes to further prosperity

The creation of new ASEZs to build on the likes of City of London Corporation, or the Dubai International Financial Zone or Abu Dhabi Global Market offer an opportunity to further trade facilitation, build economic resilience and attract greater inward investment that would have the effect adding value to domestic, regional and global GDP.

Appraising the
Public Health Response

Eight days before the World Health Organization (WHO) declared the accelerating outbreak of the novel coronavirus (SARS-CoV-2) a pandemic, the Harvard Business Review carried a piece which implied that any recovery from the impending economic challenge was closely linked to the immediate efficacy of a country's public health response.[1]

Its authors described three recovery scenarios – 'V-shaped', 'U-shaped' and 'L-shaped' – which have since become common parlance.

Much of the analysis in the Harvard Business Review piece has transpired to be accurate. The nature of any nation's economic recovery – 'V-shaped' being the best-case scenario and 'L-shaped' being the worst case – rests on the level of pandemic preparedness, the stringency of lockdown and containment measures, and the capacity to withstand a second wave.

National Pandemic Preparedness

Established in 2019 as a joint project between the Nuclear Threat Initiative (NTI), the Johns Hopkins University's Center for Health Security (CHS), and the Economist Intelligence Unit, the Global Health Security Index (GHSI) is a 'comprehensive assessment and benchmarking of health security and related capabilities' across 195 countries.[2]

Relying on open source information, the GHSI covers six categories relating to health security preparedness. These categories are:[3]

- **Prevention** – The prevention of the emergence or release of pathogens
- **Detection and reporting** – Early detection and reporting of epidemics of potential international concern
- **Rapid response** – Rapid response to, and mitigation of, the spread of an epidemic
- **Health system** – Sufficient and robust health systems to treat the sick and protect health workers
- **Compliance with international norms** – Commitments to improving national capacity, financing plans to address gaps, and adhering to global norms
- **Risk environment** – Overall risk environment and country vulnerability to biological threats

In October 2019, the GHSI – surprising as it might now seem – ranked the United States and the United Kingdom as the two countries most prepared to manage and deal with a high consequence and globally catastrophic biological event, including, but not limited to, pandemics. Both nations scored consistently highly on all metrics, with the United Kingdom performing well in its stated ability to rapidly respond to, and mitigate the spread of an epidemic.[4]

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1 Philipp Carlsson-Szlezak, Martin Reeves, Paul Swartz. "What Coronavirus Could Mean for the Global Economy." 3 March 2020. Harvard Business Review. 20 August 2020.
2 GHS Index. "Developing the GHS Index." October 2019. GHS Index. 20 August 2020.
3 Ibid.
4 JHU Center for Health Security. Global Health Security Index. Baltimore: Johns Hopkins University, 2019. Pp. 20-29. (p.20)

While high-income and developed nations with long-standing public health contingencies were assessed to be best prepared, some emerging economies featured highly. Thailand, for instance, was judged second only to the United States in its ability to treat the sick and protect its health workers from threats to public health.

The GHSI was instructive in so far as it had identified key metrics of analysis and outlined, in a perfect environment – without the influence of political and administrative decisions – how nations should perform in the event of a public health crisis.

However, in view of how countries have actually performed under the conditions of the coronavirus pandemic, with particular reference to the United States and the United Kingdom – both of whom have recorded disproportionate cases and case fatalities respectively – it is worth stressing that the fundamentals of health security preparedness are likely to be revised.

This example is a reminder that any system has to be assessed, where possible, against real rather than ideal conditions, and that responses – as in the case of South Korea, Singapore and the United Arab Emirates – are as much to do with good governance and agile administrations as they are with respect to nominal healthcare assets.

As this report will describe later, high-income and developed nations are expected to suffer the most acute economic damage from the pandemic. The most likely to recover quickly are those nations able to exercise decisive leadership to adapt to new demands in public health response, most ostensibly in risk reduction, increased detection and transparent reporting, flexible healthcare capacity, and enhanced resilience and prevention.

Stringency of Lockdown Measures

The options for countries entering into national lockdown to prevent the spread of the virus were related to the stringency of measures undertaken. Countries that immediately put in place stricter lockdown measures were more likely to suppress the spread of the virus, and thus relax restrictions earlier. At time of writing, this early relaxation may have helped those nations avoid a secondary or tertiary outbreak of the virus and hence take the first steps on the path of a certain and stable economic recovery. Needless to say, this is still a matter of live debate between politicians, scientists, and epidemiologists. Any conclusions reached in this report are therefore provisional.

Analysis of data however supports a correlation between greater initial stringency and the ability to relax restrictions more rapidly. An ongoing study by the Blavatnik School of Government at the University of Oxford has formulated a Stringency Index based on individual government responses to the coronavirus pandemic. The index takes into account a set of fourteen indicators across three categories: containment and closure; economic response; health systems; and generates a resultant figure.[5] The higher the figure, the more stringent and robust a government's response to the pandemic has been at a particular time.

Country	Average Stringency Index Score				
	March	**April**	**May**	**June**	**July**
France	67.17	87.96	80.06	66.20	45.13
Germany	48.77	76.85	63.84	61.33	56.79
Singapore	32.26	75.37	82.80	68.27	53.16
United Arab Emirates	43.49	87.59	76.52	69.53	48.39
United States	45.77	72.69	72.69	70.71	68.98

Source: Covid-19 Government Response Tracker, Blavatnik School of Government, University of Oxford

When comparing a sample of leading high-income economies, those that accelerated the stringency of their response to the pandemic were able to ease restrictions relatively earlier. The United Arab Emirates for instance saw the biggest increase in its average stringency rating between March and April, which allowed for a gradual loosening of restrictions in the next two months, before settling on one of the lowest stringency scores among high-income leading economies.

This contributed to the United Arab Emirates' shorter lockdown period compared to other similar economies, by a factor of more than three weeks in the case of France and Germany, and more than eight weeks compared to Singapore.

A glance at the chronology of events in the countries concerned provides the Blavatnik tracker data further context. France enacted nationwide lockdown measures on 17 March 2020 and first eased restrictions in 11 May 2020. Germany followed an almost identical pattern in extending its lockdown from a regional to national level on the same day as France but loosened its restrictions a day earlier. As such, the Blavatnik tracker data shows that the German loosening was more extensive in the first instance but thereafter stalled relative to its neighbour. As a result, it is likely that Germany sacrificed potential increased economic activity, relative to France, between June and July.

However, it is worth noting that while France saw the highest average stringency score and followed a similar pattern to the United Arab Emirates in setting itself for a stable recovery, the advent of a second wave in August 2020 has made a return to greater stringency in France more likely.

5   Thomas Hale, Noam Angrist, Beatriz Kira, Anna Petherick, Toby Phillips, Samuel Webster. Variation in government responses to COVID-19. Working Paper. Oxford: Blavatnik School of Government, University of Oxford, 2020.

Making Sense of
an Uncertain Outlook

In its final economic outlook for 2019, the Organisation for Economic Co-Operation and Development (OECD) warned that stagnating global trade 'was dragging down economic activity in almost all major economies', where the 'induced reallocation of activities across countries and adjustments to supply chains' added a further drag on demand, weakening medium term growth prospects, as incentives to increase productivity and investment declined.[6]

Despite the sombre assessment, the OECD still forecast real GDP growth to remain at 2.9% in 2020, before picking up slowly in 2021.[7] That estimate, of course, was made before the Covid-19 outbreak.

The emergence of the novel coronavirus (SARS-CoV-2) in China's Hubei province at the end of 2019 would, in the space of three months, condemn the world to its second pandemic of the 21st century. [8] The outbreak of the coronavirus has spawned the most devastating public health crisis since the outbreak of the H1N1 influenza A virus in February 1918 which claimed up to 50 million lives.[9] The pandemic, and more significantly the response of governments to it, would quickly make the OECD's November 2019 judgment irrelevant.

The onset of the pandemic sent economists at the world's global financial institutions scrambling to assess the inevitable threat to growth and prosperity. In April 2020, the International Monetary Fund (IMF) published its World Economic Outlook. Entitled 'The Great Lockdown', the IMF estimated global output would decline by 3.0% in 2020, a factor of thirty times the contraction the global economy seen during the Great Recession of 2008-09, with its – normally judicious – Chief Economist Gita Gopinath declaring that 'this crisis is like no other'.[10]

As economic indicators worsened, unemployment in the United States rose from 4.4% to 14.7% over a four-week period, and further hasty revisions to forecasts ensued.[11] The IMF extant and current Outlook updated in June 2020, continued with its theme of 'A Crisis Like No Other', and thus forecast global output would decline by 4.9% in 2020.[12]

6   Organisation for Economic Co-Operation and Development. OECD Economic Outlook 2019. Paris: OECD, 2019. p.12
7   Ibid. 13
8   World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID-19. 11 March 2020. [Accessed: 4 August 2020].
9   Centers for Disease Control and Prevention. 1918 Pandemic - H1N1 Virus. 5 June 2018. [Accessed: 4 August 2020].
World Bank. COVID-19 to Plunge Global Economy into Worst Recession since World War II. 8 June 2020. [Accessed: 4 August 2020]
10   International Monetary Fund. World Economic Outlook, April 2020: The Great Lockdown. Washington, D.C.: IMF, 2020. p. v
11   U.S. Bureau of Labor Statistics. Civilian Unemployment Rate. June 2020. [Accessed: 4 August 2020]
12   International Monetary Fund. World Economic Outlook Update - A Crisis Like No Other, An Uncertain Recovery. Washington D.C.: IMF, 2020. p. 7.

	Forecasts (April 2020)				Forecasts (June 2020)	
	2018	**2019**	**2020**	**2021**	**2020**	**2021**
World output	3.6%	2.9%	-3.0%	5.8%	-4.9%	5.4%
Advanced Economies	2.2%	1.7%	-6.1%	4.5%	-8.0%	4.8%
Emerging and Developing Economies	4.5%	3.7%	-1.0%	6.6%	-3.0%	5.9%
United States	2.9%	2.3%	-5.9%	4.7%	-8.0%	4.5%
Singapore	3.4%	0.7%	-3.5%	3.0%	Unchanged	
United Kingdom	1.3%	1.4%	-6.5%	4.0%	-10.2%	6.3%
United Arab Emirates	1.7%	1.3%	-3.5%	3.3%	Unchanged	
South Korea	2.7%	2.0%	-1.2%	3.4%	Unchanged	

Real GDP percentage change year on year. Source: International Monetary Fund (IMF) April and June 2020 Outlooks

In the IMF's view, the only thing that was certain was uncertainty, and among the primary causes of that uncertainty was the widely differing economic resilience of countries in managing epidemic scenarios, as well as how supply chains would react to rapid reorientation and reconfiguration.[13]

This particular observation remains important in determining how high-income, leading economies, characterised by their nodal position within a global trading network, are forecast to perform over the next two years. While emerging and developing economies are expected to have a larger output at the end of 2021 than at the beginning of 2020, advanced economies, according to IMF figures, are to set to be 3.2% below pre-crisis levels. Across the select economies of the United States, Singapore, the United Kingdom, the United Arab Emirates and South Korea, this could amount to $813 billion in lower output.[14]

While there seems to be an emerging trend that developed economies will be hit hardest, there are some exceptions. The United Arab Emirates and Singapore for example are, over the course of two years, unlikely to experience a significant shift in output with GDP expected to be between merely 0.2% and 0.5% lower at the end of 2021 than at start of 2020.

Nevertheless, the OECD – focused as it is on its thirty-seven high income, high development index performing economies – has linked the unprecedented nature of the economic damage engendered by the coronavirus pandemic to an opportunity to reconfigure economies to drive future growth and prosperity.

In its latest outlook, beyond the immediate need to take effective public health measures to contain the transmission of the coronavirus, the OECD has urged governments to recalibrate economic activity to focus on high-income industries, strengthen and diversify supply chains, as well as facilitate rapid digitalisation and technological transformation. These measures are recommended to be supported through prudent fiscal and monetary measures with secure institutional backing.

What these OECD recommendations illustrate is that the pandemic has accelerated pre-existing trends. There will doubtless be increased reliance on technology, 3D printing and innovative artificial intelligence (AI). Investment in new or green industries has been assisted by the rapid decline in the demand for oil, as demonstrated by the swift expedition of renewable investment initiatives by Italy's energy giant Eni SpA and London-listed Royal Dutch Shell. Furthermore, European Central Bank president Christine Lagarde has signalled her view that the use of automation and robotics within the Eurozone will double in the next two years, providing greater efficiency to supply chains.

As the world looks to recover, building greater economic resilience to deliver growth and prosperity will be a primary objective for governments around the world. In pursuing this goal, new regulatory and technological arrangements, incubated and spawned during the pandemic, could be applied to specific deeply integrated, high-income regions to provide a working model to achieve these ambitions.

13   Ibid. 5
14   Calculated using 2019 World Bank GDP figures at current US$ prices. See World Bank Open Data - GDP (Current US$). 2019. [Accessed 4 August 2020].
15   OECD Economic Outlook June 2020 - The World Economy on a Tightrope. Paris: OECD, 2020.
16   Hurst, Laura. "Oil Slump May No Longer Be a Curse for Renewable Energy." 25 April 2020. Bloomberg. [Accessed 4 August 2020]
17   William Horobin, Alexandre Rajbhandari. "ECB's Lagarde Expects Disinflation as Crisis Transforms Economy." 4 July 2020.

Global
Neural Networks

The global trading system is a complex system, more like a complex biological system than a simple linear mechanical system. A useful analogy for thinking about the global economy is the human brain, with different neurons and synapses firing at different times and for different purposes.

Human neurons are of three types: sensory neurons, interneurons and motor neurons. Sensory neurons respond to physiological stimuli such as light, sound or our sense of touch and send signals to the spinal cord or brain to process. Motor neurons then carry the brain's response to instruct anything from muscle contractions to glandular activity, where interneurons connect neurons within the same region.

The world's economies largely mimic these processes in terms of their transactions and structural formation, and it is therefore possible to model the global trading system in the same way as the human brain. Small,

resource-based, developing economies reflect interneurons. Their connections are highly localised and their relationship with other entities confined to a particular geography that does not directly extend to other regions. The East African Community (EAC) of nations such as Kenya, Tanzania, Uganda, Burundi, Rwanda, and South Sudan fits this arrangement through its incipient customs union and nascent common market.

The engine rooms of output and the large industrial powerhouses are akin to motor neurons, in so far as they exploit their large resource of cheaper labour to utilise imported technology and expertise to deliver

mass market consumables in the service of external investors or economic stimuli. Nations such as Brazil, Russia, India and until recently China fit into this category, but may also include Vietnam, Indonesia, Mexico and Bangladesh among them. It is not to say these individual nations are not capable of developing their own technology, rather they benefit from a Kondratiev wave-like effect as new generations of technological development assist in their rapid economic transformation.

Sensory neurons reflect a final category of highly-integrated, knowledge-based, high-income economies. While countries such as the United States and the United Kingdom have long occupied this position, they have been joined in recent decades by the likes of the United Arab Emirates, South Korea, and Singapore, places which have demonstrated rapid growth by combining good governance (for an example of the rapid growth of the latter, see chart).

These economies are at the forefront of technological and knowledge-based development and are most effective in responding to shifting trends and patterns to develop technological, regulatory, and systemic solutions to confront challenges on a global scale. They are highly-integrated and diversified, and are connected by the same resilient trading networks, sharing more in common with each other than those in their immediate geographical vicinity.

It is among these nations that the prospect and neural instruction for growth is found, and thus it is crucial to examine what makes these particular nations successful, especially as the world emerges from the devastating economic impact of the coronavirus pandemic. Most urgently, these nations have to be protected from 'economic Parkinson's', as their function as sensory neurons in a global economy can degenerate without continuous stimulation and leave whole ecosystems stuttering.

Singapore GDP (Current $)
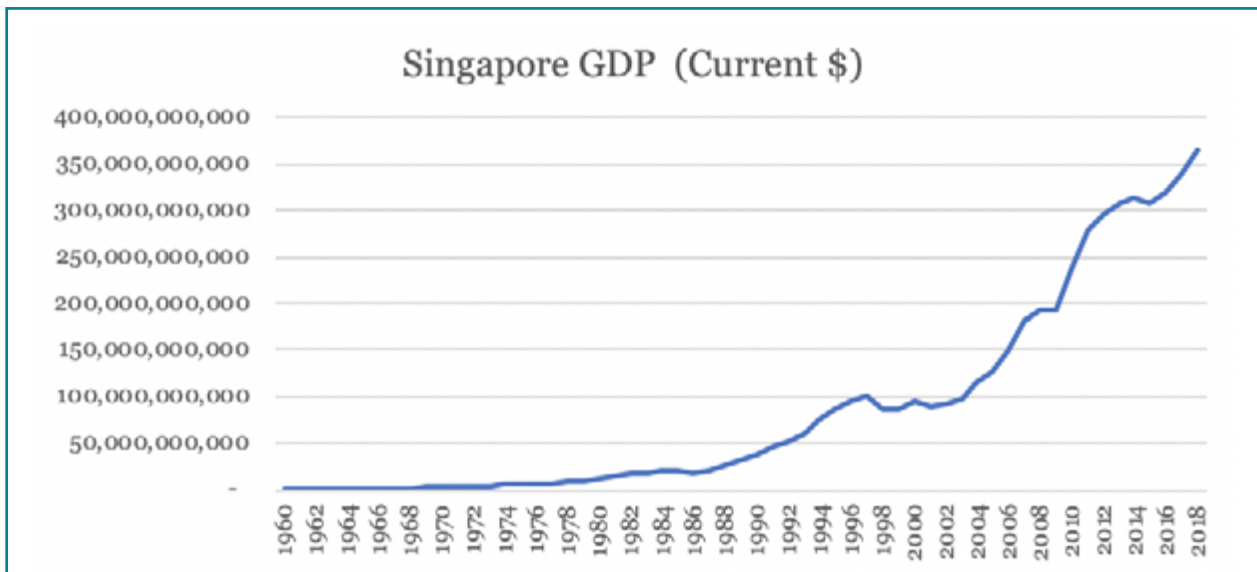
The Pillars of Economic Resilience

Entrepreneurship and Competitive Markets

There is an emerging premier league of these neural nodes around the world. The United Kingdom, United States, Singapore, South Korea, and the United Arab Emirates collectively possess the fundamental building blocks to be economically resilient in the face of the coronavirus pandemic.

As noted in the previous chapter, the coronavirus pandemic is expected to have a marginal, if not negligible effect on output in the United Arab Emirates and Singapore over a two-year period, even as fellow leading economies experience a double-digit decline in output in 2020.

The degree of this economic resilience stems from a number of factors that relate to the composition of both of these economies. A key issue in this regard is the competitiveness of these markets. But, it is not just about competitiveness but critically whether they are governed by fair competition on its merits as an organising economic principle, and not government distortions. All of these key markets share that commitment to competition, which enables new entrants to flourish and prevents incumbents from thwarting new technologies and entrepreneurship.

Over the past few decades, authorities in the United Arab Emirates have made a concerted effort to diversify its primary income sources away from oil and petroleum. In line with the ambitious targets set out by the country's Vision 2021, the United Arab Emirates has committed to expanding its non-oil sectors to comprise at least 80 per cent of gross domestic output. As of 2017, oil and natural gas contributed to less than 30 per cent of the country's income and has been steadily declining amid the rapid rise of knowledge driven industries relating to technology and healthcare innovation.

In similar fashion, Singaporean authorities made significant interventions in the early 1990s as modest growth rates began to stall, inaugurating a public-private investment-led and high capital ratio economic strategy that gave rise to a number of highly profitable enterprises. Singapore has also capitalised on its geographical location within the high-growth nations in the South East Asia region to emerge as a trading hub and pricing hub for the exchange of commodities, thereby facilitating its status as a global financial hub and experiencing significant inward investment from overseas.

Some have suggested that the Singapore model is an argument for state-led growth, but this misunderstands the nature of a city state where State Trading Enterprises like Temasek are much more like private profit maximisers with the oversight of a corporate board. This is because the governance structure of city states is more like a corporate governance structure with a strong CEO (as in the case of Singapore).

Similarly, the City of London Corporation has strong governance and reliance on private-public partnerships. However, what works for a city state would not necessarily work for a nation state. Instead countries should resist anti-competitive market distortions, and promote competition on the merits and voluntary exchange, as the US and UK have done in the past (especially in their high growth phases after the Second World War for the US, and in the 1980s for the UK and US).

Diversification to build long-term resilience in the United Arab Emirates and Singapore has resulted in both economies forging an entrepreneurial and highly-competitive environment. IMD's World Competitive Centre ranked both economies in the top ten, alongside established competitive leading economies including Hong Kong and the United States. While London and New York remain the top two positions in the Global Financial Centres Index (GFCI), Singapore and Dubai are continuing their rise to settle among the top ten centres with their performance among key indications exceeding the likes of Geneva, Frankfurt, Zurich and Paris.

Sophistication of Governance and the Commitment to Property Rights Protection

Sophistication of governance, the presence of strong institutions which communicate a fundamental protection of property rights, is a shared feature among these nations. Singapore is an example of how a clear resilience-based strategy contributes to good governance in the context of the proper role of government. As a general principle, governments should intervene in markets to protect security, property rights and to ensure market failures are properly addressed but should refrain from other distortive activity. We should also note that city states such as Singapore are able to deploy government in different ways to countries as they are more like corporate entities. The City of London Corporation is one such example. Indeed, some of these city states have more in common with the Prosperity Zones we refer to later in this report.

In essence, the successful approach is only to exercise intervention to shift regulatory or structural arrangements when the principles of a free economy are threatened. As such, the environment for business to operate in remains familiar, constant and consistent, where authorities undertake the responsibility to ensure a high degree of economic participation through fiscal measures. For example, the government can and should intervene in a market to curb anti-competitive practices in the private sector or to correct a pre-existing anti-competitive government distortion.

The United Kingdom and United States are examples of countries that regulate in ways that seek to minimise negative trade and competition effects consistent with a legitimate publicly stated regulatory goal. Legitimacy is conferred by the democratic process. As such, regulatory frameworks are a consensual process which guarantees both a commitment to liberalised economies with adequate regulatory and social protections for consumers and citizens, as those citizens see fit when acquainted with the regulatory costs. The United Kingdom and United States economies have – at least until recently – grown through privatisation and deregulation, using the governance structure to translate the force of competition to unleash the wealth creating potential of the private sector.

In the United Arab Emirates, the government has regularly merged ministries, created new portfolios and retired outdated posts in order to provide effective and efficient management of the country's economic affairs. In July 2020, after having implemented one of the most comprehensive public health responses to the coronavirus pandemic, the United Arab Emirates Government carried out a reshuffle of its cabinet to drive a more agile decision-making process. The reshuffle saw the creation of the Ministry of Industry and Advanced Technology and promoted newer products of the United Arab Emirates' knowledge driven bureaucracy.

Openness and Connectivity

Another pillar that contributes to the success of these sensory-type economies is their openness. The World Bank's annual Doing Business Report has for the last five years categorised the

United Arab Emirates, United Kingdom, United States, Singapore, and South Korea as 'Very Easy' places to conduct business. In light of the report's methodology and criteria, these economies have among the lowest barriers to setting up businesses, attaining permits, registering property, protecting investors, trading across borders and enforcing contracts.

The ease of doing business thus corresponds to a high degree of economic freedom that allows innovation to flourish. Singapore has for the least two years occupied either first or second place respectively in the Heritage Foundation's Index of Economic Freedom, and the United States and United Kingdom score in the top ten in Boston Consulting Group's International Innovation Index. The latter index measures countries according to their innovation inputs, such as fiscal measures, education policy and R&D investment measured against their outputs of patents, technology transfer, and labour productivity.

The doing business index is only part of the story of openness. The other parts relate to the openness of their trading regimes. This in turn is divided into the substantive openness of their regimes (with low tariffs and other border barriers), and the procedural openness which is related to how they facilitate trade. Singapore and the United Arab Emirates have historically been very open economies with a heavy reliance on, and encouragement of, imports. Conditions of domestic competition and internal regulatory systems should not thwart the goals of an open economy, but instead should facilitate them.

Trade facilitation relates to the procedural aspects of trade openness. Trade facilitation seeks to eliminate unnecessary delays and associated time penalties, foregone business opportunities and reduced competitiveness that can result from border management procedures, controls, and checks. It examines how procedures and controls governing the movement of goods across national borders are managed and can be improved

to reduce costs while maximising efficiency and safeguarding legitimate regulatory objectives. Bureaucratic delays and red tape are a burden on traders moving goods across borders. The simplification, modernisation, and harmonisation of export and import processes has emerged as an important issue for the world trading system.

Countries that score well in surveys of ease of doing business and economic freedom also score well in terms of efficient and low-friction borders. The United Kingdom, United States, Singapore, South Korea and the United Arab Emirates are all within the world's top 15 economies in the World Bank's Logistics Performance Index which places a significant focus on the time and cost of border procedures. Trade facilitation is particularly important for developing countries hit hardest by the coronavirus crisis. Ninety per cent of future global growth is predicted to take place outside Europe. SMEs with their significant role in global supply chains are predicted to be well placed to take advantage of this trend, fostering trade inclusiveness and opportunity for all. For people in emerging economies, trade agreements with the rest of the world help alleviate poverty and put them on the pathway towards stability and prosperity.[18]

In the current coronavirus crisis, trade facilitation has been critical in ensuring the swift movement of essential medical, food, and IT supplies. In a global crisis, international co-operation in trade facilitation is critical to keep trade flowing. However, we are moving into a post-pandemic environment where trade facilitation and trade have an equally important role to play in the world's financial recovery.

In 2013, WTO members concluded negotiations on the Trade Facilitation Agreement (TFA), and the instrument entered into force on 22 February 2017. The TFA contains provisions for expediting the movement, release, and clearance of goods, including goods in transit. It also sets out measures for effective cooperation between customs and other appropriate authorities

18   European Commission. "Economic Partnerships - EU Trade Policy and ACP Countries: Benefits of EPAs." 19 February 2020. European Commission.

on trade facilitation and customs compliance issues. It further contains provisions for technical assistance and capacity building in this area.

The risk of increased global protectionism as a result of trade wars and the recent pandemic crises can lead to a loss of the benefits brought about by previous trade liberalisation. Global real incomes will potentially fall and there would be a risk that the supply of goods and services would diminish. All in all, increased protectionism would impede the global output of goods and services and would reduce demand for exports.

> *'While declining trade is largely a reflection, not a cause, of the current economic contraction, rising trade costs – from transport, logistics and supply chain disruptions, as well as additional border controls and documentation requirements – act as additional brakes on both trade flows and the global economy. The World Trade Organization (WTO) forecasts the fall in world merchandise trade to be larger than the decline in GDP, with estimated declines ranging from 12% to 32%, given the high degree of uncertainty about the duration and severity of COVID-19 and the measures necessary to contain it. The rise in trade costs from additional border controls, transport and associated logistics-related disruptions is estimated to account for up to a third of this decline'.*[19]

This leads to a situation where trade facilitation for both developed and developing countries is more important than ever. However, current initiatives are not enough. The world needs new powerful innovative ideas and creative solutions in trade facilitation. It is especially in need of a new paradigm that can foster trade facilitation ideas and create new drivers for global trade recovery and the global economy. While we are already seeing new trade superhighways emerge, connecting different parts of the world, we also need a new level of

infrastructure and supporting engines to drive this development faster and more efficiently creating a future global megatrend.

Technology and knowledge transfer are particularly significant for these nations. Given that the United Kingdom, United States, Singapore, and the United Arab Emirates are service-oriented economies, there exists a high degree of mobility between them, both in terms of knowledge transfer and movement of human capital. It is of little surprise therefore that London, New York City, Dubai/Abu Dhabi, and Singapore are highly-connected travel hubs where business travellers, consultants, lawyers and investors transit.

Openness of economies has both an inbound and an outbound perspective. As the inbound openness is generated by low-entry barriers and an optimisation of domestic trade flows, the outbound openness is characterised by the connectivity of an economy as a cyber-physical system. Physical aspects of connectivity include geographical advantages and very practical elements of mobility, including travel connections and even the export of services in the form of expats eating in international restaurants in certain hubs.

Real competitive advantage, however, can be gained by optimizing the virtual connectivity of an economy, which depends much less on geographical restrictions. Virtual connectivity covers smart vehicles for a fast, safe and stable connection to global trade flows and supply chains. It allows the capitalisation of an economy's global network and it provides an intelligence ecosystem to match resources, feedstock, technologies and entrepreneurial spirit from corresponding business hubs all over the world. Leading economies represent a quality standard of such connectivity; and the coronavirus pandemic reveals its outstanding value.

However, openness can allow crises to expose vulnerabilities. While the tragic events of September 2001 facilitated a

19   Organisation for Economic Co-Operation and Development, "OECD Policy Responses to Coronavirus (COVID-19): Trade facilitation and the COVID-19 pandemic." 22 April 2020. OECD. p. 2
s Transforms Economy." 4 July 2020. Bloomberg. [Accessed 4 August 2020]

slump in domestic and global air travel, the current coronavirus pandemic is likely to have a longer lasting effect, presenting a unique challenge for these hubs. It therefore falls to confidence inducing and ultimately effective public health procedures to ensure the channels for technology and knowledge transfer continue to operate. As open economies are vulnerable economies, well-connected ones are more resilient. After the pandemic, the neural network of globalisation will produce new hubs, and a new generation of Special Economic Zones will benefit from their effectiveness.

The Role of Prosperity Zones

At the global interfaces of well-established economic areas, there is a strong need for Prosperity Zones (PZs) to coordinate and leverage the productivity of high-tech economies. Prosperity Zones represent the benefits of Advanced Special Economic Zones (ASEZs), such as the Special Economic Zone at Duqm, or Panama Pacifico. Some exist within cities like the City of London Corporation, or the Dubai International Financial Zone or Abu Dhabi Global Market. These have special rules above and beyond their localities. There exists a premier league for such zones as well, however, most of them still underperform in attracting global capital for investment. As noted above there is a deep correlation between these PZs and the city states that are increasingly important nodes in the global economy, and will play an even more important role post-pandemic.

It is important to understand what elements are critical in terms of best practice that make these ASEZs successful. In a microcosm, the same issues are at play in these ASEZs as in wider countries. The three pillars of property rights, competition and openness to trade are crucial. These three pillars need to be communicated or channelled by sound governance structures.

Each of the ASEZs mentioned are particularly strong in different areas. For example, in the

Special Economic Zone at Duqm (SEZAD), the Omani authorities have identified the key areas where there are impediments to investment and trade in Oman and have taken concrete actions to solve for these problems. In Oman, there is a 35 per cent Omanization requirement that firms' workforce must be 35 per cent Omani. This is a well acknowledged barrier to investment and trade. Thus, the Omani authorities have lowered that requirement to 10 per cent in the case of the SEZAD. Similarly, Oman maintains a dealer protection law that gives enormous protection to local distributors and damages the interests of foreign suppliers. This is also an acknowledged trade barrier. The Omani government has eliminated this law for the SEZAD. In both cases, it would be very difficult for the country to change these laws for the country as a whole, and so it is advantageous to change them only for the zone. In Panama Pacifico, there are special rules on temporary movement of workers which enable the financial services sector in Panama to flourish. Once again, these would be impossible to provide at the national level, but on a zonal basis they are possible.

Other zones have established significant easements in business foundation processes, interaction with public authorities or tax regulations. Some represent a high level of safety and security while others offer a special standard of living and personal freedom. All of them act as a game-changer within their national economies: they do not succeed by attracting tax savers or speculative businesses, but by enabling regional market participation in a 'safe harbour'. They attract companies with an existing business interest in the region but may fear entering into an unknown economy.

Prosperity Zones will apply the same strategy to attract investors with multiple business interests along global trade superhighways. They are not game changers to a dysfunctional national economy but contribute to the ease of doing global business. Freeports, such as those contemplated by the post-Brexit UK government, urban trade hubs and broader industrial areas will develop their own standards of facilitating global supply and trade in post-coronavirus globalisation. Their

tenants do not invest solely in order to enter into the domestic economy, but in order to gain the best position along global trade roads. The value added for the regional and domestic GDP, produced by these investments, is, however, much higher than the outcome of any 'Invest in my Country' campaign. The financial hub of London is an allegory for these types of PZs, and so is the entire history of the UK's foreign economic policy.

Prosperity Zones will emerge in China and Southeast Asia, and they may emerge in Europe, subject to public consent. Their individual success as new arenas for globalisation will depend on the quality of their connectivity standards, the sophistication of their governance structures and their resilience as the product of both components. In the UK, the creation of freeports could be a strong opportunity to establish a UK Prosperity Zone standard. They could become cyber-physical hubs of a post-Brexit foreign economic policy. They may also have special rules on planning where there is an acknowledged problem with respect to UK planning law which the PZs could help solve. There are other areas where there is a lack of competition in various key sectors in the UK which could be solved in the freeports, including using regulatory sandboxes for fintech products, banking products, as well as in the areas of energy and transportation regulation where anti-competitive government restraints operate.

Conclusion

The countries that are well positioned to come out of the coronavirus pandemic in a more resilient position are those that build on the acceleration of the pre-existing global trends towards the use of technology, innovation, the judicious use of Prosperity Zones, and those countries that maintain or develop open trading systems, competition based regulation and property rights protection delivered by good governance mechanisms. The use of PZs can ensure the necessary visibility into nodes on global supply chains so that these global supply chains can be better managed in the future.

There will be a premium on private sector wealth creation as governments will have unsustainable levels of debt. Only by delivering in these key elements will a country or city state successfully plant itself along the global trade superhighways of the future which will enable resilient economies to survive the crisis and flourish into the future.

References

Centers for Disease Control and Prevention. 1918 Pandemic - H1N1 Virus. 5 June 2018. 4 August 2020. <https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html>.

European Commission. "Economic Partnerships - EU Trade Policy and ACP Countries: Benefits of EPAs." 19 February 2020. European Commission. 14 August 2020.

GHS Index. "Developing the GHS Index." October 2019. GHS Index. 20 August 2020.

Hurst, Laura. "Oil Slump May No Longer Be a Curse for Renewable Energy." 25 April 2020.

Bloomberg. 4 August 2020. <https://www.bloomberg.com/news/articles/2020-04-24/oil-slump-may-no-longer-be-a-curse-for-renewable-energy>.

International Monetary Fund. World Economic Outlook Update - A Crisis Like No Other, An Uncertain Recovery. Washington D.C.: IMF, 2020.

World Economic Outlook, April 2020: The Great Lockdown. Washington, D.C.: IMF, 2020.

JHU Center for Health Security. Global Health Security Index. Index . Baltimore: Johns Hopkins University, 2019.

Organisation for Economic Co-Operation and Development. OECD Economic Outlook 2019. Paris: OECD, 2019.

OECD Economic Outlook June 2020 - The World Economy on a Tightrope. Paris: OECD, 2020.

"OECD Policy Responses to Coronavirus (COVID-19): Trade facilitation and the COVID-19 pandemic." 22 April 2020. OECD. 14 August 2020.

Philipp Carlsson-Szlezak, Martin Reeves, Paul Swartz. "What Coronavirus Could Mean for the Global Economy." 3 March 2020. Harvard Business Review. 20 August 2020.

Thomas Hale, Noam Angrist, Beatriz Kira, Anna Petherick, Toby Phillips, Samuel Webster. Variation in government responses to COVID-19. Working Paper. Oxford: Blavatnik School of Government, University of Oxford, 2020.

U.S. Bureau of Labor Statistics. Civilian Unemployment Rate. June 2020. 4 August 2020. <https://www.bls.gov/charts/employment-situation/civilian-unemployment-rate.htm>.

William Horobin, Alexandre Rajbhandari. "ECB's Largarde Expects Disinflation as Crisis Transforms Economy." 4 July 2020. Bloomberg. 4 August 2020.

World Bank. COVID-19 to Plunge Global Economy into Worst Recession since World War II. 8 June 2020. 4 August 2020. <https://www.worldbank.org/en/news/press-release/2020/06/08/covid-19-to-plunge-global-economy-into-worst-recession-since-world-war-ii>.

World Bank Open Data - GDP (Current US$). 2019. 4 August 2020. <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID-19. 11 March 2020. 4 August 2020. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.

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