EAST ASIA FORUM Quarterly

ECONOMICS, POLITICS AND PUBLIC POLICY IN EAST ASIA AND THE PACIFIC

Vol.14 No.2 April–June 2022 $9.50

Asia's Digital Future

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EAST ASIA FORUM
Quarterly

ISSN 1837-5081 (print)
ISSN 1837-509X (online)

From the Editors' desk

Once, the internet and world wide web promised a world of seamless connectivity for anyone with access to a digital device. As connectivity costs fell, the workplace became mobile, and digitalisation transformed industrial sectors, the laissez-faire agenda of digital developmentalists appeared to align with and promote democratic ideals.

That was then. Today, even as cloud computing and digital transformation agendas have become mainstream, it is clear the threat of digital fragmentation must be actively addressed. As different rules around privacy, cybersecurity and digital sovereignty emerge to thwart interoperability, fragmentation is impacting both governance and infrastructure. Digital borders in China, cross-border data restrictions in Europe and America's disavowal of Chinese telecom equipment make for increasing disconnection.

What does the future look like? Competing digital blocs reflecting mercantilist history? Or an interoperable environment, that blends the opportunities of e-commerce and artificial intelligence with the analogue realities of a carbon-based economy into some type of 'metaverse'?

Asia is not sitting idle. Much of the early effort towards working solutions has taken place among the region's multilateral fora. The regional E-Commerce Agreement ASEAN signed in 2019 established common principles and rules for e-commerce growth and potentially heralds a digital 'common market.' ASEAN's Model Contractual Clauses for cross-border data transfers, adopted in 2021, breaks ground by enabling ASEAN markets to trade in sensitive data without disrupting domestic privacy requirements.

The Digital Economic Partnership Agreement struck by Singapore, New Zealand and Chile, and the Singapore–Australia Digital Economy Agreement focus on enabling digital trade and the necessary components of digital transformation. It's still too early to assess whether there's alignment across the frameworks—or if they are a panacea for digital fragmentation.

But Asia shows that finding commonalities is possible. The articles in this *EAFQ* examine where commonalities are possible in the digital economy, and where we may expect more clashes than cross-cutting frameworks. We face an opportunity to choose the latter for the next generation of trade application. Each article explores a particular component of that choice.

Meanwhile, our Asian Review articles remind us that state owned enterprises in developing Asian countries can play a bigger role in green financing and that Indonesia's G20 presidency is crucial to global food security. These are additional opportunities for Asia to find commonalities.

Peter Lovelock and Dini Sari Djalal

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COVER PHOTO: Visitors are immersed in an installation, *Machine Hallucinations - Space: Metaverse* by Refik Anadol. The artwork will be converted into Non Fungible Token for auction at Sotheby's Digital Art Fair in Hong Kong (2021). PICTURE: REUTERS / TYRONE SIU

PICTURE: THE YOMIURI SHIMBUN

Digital signs saying 'state of emergency' welcome commuters to Tenjin shopping mall in Fukuoka City (Kyushu, 2021).

Towards an Asian digital trade zone

ANUPAM CHANDER

ARE the Himalayas too high for the internet to pass? The prospect of an Asian digital single market seems remote, especially when India and China seem to be pulling apart. India is busy banning Chinese apps such as TikTok, while China promulgates ever stricter rules on data transfer abroad. Asian governments still fail to see that rising above local conflicts might yield enormous dividends to their people, strengthening their own economic security in the process.

Digital single markets permit consumers and businesses to engage with each other across national borders via the internet. They enable broad supply chains, build companies that can compete at a global level and reduce prices for consumers and businesses. Digital single markets help small businesses by reducing prices for key services from design, marketing, customer relations and accounting to hiring employees in foreign countries. But achieving a digital single market is not easy. It requires a degree of regulatory integration that few countries are prepared for, so nations typically agree to abide by the country-of-origin principle, allowing a company to operate across regional markets under the rules of its home country.

Many of the benefits of a digital single market can be achieved through a digital trade zone. Digital trade zones do not require the high degree of regulatory integration or recognition required by digital single markets. Digital trade zones require

EASTASIAFORUM
Quarterly

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ANU PRESS

Published by ANU Press
The Australian National University
Canberra ACT 2601, Australia
Email: anupress@anu.edu.au
Web: http://press.anu.edu.au

the dismantling of barriers to trade, but still oblige companies to abide by the laws of the countries where they do business. While digital single markets potentially offer greater dividends in terms of reducing costs for businesses, regulatory integration requirements mean that they are often a distant ideal.

Continent-wide digital markets can be enabling, boosting local businesses and consumers in a myriad of ways, including through the reduction of inflationary pressures. Without an ambitious agenda promoting digital trade, Asian countries risk falling behind and being relegated to providing digital services within shrinking geographies. They also risk being shut out of digital services in many foreign countries.

Many Asian countries have been reluctant to liberalise digital trade for two major reasons. Because of its impact on customs duties and to protect local enterprise.

India and other developing countries worry that barring customs duties on electronic commerce reduces much-needed revenues. This is understandable given that the fiscal challenges faced across the developing world have worsened with the pandemic. This worry may be alleviated by a new OECD-led agreement that requires large multinationals to pay at least a 15 per cent tax in countries where they make money. Furthermore, a customs moratorium does not bar internal taxes that are applicable to both foreign and domestic suppliers, and do not single out the internet.

Many countries also fear that their domestic industries will wither in the face of foreign competition if digital trade is liberalised. This approach risks protecting a few producers while sacrificing broader economic interests. Antitrust authorities need to be vigilant that foreign (and domestic) companies do not engage in abusive practices to prevent competition. One key to helping domestic enterprise to grow will be foreign investment, but governments continue to view foreign investment with caution.

Another concern, national cybersecurity, can be dealt with through exceptions or reservations. Cooperation among Asian countries could in fact strengthen cybersecurity for consumers and businesses by allowing for united responses to ransomware and hacking incursions. Fintech providers can make larger investments in cybersecurity if they have larger markets to serve.

SOME Asian countries have moved towards greater digital trade. Brunei, Japan, Malaysia, Singapore and Vietnam are all members of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), which includes a significant e-commerce chapter. Japan has entered into a Digital Trade Agreement with the United States. Singapore is leading on digital trade through a Digital Economy Partnership Agreement with Chile and New Zealand. The Regional Comprehensive Economic Partnership's (RCEP) e-commerce chapter, however, has no dispute resolution provisions, resulting in obligations without obvious enforcement mechanisms.

Meanwhile, the world is forging agreements that will create continental markets for digital trade. The European Union launched its digital single market strategy in 2015. North America is building towards a digital trade zone among its biggest economies, with an ambitious digital trade chapter in the US–

Mexico–Canada (USMCA) free trade agreement. The African Union has begun negotiations for an e-commerce protocol to the African Continental Free Trade Area. Latin American nations in MERCOSUR and the Pacific Alliance have adopted treaties with digital trade commitments.

Even while some nations commit to open digital trade with each other, they are simultaneously erecting barriers to others. Customs duties, professional licensing requirements, data localisation, data privacy laws, and liability rules all pose significant hurdles to cross-border digital trade. The 2020 decision of the Court of Justice of the European Union in *Schrems v. Facebook* requires that most data transfers to Asian companies undergo expensive impact assessments that ask, for example, whether the Asian country offers redress rights for foreigners with respect to any local surveillance. This greatly complicates transfers to nations in Asia. One mechanism to ease data flows is a ruling of adequacy with respect to data privacy from the European Commission, but Japan and South Korea are among the very small number of countries in the world that have thus far received such favourable treatment.

Regional arrangements allow governments to pool resources to regulate internet companies. Examining claims of artificial intelligence providers, evaluating cybersecurity protections and auditing privacy practices can all be more readily managed via government cooperation. The Brussels Effect, where EU regulation plays an outsized role, relies on the size of the enormous market that EU regulators can offer to companies that comply with EU standards.

Asian countries should consider how broadening markets will create opportunities across the region. The Himalayas, despite their majestic height, should not prove impassable for the internet. EAFQ

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PICTURE: REUTERS / SAMUEL RAJKUMAR

A worker uses automated guided vehicles at Flipkart, a leading e-commerce firm in India, to sort items inside its fulfilment centre (Bengaluru, 2021).

PICTURE: BUDRUL CHUKRUT / SOPA IMAGES / SIPA USA

Billboards for digital payment services target commuters and shoppers along Kowloon's main thoroughfare, Nathan Road (Hong Kong).

Integration, interoperability and inclusion

KATI SUOMINEN

EAST Asia is in the midst of a historic e-commerce boom. Online transactions of goods and services grew rapidly during COVID-19 lockdowns, at 58 per cent per annum in the Southeast Asian region alone in 2020. In 2022, the Philippines, Indonesia and Vietnam are expected to rank among the top five fastest growing e-commerce markets in the world. China remains the region's largest business-to-consumer e-commerce market, with more than 50 per cent of retail sales made online.

East Asia's online buyers and sellers are buoyed by a vibrant ecosystem of digital trade services, such as e-commerce marketplaces, digital payment and fintech services, logistics platforms and so-called 'super-apps' that provide users with services including delivery, shopping and ride-hailing.

Businesses are realising the opportunity that e-commerce presents, mounting online stores and onboarding marketplaces to reach hundreds of millions of global buyers. In ASEAN countries two-thirds of

micro and small firms use the online shopping platform Shopee, about half use Lazada, and over a quarter use Amazon. Midsize and larger firms are widely using global marketplaces like Amazon and Alibaba as well as direct-to-consumer platforms such as Shopify. This has translated to cross-border e-commerce and digital trade. More than 60 per cent of microenterprises that sell on global online marketplaces now export, with half of them commencing export because of e-commerce. Online seller–exporters are also more likely than offline sellers to export to multiple ASEAN and extra-regional markets.

The surge in business-to-consumer e-commerce is paralleled by the strong growth of cross-border business-to-business e-commerce as business-sellers seek to create omnichannel experiences for business purchasing managers. Digitally deliverable business-to-business services exports are also growing, at 16 per cent per annum between 2007 and 2020 in the ASEAN region alone, far exceeding the robust growth of the commercial services trade. As a result, the region's digital service providers are more deeply integrated in Asian and global value chains.

The adoption of policies and practices by regional governments that are conducive to e-commerce—such as e-payment laws, e-export promotion programs and financing for online small and medium-sized enterprises—have further bolstered the e-commerce surge. Governments in the region have long pursued regional e-commerce workstreams in the context of ASEAN and APEC alongside pathbreaking free trade agreements that unite regional economies with extra-regional partners to promote digital trade. Some of these include the US–Japan Digital Trade Agreement, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the Singapore–Australia Digital Economy Agreement and the Digital Economy Partnership Agreement.

GOVERMENTS across East Asia, however, have much work ahead of them to translate this wave of e-commerce adoption into digital trade opportunities for regional firms and economies. Over a third of Southeast Asian sellers report struggling with the region's fragmented digital regulatory landscape. The complexity of national data privacy, consumer protection and other digital regulations are daunting to meet in just one market, let alone in multiple markets. Firms also worry about potential data localisation undermining cross-border e-commerce. This is unsurprising with online seller–exporters widely using data on foreign customers and operations to upgrade services and streamline sales.

East Asia's prolific payments innovation is yet to be matched by payment system interoperability. About one-third of regional firms report losing online export sales as they are unable to accept payments from foreign customers. Elevated cross-border logistics costs, the orchestration of business-to-business logistics, accompanying paper-based trade documents and end to end payments also present significant challenges to firms.

These obstacles point to the need for a clear regional policy agenda to promote digital trade. Regional economies need to promote greater convergence among national digital regulations to facilitate smaller firms' compliance with national regulations in online markets. Further accessions of regional economies to the CPTPP and other trade agreements with binding e-commerce rules can promote regulatory convergence and lock each economy into standardised rules for digital trade. The intention of ASEAN economies to negotiate a Digital Economy Framework Agreement is a potentially positive step towards robust and binding rules that promote e-commerce.

East Asian governments… have much work ahead of them to translate this wave of e-commerce adoption into digital trade opportunities for regional firms and economies

East Asian firms engaging in digital trade will also require fluid access to data on their operations and customers and the ability to store, process and analyse data cost-effectively. Yet, the US Trade Representative's 2022 report on foreign trade barriers highlights several practices in countries such as Indonesia and China that run counter to aspirations for free data flows. ASEAN's Model Contractual Clauses for Cross Border Data Flows is a step in the right direction to promoting orderly cross-border data transfer. East Asian economies can consider joining the APEC Cross-Border Privacy Rules System, which balances the objectives

of data accessibility with data security and privacy. Promoting the broad-based use of privacy-preserving encryption and confidential computing technologies can complement these policies and help avert draconian data privacy and transfer laws.

Ongoing efforts to promote payments and logistics interoperability must be continued and regionalised further. Robust bilateral and multiparty real-time payment interoperability pilots already exist in the region. Payment interoperability initiatives and the ongoing adoption of ISO 20022 standards aim to streamline communications among national payment systems. Project Dunbar, a multi-central bank digital currency pilot, may herald a new era for low-cost and efficient cross-border payments.

In trade logistics, consortia that leverage blockchain ledgers to promote interoperability and lower end-to-end shipments times and costs can facilitate efficient, cost-effective and greener trade transactions. But this must be in parallel to accelerated government adoption of paperless trade practices.

Deeper integration of markets, implementation of digital trade commitments, and improved interoperability of payments and logistics services will all help East Asian online sellers to expand sales. Integrating small firms, remote sellers and a growing army of creators into new markets will enable more inclusive trade—and produce the greatest gains from digital commerce. EAFQ

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Integrating networks for regional trade agreements

PINDAR WONG

MANUFACTURERS in East Asia now have the option to settle trade under three major trade frameworks: the Regional Comprehensive Economic Partnership (RCEP), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Indo-Pacific Economic Framework. Will they continue to use the US dollar as the de facto unit of account for financial settlements, or will they choose cryptocurrencies like Bitcoin, or Central Bank Digital Currencies (CBDCs) such as China's e-CNY?

If life follows art, it is not hard to imagine a splintered world and political economy akin to George Orwell's dystopia in *1984*—a world divided into three global networks belonging to the states of Oceania, Eurasia and East Asia. In reality these could be divided by major CBDCs—a digital dollar, a digital euro and a digital yuan—with the digital 'gold' of Bitcoin perhaps serving as the currency for 'disputed territories'. The Japanese art of joining broken bowls with gold, *kintsugi*, comes to mind.

In the early 2000s online and offline trade settlements were conducted using the US dollar, the world's reserve currency, with online trade dependent on traditional financial settlement networks. Today however, there are different ways to settle online trade using units of account that are native to the internet. Since the invention of cryptocurrencies trade can be settled completely on-net—entirely on the internet—not via highly regulated off-net financial networks.

There are now over 19,000 cryptocurrencies. So far, these volatile and speculative units of account can be exchanged on over 500 digital exchanges. These exchanges enable conversion to other digital assets, such as non-fungible tokens—financial assets consisting of digital data stored in a blockchain—and stablecoin, less volatile units of account with prices linked to a commodity or fiat currency.

The internet's borderless culture of innovation has fostered the development of unregulated digital assets. This has prompted the Biden administration in the United States to issue an executive order promoting their responsible development and

the European Union to develop the Markets in Crypto-Assets regulation. And the US$83 billion collapse of the stablecoin TerraUSD serves as a stark reminder that rapid financial innovation may have unexpected consequences.

Nevertheless on-net financial innovations continue. The opportunity to invent new online economies and their units of account is too large to ignore. Indeed the venture capitalists that created today's internet, appear unfazed by TerraUSD's collapse and continue to raise decentralised finance crypto funds. In May 2022, for example, Andreessen Horowitz raised US$4.5 billion for Crypto Fund 4, bringing its total raised for investment in cryptocurrencies to US$7.6 billion.

Innovation and cross-border experiments are also occurring among off-net financial networks. Central banks have been leading the charge, responding to private innovation by introducing their own CBDCs—digital representations of existing central bank liabilities. CBDCs currently take two forms: wholesale liabilities between a central bank and commercial financial institutions, and retail liabilities between a central bank and its citizens.

As of May 2022, 90 per cent of central banks were exploring CBDCs. There are no less than 87 ongoing CBDC experiments led by central banks, with a digital euro expected in 2026, the United States considering the implications of a digital dollar and India announcing plans to move ahead with a digital rupee. Nine countries have launched digital currencies while 14 others—including China and South Korea—are making rapid progress with their pilot programs.

ALTHOUGH CBDCs are mainly envisaged for domestic use, experiments are underway to conduct cross-border payments via multi-CBDC arrangements. One example is the mBridge digital currency portal, a collaboration by the BIS Innovation Hub Hong Kong Centre with central

> If life follows art, it is not hard to imagine a splintered world and political economy akin to George Orwell's dystopia

PICTURE: REUTERS / FLORENCE LO

Staff attend a counter promoting China's digital yuan at the 2021 China International Fair for Trade in Services (Beijing, 2021).

banks in Hong Kong, Thailand, China and the United Arab Emirates.

Current discourse on network infrastructure is dominated by the question of whether CBDCs and their cross-border equivalents will dominate trade under regional trade frameworks, or if cryptocurrencies and hybrid CBDC–crypto approaches will emerge as the front runner for on-net trade. But politicising and polarising this issue could force global networks, like the Society for Worldwide Interbank Financial Telecommunication (SWIFT) or the internet, to split into incompatible networks, or splinternets.

The Ukraine–Russia conflict raises important questions around the political neutrality of on-net and off-net infrastructure for global trade settlement. SWIFT's ban on Russian banks and the use of cryptocurrencies to fund aid or subvert financial sanctions has fuelled debate about crypto's potential to challenge monetary sovereignty and the risks associated with currency substitution. To circumvent such risk, the Central Bank of Russia has already established the System for Transfer of Financial Messages. Similarly, the People's Bank of China has built its own Cross-Border Interbank Payment System.

It is increasingly likely that the politicisation of global trade will force East Asian business to choose between on-net units of account that risk state-led internet shutdowns, or off-net options that could lead to financial sanctions. But there is an opportunity for regional arrangements like RCEP to build politically neutral trade settlement mechanisms that avoid the use of any CBDC. Instead, given progress in current on-net innovation, it could design a politically neutral unit of account that could be used for on-net and off-net settlements. By integrating on-net and off-net financial settlement networks, there are ways to avoid creating splinternets and build a global and inclusive future for digital finance. EAFQ

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BACK TO THE FUTURE

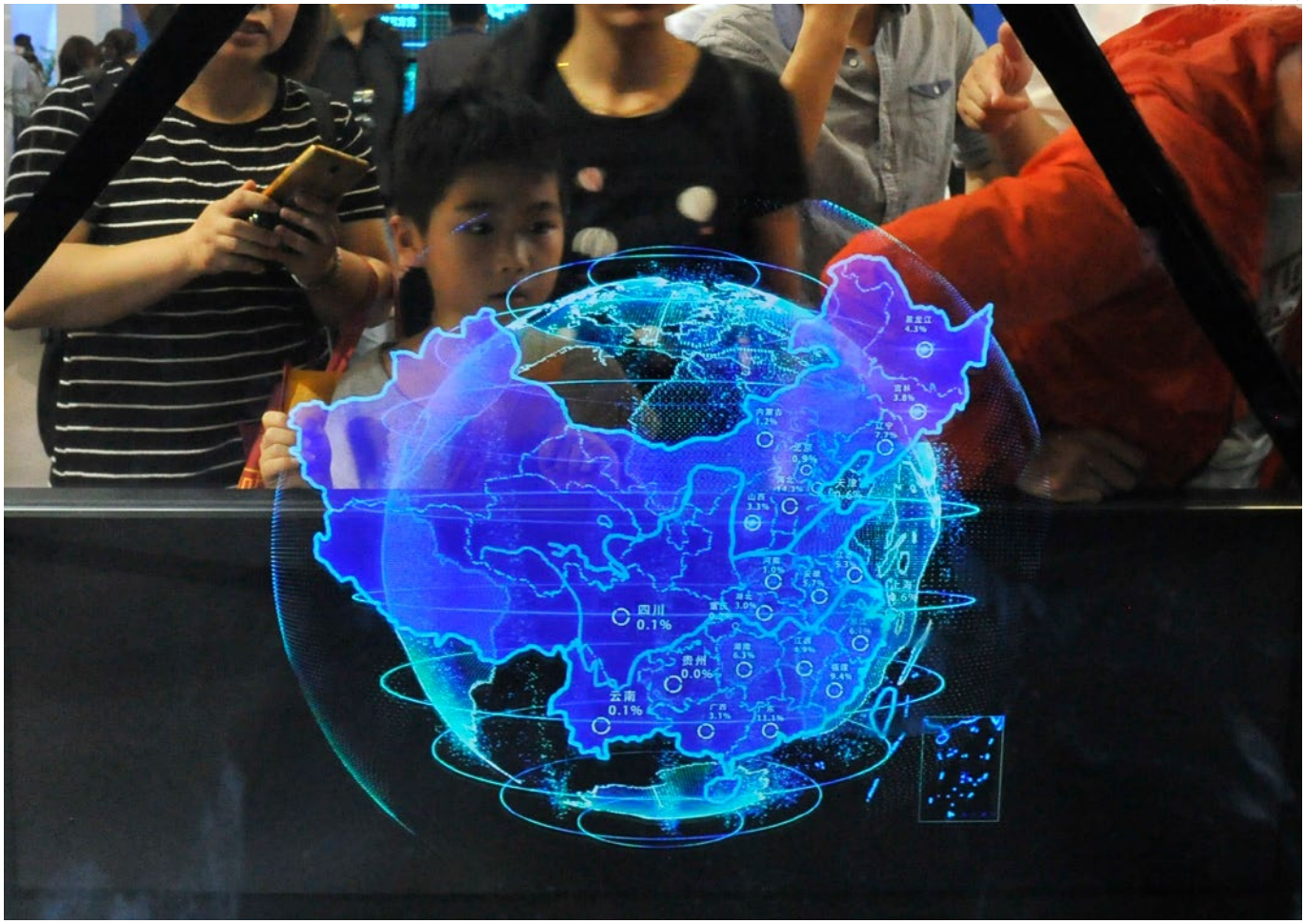
Asia and digital neo-mercantilism

MILTON MUELLER

IS THERE an Asian digital regime? There was, though it was closer to a global regime based on neoliberal principles of free trade and globally distributed supply chains in which Asia played a special part. But that order is disintegrating, as nations inside and outside Asia revert to a new form of neo-mercantilism focused on digital technologies. In this new model, national security seeks to displace trade and growth on the agenda.

In the 1980s and 1990s, a new ideological, political and economic movement started to transform the Western political economy. Policymakers tamed inflation, lowered taxes, curbed the expansion of the welfare state, privatised state-owned industries, introduced competition into regulated industries, reduced trade barriers and deregulated capital flows. The impact of this policy shift was magnified when China cast off Maoism and moved towards a domestic market economy in 1979. It accelerated even more when the Soviet Union collapsed in 1990 and newly independent Eastern European countries moved from central planning

PICTURE: REUTERS



Visitors inspect a big data demonstration by Sinochem during the first Digital China Summit in Fuzhou city (Fujian province, 2018).

to market economies.

Two of the most important industries that were liberalised in this phase of modern commercial development were telecommunications and information technology. From the 1980s on, many state-owned post, telephone and telegraph monopolies became privately owned firms in more competitive markets. Standardisation moved away from states and intergovernmental organisations to private non-profits like the Internet Engineering Task Force, 3rd Generation Partnership Project (3GPP) and other industry-led forums.

At the same time, plurilateral trade agreements—especially the WTO's 1996 Information Technology Agreement (ITA)—cleared a path for a globally distributed supply chain in information and communication technology (ICT) equipment. East Asian producers were the chief beneficiaries. Largely due to the performance of Asian economies, developing economies' share in world exports of ITA products jumped from 26 per cent in 1996 to 63 per cent in 2015, and seven of the top ten exporters of ITA products were Asian economies.

The internet and the world wide web tied together this emerging digital economy with open, non-proprietary standards. A transnational platform economy based on search, social media, e-commerce, video-sharing and apps began to emerge. It was led by US companies, but Chinese start-ups were fast followers. Fuelled by creative entrepreneurs and helped

Neoliberal globalisation is now being reversed all over the world

The globalised regime that East Asian countries benefited from so greatly is fragmenting into several large geopolitical blocs

along by capital and partnerships from the United States, China developed its own platform economy that dominated its sizeable national market and then developed regional and global aspirations.

Neoliberal globalisation is now being reversed all over the world. Both left-wing and right-wing critics are pushing for a more bordered economy. There are tariff wars reminiscent of the 1930s, attacks on immigration and calls for greater national autonomy. This shift is largely due to the sometimes spurious link between national security and trade in ICT goods and services.

In the past five years, the United States has tarnished all Chinese ICT firms as Trojan horses for the Chinese Communist Party (CCP). It has actively sought to cripple Huawei, cutting it off from advanced semiconductors on the grounds that the CCP will exploit any Huawei equipment in a domestic network. The United States has de-licensed four Chinese telecom firms for similar reasons and pulled the plug on several international cables due to some Chinese ownership.

A new law governing foreign investment passed in 2018 prevented China from investing in high-tech firms regardless of whether they produce military capabilities. The US Council on Foreign Relations published a pamphlet with an open call for weaponising digital trade.

THIS lack of trust is reciprocal and contagious. China has always been aggressive about leveraging market access for technology transfer efforts. But its most recent efforts to achieve self-sufficiency in US-dominated high-tech industries have spooked Washington.

China has intensified its blocking of foreign information services, doubled down on domestic censorship and eviscerated Hong Kong's autonomy to target free expression. Since 2020, Beijing has instituted sweeping regulations that restrict the outbound and inbound flow of business data. It is excluding foreign cloud service providers from its domestic market and imposing burdensome cybersecurity reviews on its own digital companies. China has discouraged its private firms from listing on US stock exchanges because the auditing process might reveal sensitive national data. China's crackdown on Alibaba's financial innovations seemed designed more to subordinate the firm and protect CCP control of finance than to avoid market failures.

India, with its nationalist Bharatiya Janata Party regime, aligns with this pattern. Its military spat with China led to the ban of dozens of Chinese apps. Despite benefiting from US firms' outsourcing in IT services, it is planning to create national champions in digital payments and other areas that can substitute for the services of US multinationals. India is also imposing more censorship and surveillance on internet users.

Japan and some ASEAN countries may still be interested in continuing the trend towards liberalisation and globalisation in the digital arena. Members of the Regional Comprehensive Economic Partnership (RCEP) are trying to facilitate some aspects of digital trade, and there are attempts to expand ITA and advance WTO efforts in digital services. But the mistrust and securitisation driven by the US–China split may overwhelm those efforts.

Neo-mercantilism calls attention to the way trade and investment in technology and national industrial policies are related to national security and the relative power of the state. In contemporary policy dialogues, trade policy, tech policy, foreign policy, military strategy, cybersecurity and industrial policy are distinct areas of expertise. But looking at the US–China conflict as the two nations competing for a dominant role in the global order analytically slots those pieces together. It is a *digital* neo-mercantilism because technologies such as 5G telecommunications, semiconductors, social media platforms and artificial intelligence capabilities are at the centre of the competition.

The globalised regime that East Asian countries benefited from so greatly is fragmenting into several large geopolitical blocs—the United States, Europe, China and India—resulting in a more bordered space governed by tensions and power plays. EAFQ

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Biden's United Front targets China's fight for silicon supremacy

DOUG FULLER

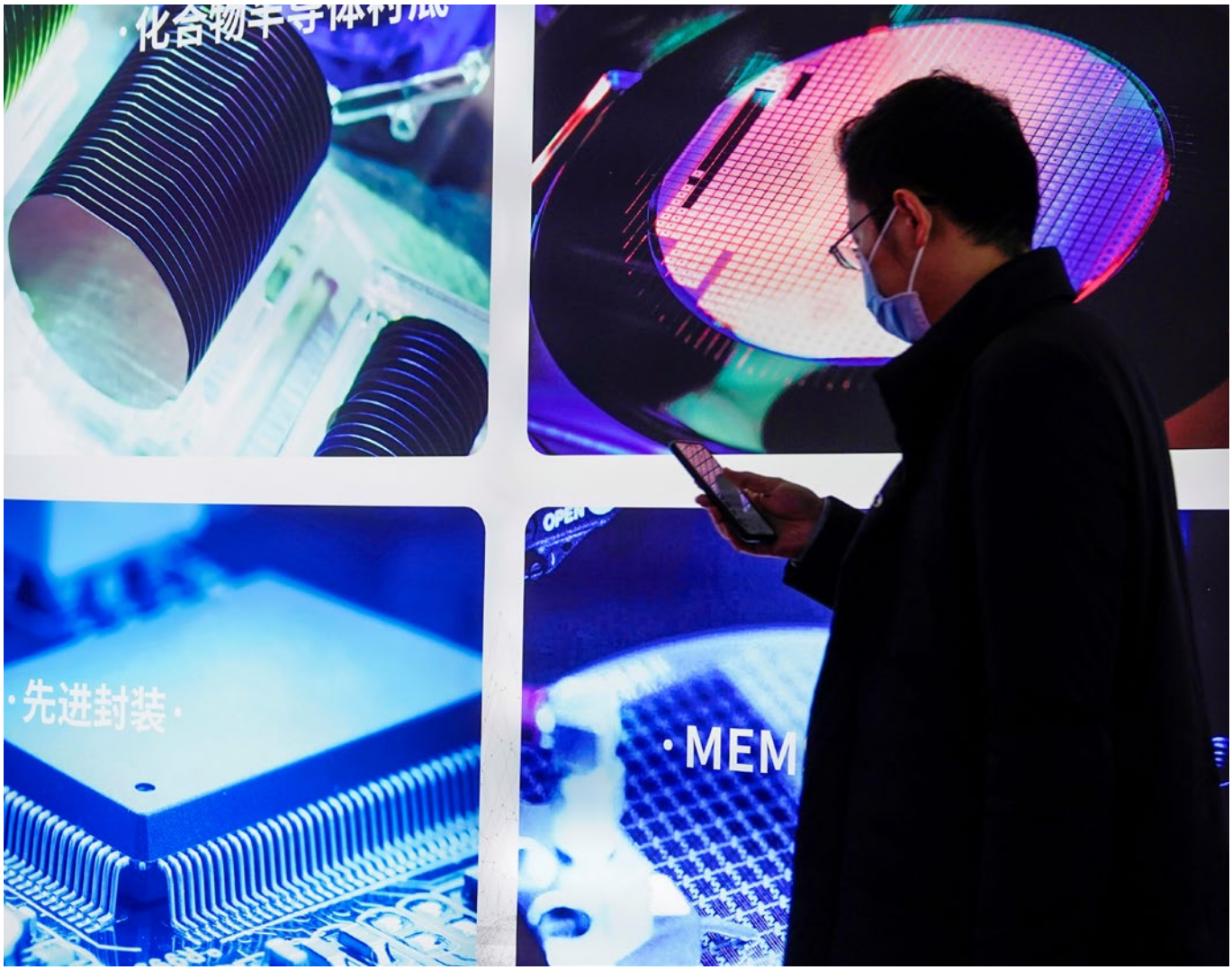
MORE than a year into the Biden administration, many are disappointed by its China tech policy. The China hawks are disappointed by the lack of any movement towards decoupling, while globalists are disappointed by the lack of reversal of many of Trump's trade and investment policies. Within the administration itself, there are representatives from each policy camp.

We typically bemoan bureaucratic infighting, but there are times when it should be celebrated, or at least the policy outcomes it brings about. The Biden administration has stumbled upon a subtle middle ground between decoupling and reversion to inadvertent abetting of China's rising technological dominance. Like all happy policy accidents, its survival is

PICTURE: REUTERS / JONATHAN ERNST

US President Joe Biden, Secretary of State Antony Blinken and Treasury Secretary Janet Yellen, meet virtually with Chinese President Xi Jinping (Washington 2021).

PICTURE: REUTERS / ALY SONG



A man visits a display of semiconductor devices at Semicon China, a trade fair for semiconductor technology (Shanghai, 2021).

Pushing broader controls will ultimately push Chinese and foreign businesses to develop an alternative semiconductor supply chain

in doubt as the consensus behind it is frighteningly fragile.

The genius of Biden's accidental policy is that it keeps business allies, including those hidden in China, on board for narrow and targeted sanctions against certain Chinese organisations, allowing the United States to achieve clearly defined policy goals. Keeping both these formal and informal allies acquiescent, if not happy, is critical to sustaining US technological advantage. By constraining the scope of sanctions and enhancing their predictability the Biden administration has created its own United Front with state and business actors, fostering support for US technology and acceptance of its own foreign policy.

As US technology controls targeting China evolved during the Trump administration, they focused on three areas: Huawei, human rights and China's military-industrial complex. These controls targeted China's ability to design and manufacture semiconductors. Without access to chips, Chinese firms were hobbled. The policy question for the Biden

administration was whether to broaden its controls beyond these three areas.

THE Biden administration has steered a moderate and generally predictable course of maintaining narrow controls that cut off firms from accessing American semiconductor technology in the form of chip-design software and chipmaking equipment, even if that equipment is outside of the United States. Firms that have found themselves subject to these controls have run afoul of the United States by supplying Huawei, China's military-industrial complex or a public security apparatus that impinges upon human rights. The United States Commerce Department, for example, is reportedly investigating the Chinese joint-venture partner of a key US chip design software provider, Synopsys, which allegedly allowed Huawei to gain access to US software.

Restricting the scope of controls has limited further fallout for key chipmaking equipment suppliers from Japan and the Netherlands. Japanese firms have taken advantage of US controls by making a pitch to Chinese customers that their products represent less regulatory risk than those of their American competitors. And while Netherlands-based ASML agreed not to deliver advanced extreme ultraviolet (EUV) lithography equipment to targeted Chinese firms, they are still carrying on a booming business in the previous generation of deep ultraviolet (DUV) machines.

The United States needs to keep its formal allies and friendly Chinese business foes on side because these two groups, alongside US semiconductor firms, are key players in determining whether China can reduce its dependence on US technology. In 2020, as US and foreign semiconductor capital equipment makers assessed the likelihood of export controls expanding beyond Huawei-related business, producers were already strategising work-arounds for potentially onerous controls. The CEO of KLA, the third largest producer of semiconductor capital equipment, suggested that the firm might seek to de-Americanise its products to put them beyond the long arm of US export controls. American producers went so far as to war-game how quickly an advanced fabrication plant could be built without American content. Using de-Americanised equipment alongside Dutch ASML equipment was deemed the quickest route with a timeframe of four to six years.

China itself has doubled down on investment in semiconductor capital equipment with the second tranche of its China Integrated Circuit Investment Industry Fund and 14th Five Year Plan. And yet, targeted firms such as Huawei have found themselves effectively cut off from semiconductor production in proscribed technologies while business booms for everyone else. The narrow scope of export controls has maintained an international coalition of businesses that effectively undermines China's attempts to create alternatives on its own. The world is still reliant on US technology for designing and manufacturing chips and Chinese firms still have a very healthy appetite for US equipment that belies pledges to support onshoring of its semiconductor supply chain.

But the international coalition is fragile. Proposed legislation from Congress to block wider swathes of Chinese industry from access to technology threatens to undermine it. As do similar proposals emanating from the National Security Council for tighter multilateral controls of semiconductor technology and a new semiconductor alliance with Japan, South Korea and Taiwan. These proposals have met with little enthusiasm and much passive resistance from South Korea and Japan.

> The genius of Biden's accidental policy is that it keeps business allies, including those hidden in China, on board for narrow and targeted sanctions against certain Chinese organisations

A short-term policy victory for the China hawks might prove pyrrhic. China currently has few allies and little hope in its fight for silicon supremacy. Even its own consumers and chip designers are reasonably content with reliance on international suppliers. Pushing broader controls will ultimately push Chinese and foreign businesses to develop an alternative semiconductor supply chain, to the benefit of China's quest to escape technological dependency on the United States. EAFQ

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Tackling the information disorder in Asia

HELANI GALPAYA AND
RAMATHI BANDARANAYAKE

HAVING stagnated for years, the percentage of South Asians who have used the internet has finally reached the 50 per cent mark. In the South Asian region internet use is synonymous with social media, with most users spending all their time on Facebook, WhatsApp or other chat applications. Many of these users have low digital skills. They are often passive consumers in a digital world that attempts to influence, and at times misinform and manipulate, them. Another smaller group are more active consumers, working digitally on global remote-work platforms and earning much-needed income. But even their labour can be an unwitting

PICTURE: THOMSON REUTERS FOUNDATION / RINA CHANDRAN

A young girl uses her mother's phone to attend school online from home (Maharashtra, 2022).

participant in these manipulation efforts.

Like other regions, South and Southeast Asia have seen a growing debate about 'information disorder', a term including misinformation, disinformation, mal-information and hate speech. This is not a new problem. False and hateful content has long been spread by governments, individuals, special interest groups and other entities through non-digital means. But digital technologies enable a higher volume of information to spread faster and with greater reach.

Information disorder can be spread by actors with different motivations. In the political arena, organised online disinformation campaigns such as 'IT cells' in India, 'troll factories' in the Philippines, 'buzzers' in Indonesia and 'cyber troops' in Malaysia seek to influence electoral and other political outcomes. These campaigns can also cross borders. A 2020 EU Disinfo Lab report described an operation they dubbed 'Indian chronicles', which 'resurrected dead media, dead think-tanks and NGOs' as part of an attempt to undermine Pakistan internationally.

Likewise, Doublethink Lab in Taiwan observed operations based in China and Taiwan pushing narratives such as 'democracy is a failure' targeting Taiwan's 2020 general elections. Hate speech against ethnic minorities also spreads online. Serious anti-Muslim sentiment online was documented in Myanmar as the conflict in Rakhine grew in 2017.

The COVID-19 pandemic has engendered the further spread of misinformation, including fake cures. In India, herbal remedies have been promoted, without evidence, as 'cures' for COVID-19. Certain ethnic and religious groups have been scapegoated as 'spreaders' of the virus, including Muslims in India.

There is also a worrying intersection of digital labour with the production of disinformation. Online job boards such as Fiverr are being used to recruit digital workers to take part in information manipulation campaigns. In Pakistan, actors and voice-over artists were hired to praise Pakistan, criticise India and commend the China–Pakistan Economic Corridor on Facebook. One freelancer who was hired via Fiverr stated she was unaware that her face had been used in propaganda. Similar phenomena have been studied in the Philippines, where digital influencers, participating in disinformation campaigns cite financial motivation to be part of the aspirational middle class as a cause of their participation.

CENSORIOUS political environments pose challenges, as fact checkers who point out government officials' factual errors are slandered. Governments also weaponise fact checking. In Pakistan, pro-government 'fact checkers' have maligned the reporting of journalists who criticise the government's 'fake news' and harass the journalists online. Governments have seized on the need to fight 'fake news' to pass new restrictive legislation. Two prominent examples are Singapore's Protection from Online Falsehoods and Manipulation Act 2019 and Malaysia's since-repealed Anti-Fake News Act of 2018.

But defamation laws, cybersecurity and tech laws, media laws, laws to deal with COVID-19 and even colonial-era sedition laws are also used to regulate speech. For example, Section 66D of Myanmar's 2013 Telecommunications Law states that 'extorting, coercing, restraining wrongfully, defaming, disturbing, causing undue influence or threatening any person using a telecommunications network' can be penalised by up to three years in prison. The law has been used to target those who criticise government figures.

> Information disorder undermines democratic processes, encourages violence against ethnic minorities and other vulnerable groups and obstructs responses to emergencies such as disease outbreaks

Section 21(1) of Bangladesh's Digital Security Act of 2018 says that 'if any person, by means of digital medium, makes or instigates to make any propaganda or campaign against the liberation war of Bangladesh, spirit of liberation war, father of the nation, national anthem or national flag, then such act of the person shall be an offence'. Critics of the government's COVID-19 response have found themselves detained under this law, with one dying in jail pending trial. These laws have been criticised for their vague definitions of offences, harsh penalties and politically motivated applications, which provide governments with easy means of silencing dissent.

INFORMATION disorder undermines democratic processes, encourages violence against ethnic minorities and other vulnerable groups and obstructs responses to emergencies such as disease outbreaks. But heavy-handed and bad faith responses from governments across Asia are not the solution. We cannot legislate our way out of the information disorder.

The question remains, then, what should be done about it.

Independent, third-party fact-checking is increasingly seen as a popular solution. Social media platforms such as Facebook work with country-specific fact-checking outfits to moderate content, helping the platform access local language content and contexts. Posts identified as possibly misleading or fake are downgraded by the platform algorithms to reduce the spread. Other research shows that posts that are fact checked lead to less sharing by users. But the sheer volume of content to be checked makes it difficult to keep up. Few fact checkers are able to do so at scale, due to lack of artificial intelligence and other tools that work in an Asian context and support Asian language data screening. The lack of credible sources against which to fact check also poses challenges. Complaints channels can also be weaponised to shut down the social media accounts of journalists and media organisations perceived to be critical of governments.

Teaching digital and media literacy—including through formal school and university curricula or community-based grassroots level programs—is another countermeasure. Similar measures undertaken in Nordic countries such as Finland, which teaches critical thinking on misinformation and digital literacy in schools, show promising results. Digital literacy initiatives in Asia are taking place at a smaller scale and are rarely implemented without formal and long-term education systems. This is important since evidence suggests countries with better quality education also have higher media freedom. Even for the digital literacy programs that are implemented, little is known about their impact. This is an important area for future research if everyone is to be a fact checker and be an active consumer of information.

Finding the right balance between freedom of expression, the growth of fake news and the right to privacy will be key to Asia's digital future. EAFQ

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PICTURE: KAZI SALAHUDDIN RAZU / NURPHOTO

Train passengers travel through dense clouds of smoke generated by a nearby steel re-rolling mill in Dhaka (2022).

State-owned enterprises and Asia's energy transition

CHRISTOPH NEDOPIL WANG

STATE-OWNED enterprises (SOEs) in Asia are in a unique position to take a leading role to shift economic activity from polluting to green. Yet so far, most SOEs have underutilised green financial instruments, such as green bonds, to support this transition. This leaves ample room for growth which could spur further investments in innovative and green technologies, support development of green capital markets and reduce the risks of climate change.

Given Asian countries' commitment to accelerate their energy transition to meet ambitious carbon reduction targets, SOEs—including their regulators and owners—urgently need to transform their business operations. SOEs have a monopoly in energy generation and transmission in many Asian countries, and account for about 60 per cent of infrastructure investments and up to 70 per cent of

Besides moving electricity generation from fossil fuels to green energy, massive investments are needed in the transport sector … and in the agriculture sector

fossil fuel-related and energy transition investments.

With these assets in incumbent sectors, SOEs globally 'are responsible for at least 7.49 gigatons of carbon dioxide equivalent annually in direct (Scope 1) emissions … with the true scale of SOE-related emissions likely to be substantially higher', according to a Preliminary Inventory published by the Centre on Global Energy Policy (2022). This is equivalent to at least 15 per cent of direct global greenhouse emissions. In addition to these Scope 1 emissions—direct emissions from the combustion of fossil fuels—SOEs also play an important role in the extraction of fossil fuels, while state-owned financial institutions hold significant assets in high-emitting sectors.

Shifting SOEs from brown to green energy will require investing billions. Money is needed to increase overall electricity production and to shift existing assets by retiring coal-fired power plants early—all while ensuring public service provision and providing much needed employment. In 2017 the Asian Development Bank reported that developing Asia alone would require an estimated US$26 trillion just in infrastructure finance during 2016–2030 'to maintain its growth

PICTURE: REUTERS

Chinese workers install panels at the Huainan solar farm in Anhui province. Constructed on the site of a former coal mine and comprising over 160,000 solar modules, the array is one of the world's largest floating photovoltaic solar plants and has capacity to power more than 15,000 homes (2017).

momentum, tackle poverty, and respond to climate change', particularly in sectors that are driving climate emissions.

Besides moving electricity generation from fossil fuels to green energy, massive investments are needed in the transport sector to support green and public transport, and in the agriculture sector to switch from land-intense practices to more efficient options and plant-based food supplies.

With government financing strained—not least due to global sovereign debt issues in the wake of the COVID-19 pandemic—SOEs must evaluate how to quickly raise the required funds from different sources, including local and global capital markets. Luckily, SOEs have a sustainable finance toolbox at their disposal.

One such financial instrument that has gained much attention are green bonds. The use of green bonds is flourishing due to widespread development of green bond standards and green bond markets. In much of Asia, the ASEAN green bond standards have become the norm, while countries like China have developed their green bond catalogue of 2016 (renewed in 2020) and Indonesia has issued its Green Finance Taxonomy earlier in 2022. This has allowed the green bond market in developing Asian countries to grow to US$94.2 billion of issuances in 2021.

Despite their central role for the green transition, SOEs in developing Asian countries play only a minor role in the green bond markets with one exception. China's SOEs have issued about US$217 billion in green bonds between 2015 and March 2022. This is equal to about 42 per cent of China's total green bond market compared to 18 per cent for developing Asian countries. For Asian SOEs, this leaves much room for growth in green bond issuances.

THE further utilisation of green bonds by Asian SOEs would come with four direct benefits. First, unlike public debt, commercial or non-sovereign borrowing does not expand already overstretched public coffers.

Second, accessing capital markets can drive SOE efficiency as it requires financial sustainability and acceptable levels of transparency. Some governments may also welcome the resulting capital market supervision to improve the corporate governance of their SOEs.

Third, SOEs' green investments will lead to more demand for green technologies, such as new energy networks, which in turn support private businesses. This leads to new employment, often in higher value-adding sectors.

And finally, the issuance of SOE green bonds can also accelerate local green bond market development. By utilising local capital markets to raise funds, SOE financing can attract more international investors, who often lament lacking project pipelines and high-risk investment in emerging markets. SOEs can provide both more projects and lower risk projects. SOE green bond issuances would further support capacity building for local investors and verifiers and could spur further investments in the private sector.

To make SOEs more bankable and accelerate the utilisation of green bonds, SOEs need to develop proper governance systems vis-a-vis their government owners that allow them to raise funds from capital markets. They must also establish a credible green strategy and capacity to attract investors along with relevant monitoring, reporting and verification capacity to provide information on procedures, or the impact of the sustainable-linked instrument, to investors.

The use of green bonds is flourishing due to widespread development of green bond standards and green bond markets

While green bonds are not without risks, and SOEs need to build relevant capacity to issue them, their expansive use has the potential to accelerate the much-needed green transition of Asian economies. EAFQ

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Top priority for Indonesian leadership of G20 cooperation

Ears of wheat grow in a field near the Ukrainian village of Zhovtneve.

PICTURE: REUTERS/VALENTYN OGIRENKO

C. PETER TIMMER

IN JUST over three months, the world food situation has gone from bad to worse. Calls to not panic fell on deaf ears, even as the Ukrainian military put up stiff opposition to the Russian onslaught. If Ukraine somehow wins the war, it will be decades before its economy and agricultural exports return to their previous levels.

Many countries in Asia and around the world have panicked in the face of global shortages. China banned the export of agricultural chemicals, Indonesia banned the export of palm oil and India banned the export of wheat. Malaysia has banned exports of chicken. The United States has expanded its commitment to maize-based ethanol, raising the mandated amount in gasoline supplies in order to lower the cost of driving. That maize could have been diverted to human consumption, to help substitute for wheat shortages.

Although many long-term, structural and policy problems have contributed to this crisis, the urgent need at the moment is to focus on improving the short-term situation. The longer-term consequences are possibly more troubling, but they are much harder to analyse with the outcome of the war unresolved. Historically, structural transformation in developing economies leads agriculture to decline in relative importance as the modern industrial and service sectors, mainly in urban areas, grow much faster. It has been the only sustainable pathway out of poverty. Any forces that slow this process, or even bring it to a halt, also slow or halt the reduction of poverty and hunger. These forces can

be internal, such as hostile political environments, or external shocks, such as wars and food crises.

The sharply higher rural–urban terms of trade brought about by food crises significantly slow structural transformation. More agricultural workers remain on the farm, with fewer moving to more productive jobs off the farm or in urban areas. Rural poverty increases because the poorest rural households usually buy most of their food. Agricultural productivity stagnates, and the country remains mired in poverty. Much of sub-Saharan Africa is caught in this trap, and a number of countries in the Asia Pacific remain vulnerable if the food crisis drags on. Papua New Guinea and most Pacific Island countries are at high risk.

Just as with the rice crisis in 2008, some outside intervention will be necessary to break the cycle of panic and 'beggar thy neighbour' trade policies. The rice crisis in 2007–08 was *caused* by panicked importers, exporters, and hoarding by small-scale participants along the rice supply chain, from farmers to shopkeepers to consumers. Prices spiked, fuelling the panicked buying. Once the *reality* of adequate supplies was made apparent after Japan announced on 2 June 2008 that 1.5 million tons of US long grain rice would be available for re-export from Japanese storage silos, rice prices fell very quickly. The world rice market stabilised in a matter of weeks, and it has remained fairly stable ever since. Trust in the world rice market has been re-established, at least among most Asian participants. ASEAN has played a surprising role in establishing and maintaining this trust. The leaders meet twice a year and food security is on their agenda every time.

Building such trust in the current, more complex, environment will be harder. The complexity comes because the current crisis is more diffuse—it involves fuels, fertilisers and foods, especially wheat and vegetable oils. At the same time, the crisis is now more acute. All of these commodities are experiencing low inventories, curtailed production and disrupted supply chains. It will not be easy to stop this crisis, much less return to more normal trade patterns. Coordination among the world's leading economies will be needed to make progress.

FORTUNATELY, an opportunity for such coordination is on the horizon. The forthcoming G20 summit meeting is being hosted by Indonesia in Bali in November 2022. With Indonesia in the chair, there is an opportunity for that country and for ASEAN, as a major regional trade organisation, to get a formal commitment from G20 members to focus on food security and roll back trade restrictions.

It is fitting that Indonesia played a stabilising role in the 2007–08 rice crisis. The trade minister at the time, Dr. Mari Pangestu, announced a ban on rice exports from Indonesia. She was mocked by regional rice traders at the time because Indonesia is a regular rice importer. But the announcement served its purpose. There was no panic over rice price increases in Indonesia—unlike in Vietnam and the Philippines—as the country's rice supplies served to reassure domestic consumers that soaring world prices would not affect Indonesia.

As a first step, full and detailed accounting of current grain supplies by major exporters would help prevent a repeat of the 2007–08 price panic. A pledge from these exporters to allocate supplies to customers most in need would reduce importers' fears, build trust and stabilise the world grain economy.

Russia's possible participation in the G20 will complicate this agenda. Still, there is room for active diplomacy, ideally led by Indonesia, to circumvent this problem. If that is possible, the elements of a 'G20 Bali Commitment on Trade Normalisation' are fairly straightforward.

It will require a firm pledge to avoid any further export restrictions on critical commodities, especially wheat, vegetable oils and fertilisers. Leaders will also have to agree to reduce, and eventually eliminate, export restrictions on these critical commodities. Individual countries can be given considerable leeway to time their actions in accordance with their local political circumstances.

To ensure commitment, it is important to establish a small secretariat, with Indonesia in the chair, to monitor and publish the details of implementing the commitments. Transparency is the best enforcement mechanism. Sadly, neither the United Nations nor the World Trade Organization can play a credible role here. But other organisations, such as

> ...lives are at stake if the global food supply chain continues to malfunction and if policymakers respond by restricting food exports in the face of severe shortages

the Agricultural Market Information System and the International Food Policy Research Institute could help fill the gap.

Several 'good faith' actions can be taken by the United States and European Union to set the stage for broader agreement at the G20 meeting itself. The European Union has already made a good start by mobilising to coordinate wheat exports to countries most in need. The United States should follow suit by reversing its boost to ethanol production and announcing guidance on how maize supplies can be redirected to human consumption. Efforts to conserve wheat consumption in favour of other carbohydrates, especially maize and potatoes, should be promoted.

It seems unlikely that China will be an enthusiastic participant in either early 'good faith' efforts or in joining the G20 commitment itself. Again, diplomatic efforts need to be brought to bear to avoid forcing China into a box and to encourage its engagement with this proposed Indonesian and ASEAN-led initiative. Although neither the United States nor Australia is likely to be able to play constructive roles in this diplomacy, the European Union could be quite influential.

Now is not the time for timid actions. Millions of lives are at stake if the global food supply chain continues to malfunction and if policymakers respond by restricting food exports in the face of severe shortages. It is understandable that individual countries are safeguarding their local populations with food produced on their own soil, but such actions exacerbate the rise in international food prices.

The foundation of food security is a *global public commons*: the world food economy. Most of the transactions with this world food economy are private exports and imports. But they depend fundamentally on reliable access to that global commons. Traders, private and public, need to trust the existence of this commons, because without it, the risks of depending on external food supplies for domestic food security are simply too high. 'Beggar thy neighbour' actions beggar *everyone*, because in a global public commons, we are all neighbours. Future prosperity depends crucially on reliable international trade and all countries need to accept their role in supporting it. A further retreat into autarky would be disastrous for world food security, now and in the future. EAFQ

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PICTURE: REUTERS/WILLY KURNIAWAN TPX IMAGES OF THE DAY

Trucks laden with bunches of fruit queue at an Indonesian palm oil factory in Siak regency (Riau province, 2022).

Digital provisions play a key role in Asia Pacific agreements

HENRY GAO

IT HAS become more commonplace for trade agreements in the Asia Pacific to include a variety of digital trade provisions. To understand the salient features of these agreements, it is helpful to map out their main baseline features. Doing so also indicates where digital trade agreements may be going or need to go. This mapping covers all free trade agreements (FTAs) with chapters on e-commerce or digital trade since 2000 by the main players in the region—China, South Korea, Japan, India, Australia, New Zealand, Singapore, Vietnam and Malaysia.

> ...it is unrealistic to assume that the mere inclusion of these provisions will boost trade... this needs to be coupled with the build-up of digital trade infrastructure and a regulatory environment

It also covers the mega-FTAs in the region—the Regional Comprehensive Economic Partnership, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the United States–Mexico–Canada Agreement, and the EU–Canada Comprehensive Economic and Trade Agreement (CETA)—as well as two standalone digital trade agreements, the Digital Economy Partnership Agreement (DEPA), bringing together Singapore, New Zealand and Chile and the Singapore–Australia Digital Economy Agreement (SADEA). Using the CPTPP as the baseline, digital trade provisions in these trade agreements can be grouped into four categories.

First, there are six provisions that are designed to facilitate digital trade including the elimination of customs duties on electronic transmissions, non-discriminatory treatment of digital products, domestic electronic transaction frameworks, electronic authentication, electronic signatures and paperless trading provisions. These provisions are intended to open and align the regulatory environment to enable digital trade to function.

Second, there are five provisions that minimise commercial and regulatory burdens for digital services trade providers. These include access to and use of the internet for electronic commerce, free flow of data, prohibition of data localisation requirements, prohibition on forced transfer of source codes and open government data. By removing these obstacles, digital services will be able to flow more freely across countries.

Third, three provisions protect the interests of consumers, including online consumer protection, privacy and personal information protection and protection against unsolicited commercial electronic messages. By addressing the main concerns of consumers, these provisions enhance the trust of consumers in digital services trade and boost the take-up rate of digital services.

The last category includes four provisions that preserve the regulatory autonomy of governments, such as those on cybersecurity, exceptions and cooperation. These help governments to reserve the space necessary to address various social policy objectives and ensure national security and safety requirements.

The first type of provisions is the most popular with more than three-quarters of FTAs including at least two from this category. They are intended to lay down the infrastructure or regulatory alignments necessary to facilitate digital trade and do not prescribe a specific regulatory approach on sensitive issues. As such, they face the least resistance from governments.

PICTURE: REUTERS / KHAM

East Asian leaders meet virtually for the 4th Regional Comprehensive Economic Partnership Summit as part of the 37th ASEAN Summit in Hanoi, (2020).

At the same time, despite these provisions helping developing countries to foster their digital services trade, implementation problems are likely. Implementing these provisions may require additional investment into hardware and software, a challenge for some developing countries. Having sufficient facilities could also be an issue. Instead, the statutory requirements on documentary formalities may need to be modified to consider new ways of contracting and approval.

The second type of provisions facilitate digital services trade by removing or attempting to minimise regulatory barriers that block or impede digital trade flow. As with earlier generations of trade agreements, it is often perceived that the primary beneficiaries of such measures will tend to be overseas services suppliers coming from the larger more developed economies.

Many developing countries are thus reluctant to agree to these provisions. The issue is not just economic as it once again involves a lack of capacity that regulators must grapple with.

But without these policies in place, foreign digital platforms will be hesitant to enter the local market, due to compliance costs, regulatory ambiguity and—in some cases—increased cybersecurity risks. Developing countries will therefore need to understand the benefits as well as the challenges arising from these provisions, at least as a welcoming signal to foreign digital firms.

The third type of provisions do not directly contribute to the development of digital services trade. They make indirect contributions to digital trade by fostering a trustworthy environment that eases concern among consumers. But developing countries often lack the domestic laws and regulations that would enable them to deal with many of the issues in this category.

The fourth type of provisions boost the power of governments vis-a-vis digital firms and so do not appear to be facilitative in nature. Yet, such provisions provide governments the manoeuvring space necessary to keep digital services in check. This is crucial for many developing countries as the bulk of digital services trade is provided by foreign suppliers. This also explains the popularity of these provisions, with more than 70 per cent of the surveyed FTAs including at least one provision in this category.

To foster the development of this sector, developing countries in Asia will need to enhance the provisions in the second and third categories. Given the complexity of digital trade, it is unrealistic to assume that the mere inclusion of these provisions will boost trade. Instead, this needs to be coupled with the build-up of digital

trade infrastructure and a regulatory environment that strikes a balance between risk control and market liberalisation.

It is partially in response to these challenges that the more recent standalone SADEA and DEPA agreements have emerged. The former introduces innovative memorandum of understanding applications as an appendix chapter to directly bring private sector proof points into the agreement, while the latter focuses almost exclusively on digital trade facilitation with a series of modular frameworks that are intended to be recrafted as digital trade channels flourish.

While both agreements challenge whether the existing multilateral trade agreement structure and process is fit-for-purpose in the emerging digital trade era, they also retain the overall traditional structure bridge to existing frameworks and processes. Both agreements also introduce a far more interesting focus on soft initiatives such as the use of regulatory sandboxes, digital identities and the enablement of artificial intelligence. As such, they raise interesting, if confronting, questions about both the viability and direction of the multilateral trade agreement process going forward. EAFQ

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This research is supported by the National Research Foundation (NRF), Singapore under its Emerging Areas Research Projects (EARP) Funding Initiative. Any opinions, findings and conclusions or recommendations expressed are those of the author and do not reflect the views of NRF.

Addressing the digital divide in ASEAN

GIULIA AJMONE MARSAN

THE economic dynamism of ASEAN is well-known and in recent years the region has seen the emergence of some of the fastest growing digital economies in the world. The COVID-19 pandemic accelerated this trend, with 60 million new digital consumers since the pandemic started and the internet economy on track to account for US$360 billion by 2025.

The acceleration of the digital economy coupled with needs spurred by COVID-19 restrictions have catalysed digital-enabled innovation and entrepreneurship in the region. This is reflected in several indicators. According to Bloomberg, Southeast Asian tech start-ups raised approximately US$8.2 billion in 2020, outperforming most other emerging markets, though this has slowed in 2022 in line with global trends. In 2021, there were more than 30 ASEAN unicorns—start-ups with a value of US$1 billion or more—and that number is growing fast.

Thanks to this dynamism, investors are looking beyond traditional start-up destinations such as Singapore—a long-standing global innovation hotspot—and Indonesia—a destination favoured because of its large market size—to reach countries such as Malaysia and Vietnam. At the same time, a growing tech-savvy cohort of millennial and Gen Z consumers is becoming an essential driver of this digital acceleration, creating a positive outlook for innovation in the digital economy.

Pandemic-induced challenges have accelerated innovation in specific sectors. Agritech, healthtech and edtech—innovation sectors generated by combining digital technologies with agriculture and food, healthcare, and education—have witnessed significant developments. In Singapore new policy initiatives, research and development (R&D) investments and regulations to help boost lab-grown meat production and urban, sustainable agriculture have allowed the city-state to attract leading start-ups in this area.

In other ASEAN countries, mobile applications which provide connections to medical providers flourished during lockdowns. One of a growing number of healthcare network platforms in the region, the Indonesian company Halodoc connected patients across the archipelago to doctors and provided home delivery of medicine while the country experienced the

PICTURE: REUTERS / DARREN WHITESIDE

Students at a government-run vocational training center study basic computer skills in South Jakarta (2017).

peak of the COVID-19 pandemic.

Educational technology became a necessity with COVID-19 school closures and the sector has grown considerably since 2020. Yet examples of regional edtech start-ups predate the pandemic such as the largest Southeast Asian online portal for higher education, EasyUni, which was established in Kuala Lumpur in 2008 to connect students to international study opportunities.

If the region wants to capitalise and build on these positive developments to accelerate the transition towards middle- and high-income, several issues need to be dealt with.

Highly skilled entrepreneurs are key to the emergence and consolidation of innovation hotspots. ASEAN must continue to expand its investments in skills development, with a particular focus on rural and peripheral areas where skills are most lacking. Enrolment in higher education in the ASEAN region is on average considerably lower than in parts of East Asia.

The region needs to raise the quality of universities and higher education institutions, which—aside from those in Singapore—are not yet on par with other countries in the Asia Pacific. It is not surprising that many of the successful digital entrepreneurs operating in ASEAN are returnees with overseas degrees. Further liberalising the higher education sector to provide quality education by facilitating exchanges with leading foreign universities and connections to global education networks is a necessity to provide a platform for tech-entrepreneurs. Indonesia opened its first foreign-owned campus last year.

At the same time, ASEAN policymakers should reflect on ways to make the circulation of talent easier at the regional level. This can be done by simplifying intra-ASEAN mobility and attracting more digital innovators to the region. Singapore has pioneered this idea with the recently launched Tech.Pass and other ASEAN countries could follow. Abundant regional amenities are an asset the region can capitalise on to attract mobile digital talent.

Addressing inclusion is critical for driving digital innovation. The benefits of ASEAN's digital economy are highly concentrated in some sectors. On average, ASEAN metropolitan areas have benefited disproportionately in terms of digital start-up creation. Some countries do not have adequate digital infrastructure in remote regions, where becoming a digital

entrepreneur is challenging.

Men and larger firms have also gained disproportionately through digital innovation. Women lag behind in terms of entrepreneurship opportunities, STEM skills and access to leadership and ASEAN micro, small and medium-sized enterprises invest and adopt digital technology at a much lower rate than larger conglomerates. The development of regional initiatives, such as Go Digital ASEAN which broadens digital skills participation in 10 countries, are aimed at reducing this divide.

Finally, while indicators and measures that monitor ASEAN's digital economy are not always discussed in analytical commentary, they are crucial to understanding developments in the region. The growing digital divides call for better understanding and mapping the emergence of digital innovation hotspots in ASEAN.

Some of the indicators traditionally used to capture these innovations in developed economies, such as patents and R&D investments, might not be fit for this purpose in developing economies. Firms in the region have a low propensity to patent, invest in or report investments in R&D and there is a large informal economy. Researchers and policymakers must think creatively and use the abundance of data available to monitor trends and developments. This will create a better understanding of the region and introduction of the measures needed most to develop broad-based digital capability in the future. EAFQ

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Investing in the skills to accelerate equitable digital development

CHENG WEI SWEE

ASIA'S digital economy has grown significantly in recent years, driven by factors such as national digitalisation efforts and COVID-19-induced changes in the use of digital platforms. The Malaysia Digital Economy Blueprint, for instance, aims to transform the country into a technology-driven nation by building digital infrastructure and driving digital transformation in the public sector. To maximise growth, policymakers must establish a robust understanding of the economic benefits of digital transformation, what drives the gains, the potential challenges to growth and how they might be overcome.

Presently there are several knowledge gaps. First, various definitions of the digital economy exist, and some are relatively narrow with potential to underestimate the impacts of digital transformation. For example, some studies focus only on platform-enabled activities such as super apps. Second, differences in evaluation methodologies make regional analysis difficult. Third, there is limited research on the economic benefits of technologies applied to traditional sectors. Neglecting the impact of digital technology on traditional sectors, such as health, overlooks its transformative effects beyond the technology sector. It is important to bridge these gaps in order to reveal the opportunities, risks and solutions.

Leveraging digital technologies offers many opportunities. Eight key technologies—mobile internet, financial technology, advanced robotics, additive manufacturing, cloud computing, big data, artificial intelligence and the internet-of-things (IoT)—and their related technology applications have transformative potential. Digital e-commerce platforms, facilitated by mobile internet, for example, can unlock productivity gains of up to 15 per cent through reduced labour requirements, inventory efficiencies and lower real estate costs. Digital technologies, it's estimated, have the potential to create an annual economic value of US$628 billion in Japan, US$80 billion in Thailand and US$60 billion in Pakistan by 2030. This is equivalent to about 13, 16 and 19 per cent of the countries' current gross domestic product respectively.

Traditional sectors such as retail

and hospitality, health, agriculture and food account for most of these benefits. Countries are already realising that pursuing digital transformation is imperative to manage challenges induced by the pandemic and to 'build back better'. Big data can help those tackling challenges in healthcare, social protection and education by supporting vaccine roll-outs, targeting vulnerable populations for social welfare and identifying specific skills gaps. Other technologies can address sustainability challenges such as biodiversity loss.

But there are significant barriers to realising the opportunities. Vietnam faces regulatory obstacles such as data localisation laws and limited digital connectivity. In Singapore, while most businesses have internet access and online presences, adoption rates for advanced technologies such as the internet-of-things (IoT) are low, especially for smaller enterprises. A key regional barrier is the digital skills gap. Two in three Asian workers are not confident that they are gaining digital skills fast enough to meet future career needs and 93 per cent of workers and organisations face obstacles—such as limited awareness of training options and the lack of time—to digital skills training. As new roles emerge and skill requirements evolve rapidly, employees will need regular training to keep up with job demands. Furthermore, there will be implications for labour mobility if technologies create job losses, especially if there are insufficient reskilling programmes to ensure that displaced workers can transition to other jobs.

While there is tremendous potential for digital transformation, the pandemic has also underscored the existing digital divide between countries. As high-income countries accelerated digital adoption, many low-income countries were left behind because they lack the necessary enablers such as reliable and affordable internet access. They will not be able to access the benefits of technology as systems are increasingly dependent on internet connectivity. This will drive the inequitable distribution of gains from the digital economy and continue to disadvantage low-income countries.

PICTURE: ADRIANA ADIE / NURPHOTO

A farmer uses an agricultural technology app while watering his crop in Bogor (Java, 2022).

Progress has been made to address these issues but greater partnership among stakeholders is critical to capture digital economy benefits. It is encouraging that governments in Asia have identified the digital economy as a key growth area. Examples include Singapore's Research, Innovation and Enterprise 2025 Plan, Vietnam's National E-commerce Development Program 2014–2020 and South Korea's Digital New Deal. Such initiatives are making significant progress and the Global Innovation Index indicates that while North America and Europe continue to lead globally, Southeast Asia, East Asia and Oceania are the only regions closing the innovation gap.

The pandemic has also accelerated efforts to enhance access to mobile devices and the internet, narrowing the digital divide. But there is scope to push further on policy enablers and greater partnership among stakeholders. Take digital skilling—many of the best initiatives require the support of stakeholders, such as governments, employers, workers and

training institutions. For example, to upskill talents, the Indonesian government could partner with industry leaders to develop skill frameworks that align with industry preferences for specific digital skills required in each sector. These frameworks could then be used to guide training efforts.

Addressing the limited awareness of training options, governments can develop skills portals to promote relevant courses and drive outreach to the masses, including displaced workers. Addressing the lack of time, training providers can work with industry to develop short-term micro-skills training courses. With this support, employers can leverage free training courses to upskill their workers. Finally, workers will need a mindset shift towards lifelong learning and must realise that upskilling does not always require formal degrees but can be undertaken through micro-skills courses.

The pandemic has amplified the importance of digital transformation in Asia in boosting long-term economic performance and resilience. Key stakeholders—such as governments and businesses—need to understand the economic impacts of digital transformation across sectors, identify existing gaps and risks and collaborate on steps to reap its full potential benefits. If the digital opportunity is captured, it presents a multibillion-dollar way forward for Asia's economy, a much-needed boost in the post-pandemic era. EAFQ

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ACCELERATING DIGITAL TRANSFORMATION

Asia's post-pandemic recovery prospects

LURONG CHEN

DIGITALISATION—the use of digital technologies and digital-enabled solutions in socio-economic activities—has triggered global changes that are wider and less predictable than ever before. With digitalisation, the world economy in the 21st century is set to become better connected, smarter and more efficient. Accelerating digital transformation is key to unleashing Asia's potential in global competitiveness and long-term development and is a core component of the region's policy package for post-pandemic recovery.

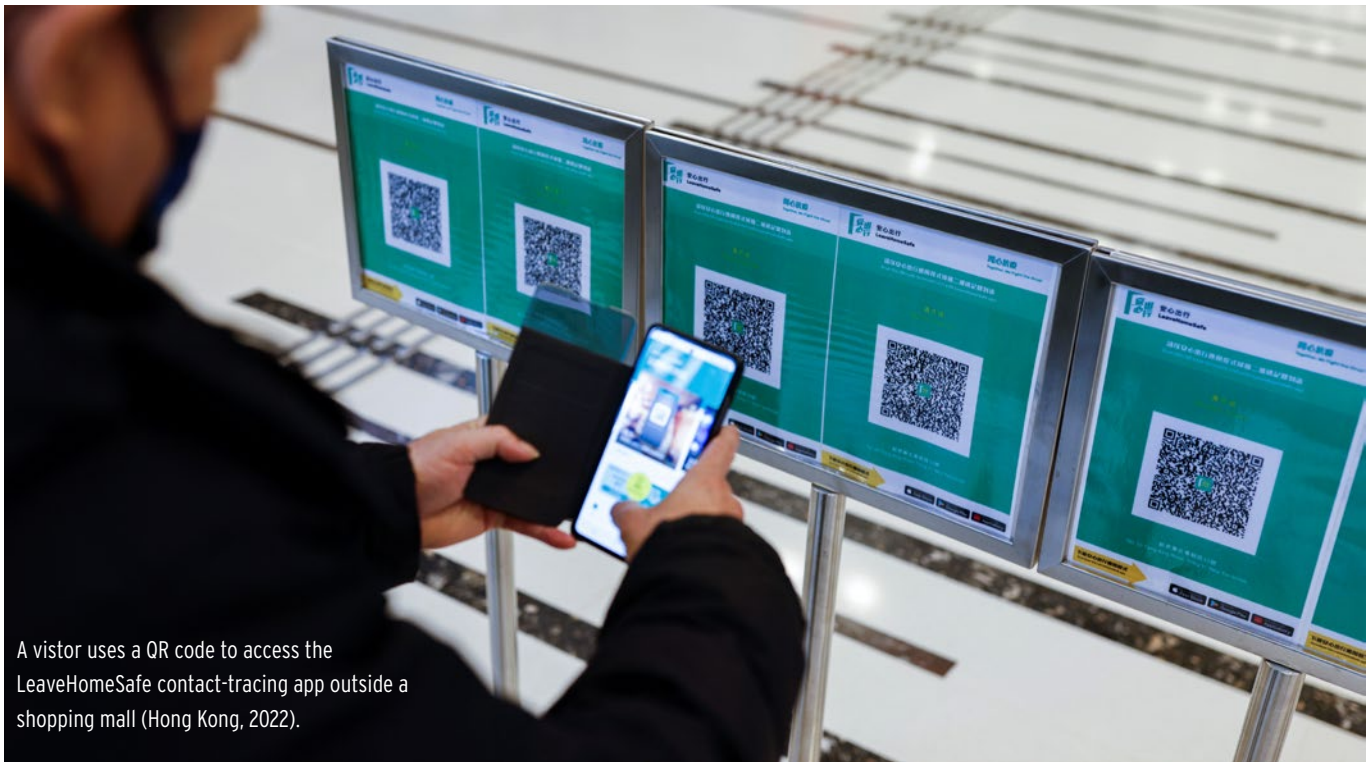
Despite ongoing recessionary drag from the pandemic, digital solutions provide an effective alternative for services and business activities in the face of government measures to limit mobility and empower people and businesses to grasp new market opportunities. Within two years, more than 600 million e-commerce users entered the online market, driving the world's total e-commerce revenue up by nearly 25 per cent from 2019 to 2020 and 17 per cent from 2020 to 2021.

Markets for online services—particularly education and food delivery—expanded quickly, thanks to higher than expected growth of digital platforms. The size of the market has increased by nearly 50 per cent since the beginning of the COVID-19 pandemic and the world's total revenue from these services reached US$466 million by the end of 2021.

There is also evidence that COVID-19 has accelerated the transformation towards a cashless society. Among ASEAN's population of 680 million, half now use digital payments to pay for products and services.

The internet has become an integral part of daily life. Especially during the pandemic, online solutions have efficiently substituted offline practices in many areas—from doing business online to working and studying from home. This has changed people's mindsets on digitalisation.

PHOTO: REUTERS / TYRONE SIU



A vistor uses a QR code to access the LeaveHomeSafe contact-tracing app outside a shopping mall (Hong Kong, 2022).

But many consumers and producers experienced hardship during the pandemic, not only from health threats caused by the virus, but also because of the global contagion of plummeting international commerce and the global economic recession.

The outbreak of COVID-19 and consequent lockdown measures triggered a global supply chain crisis. It started with a negative supply-side shock when China, the world's centre of manufacturing, closed its borders to prevent spread of the virus. As exports from China decreased sharply, total supply faced widespread shortages. Through the links of global value chains (GVCs), shocks spread quickly from the supply side to the demand side. Consequently, businesses in the upstream of value chains saw demand vanish, as orders from their downstream clients in China were suddenly cancelled or postponed.

Accelerating digital adoption will be necessary for post-pandemic economic recovery, particularly the recovery of GVCs. Indeed, the progress of digitalisation and GVC recovery will mutually reinforce each other.

ON ONE hand, digitalisation will make supply chains 'smarter'—introducing digital solutions into GVCs can strengthen connectivity, improve network transparency and reduce the risk of introducing shocks to the system. On the other hand, digitalisation needs GVCs to facilitate the production of hardware and software that are necessary for its development. An example is the semiconductor industry, production in which is dispersed globally to take advantage of high-tech capacities in the United States and low labour costs in China.

US–China decoupling will have even longer-lasting impacts on GVCs. In the past, the world has benefited from US–China economic partnership in GVCs. The fast pace of digitalisation in the past two decades has come from joint efforts between America's steady stream of new ideas, new products and new business models, combined with China's continuous efforts to drive down the cost of production and provide solutions that are more affordable. Decoupling signals the end of this pattern of international collaboration and the restructuring of GVCs.

Accelerating digital transformation may help Asia increase its importance in GVCs and gain a greater say in global affairs. This will require support from an inclusive international ecosystem that can level the playing field of the digital economy. Free flow of data is vital for 21st century GVCs. Since the application of digital solutions could be equally effective in either facilitating or hindering data flow and the sharing of information,

free flow can only be achieved when there are international rules and regulations that set the boundaries of data use.

The biggest obstacle to global rule-setting is probably not countries' differences in ideology and socio-economic structure, but their lack of trust. This highlights increasing concern about data and privacy protection and cybersecurity.

While the advancement of information technology facilitates the use of data, it also increases the risk of data being illegally leaked, stolen or misused. Free flow of data across borders can only be feasible when there is sufficient trust among countries, backed up by sound laws and regulations.

Asia's existing achievements in regional integration give countries a strong starting point for trust-building. ASEAN-centred bilateral dialogue mechanisms also provide a platform for countries to exchange ideas, which can help enhance mutual understanding and pave the way for negotiation of regional agreements on the digital economy.

It is worth noting that beyond technological progress—the main driving force of digitalisation—many other factors such as the global economic order, geopolitical power shifts and social transformation also affect the progress of digitalisation. Policymakers need to take all these factors into account in forging a path to accelerate digital transformation.

EAFQ

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ASIA PACIFIC CONNECTIONS

Bridging the digital divide

YOONEE JEONG

THE Asia Pacific is both hyper-connected and under-connected. While the region hosts leaders in 5G and fibre rollouts, many developing countries are either largely offline or suffer from unaffordable and unreliable digital services. Closing the digital divide was never more critical than during the COVID-19 pandemic, where populations without broadband access have suffered disproportionately and fallen further behind in education, health and other socio-economic outcomes.

The success of the region's collective digital future hinges on how well and how soon we provide the affordable, accessible, resilient and reliant digital infrastructure needed for the foundation and operation of an inclusive digital society. Securing an inclusive digital future for all, including the most vulnerable, is an urgent policy priority. Achieving this ambition will require rethinking how we view and address the digital divide.

The digital divide between and within countries has not only persisted but is arguably widening. According to International Telecommunications Union, nearly 40 per cent of the population in the Asia Pacific remained unconnected in 2021, with non-users disproportionately concentrated in rural and remote communities and within the female population.

There is also a vast difference in internet quality between and within countries. China's national average mobile broadband download speed (202 Mbps) was nearly 12 times that of landlocked countries in the region, while the fixed broadband download speed in Thailand (109 Mbps) and the South Korea (103 Mbps) were four times higher than the average across the region, according to a 2021 study by the United Nations Economic and Social Commission for Asia and the Pacific.

At this pace, the region will also miss 2025 Advocacy Targets set by the United Nations Broadband Commission for Sustainable Development around universal connectivity, affordability, skills,

> In many developing countries, regulations and market interventions have not kept pace with technological advances

access, equality and use. For instance, 15 ADB developing member countries have yet to achieve the 2 per cent (Gross National Income per capita) affordability target of 1.5 GB for mobile and 5 GB for fixed broadband access per month. When looking at the breakup of this national-level target by income group, affordability remains a problem for low-income segments of the population.

GLOBAL targets have been outpaced by the evolving requirements and consumer behaviour from pandemic-induced digital acceleration. E-learning, remote health and temporary work from home are now essential to full social and economic inclusion, and their data requirements represent a new paradigm for connectedness. A 2021 World Bank report investigating how Indonesia's education system can overcome the losses from the COVID-19 pandemic found that traffic use of learning apps or online schooling was typically around a gigabyte a day, far beyond the entry-level standard by the Broadband Commission. According to proceedings from the Association for Computing Machinery's 2021 conference, video calls on popular platforms like Google Meet and Zoom are particularly resource-intensive and can consume up to a gigabyte of traffic in a single hour.

Looking forward, Ericsson's 2021 mobility report found the monthly global average mobile data consumed per user exceeded 10 GB in 2021 and predicts that global average use will reach 35 GB per month in 2026. This means the current standards of entry-level internet of between one to five GB per person is far from adequate. An ever-increasing bucket of data well beyond the current goals should be available for 2 per cent of Gross National Income per capita to achieve meaningful connectivity.

Simply providing broadband coverage is not enough to meet people's needs. The presence of internet service at an address does not mean the service has the quality to support video calls or data access or has the network capacity to support the applications users require for meaningful participation in the digital economy. Given the duality of digitalisation—as a pathway out of poverty or a tool for misuse and abuse—it is ever more critical to ensure that digital participation leads to net positive development outcomes.

Tracking progress towards access to and adoption of technology is important but insufficient. Existing metrics of digital progress tend to be confined in the silos—mobile, digital finance, digital health and digital government—despite the cross-cutting nature of digital technologies. They also tend to focus on the availability and usage of services without mechanisms for measuring impact.

Achieving universal access will not be easy or cheap. The International Telecommunication Union estimates that US$428 billion is required in investment between now and 2030, a third of which needs to come from public sources.

WHILE digital investment has been and will continue to be the remit of the private sector, there are unique and important roles for development finance from multilateral development banks or other donors to play in closing the digital gap.

One is to assist governments in closing the market efficiency gap by addressing market failures and optimising regulatory and investment conditions for the private sector. In many developing countries, regulations and market interventions have not kept pace with technological advances and licensing structures are not conducive to competition or innovation. As private-sector investment in digital connectivity requires heavy up-front investment and a long runway to recoup costs, governments need to crowd in the

> Collaboration among governments, the private sector and development partners is the key to creating a more prosperous, inclusive, resilient and sustainable digital future

PICTURE: REUTERS / RUPAK DE CHOWDHURI

Children without access to the internet or personal IT devices gather in an open-air class following COVID-19 school closures (West Bengal, 2021).

private sector for much-needed investment and promote market-based solutions by streamlining rules and regulations and improving the business environment.

The second is to contribute to closing the access gap in communities deemed by the private sector to be too expensive to serve due to low population density, difficult terrain or poverty levels. Here, development finance can support governments to fill the gaps through targeted measures like smart subsidies or universal service funds.

Development finance can also encourage innovation—in technologies, business models and use cases—and assist in identifying and demonstrating the feasibility and viability of innovative and emerging technologies in serving the unconnected.

Development finance can augment government efforts to build a digitally literate and skilled society. Lack of digital skills currently prevents many from getting online or limits the ability to get the most out of digital opportunities, creating a usage gap. Poor digital literacy also exposes vulnerable populations to potential threats and abuse such as cyberattacks or scams.

Collaboration among governments, the private sector and development partners is the key to creating a more prosperous, inclusive, resilient and sustainable digital future. We must all do our part to achieve meaningful digital connectivity for all for a successful digital future for our region.

EAFQ

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The views expressed in this article are those of the author and do not necessarily reflect the views of the Asian Development Bank, its management, its Board of Directors, or its members. The article is, in part, based on ADB's upcoming working paper 'Last Mile Connectivity: Addressing the Affordability Frontier' co-authored by Jonathan Brewer, Arndt Husar, and the author.

The latest chapter of the splinternet?

NINA XIANG

THE metaverse—a concept that initially appeared in Neal Stephenson's 1992 science fiction novel *Snow Crash*—has been described as the next chapter of the internet. It will allow people to experience the internet in three dimensions, eventually engaging all five of their senses with immersive technologies. In contrast to today's cyberspace which is centred on the exchange of information, the metaverse has been called the internet of experience.

The nature of the metaverse can be better understood by exploring the context of its nascent development. The saturation of the internet and mobile internet—in 2022 there are 6.64 billion smartphone users or 84 per cent of the world's population—means that consumers and technology platforms need innovation to foster fresh growth opportunities. The COVID-19 pandemic has also changed the way people work, live, entertain and move around, generating long-term demand for activities conducted in virtual environments. These factors have provided an opportunity for the uptake of the metaverse.

> The metaverse is the future of the internet, but without regional and global cooperation it will probably arrive broken and embedded with great inequality

Opinions vary on what the metaverse is and how it should and could evolve. Some digital technology specialists envision the metaverse as a massive and interoperable network of real-time, three-dimensional virtual worlds experienced synchronously by everyone on earth. This is a lofty vision with a low probability of near-term realisation. In reality, the metaverse will largely ride on the existing rails of the internet with additional layers on existing structures.

While some metaverse users will interact with blockchain-based start-ups that enable the exchange of cryptocurrencies and non-fungible tokens and have greater control and ownership of their data, a larger portion of consumers will experience immersive virtual worlds using smartphones and computers on today's centralised big tech platforms. Technology giants like Meta and ByteDance are spearheading the development of more immersive experiences via virtual reality headsets. These companies are likely to maintain their significant market share of internet platforms.

Decentralised platforms based on blockchain, or the so-called new creator economy which Web 3.0 claims to herald, will play a minor role in the metaverse. This is because their resources and capital investments are disproportionally smaller than the big tech companies that are building metaverse products based on existing technology while experimenting with blockchain on the side. The mass adoption of blockchain-based metaverses is not guaranteed and more time is needed to assess its chances of success to become the mainstream technology.

THE metaverse will face similar challenges to those already faced by the Asia Pacific internet sector. One major challenge is data localisation regulations that require companies to store or process data domestically. China, India, Australia, Indonesia and Vietnam have either implemented or plan to implement data localisation requirements and restrictions on cross-border data transfer, a trend likely to expand as nations become more concerned with security and data sovereignty. For companies

operating across Asia, this complicated regulatory landscape will add significant compliance costs, hinder the free-flow of data, slow cross-region operations and hamper innovation.

For example, under China's current data regulations users cannot freely explore virtual worlds hosted outside of their national borders and metaverse builders are forced to create localised versions of their product in each jurisdiction. China's great firewall will persist into the metaverse. Its tight policy of online gaming and game consoles is an indicator of how the Chinese government will likely censor and control metaverse content extensively. If more countries adopt China's strict data regulations the most likely outcome is a splinternet where products, users and data are enclosed in separate pools by regulatory schemes.

The collection of sensitive personal data poses another challenge to the metaverse. Virtual reality headsets equipped with sensors that track eye, hand and body movements will eventually monitor individual facial expressions and vital signs. It is increasingly likely that governments will localise data processing and storage and impose vigorous regulatory frameworks to address data security and privacy. This may compound the likelihood of a splintered collection of local networks rather than a globally connected metaverse.

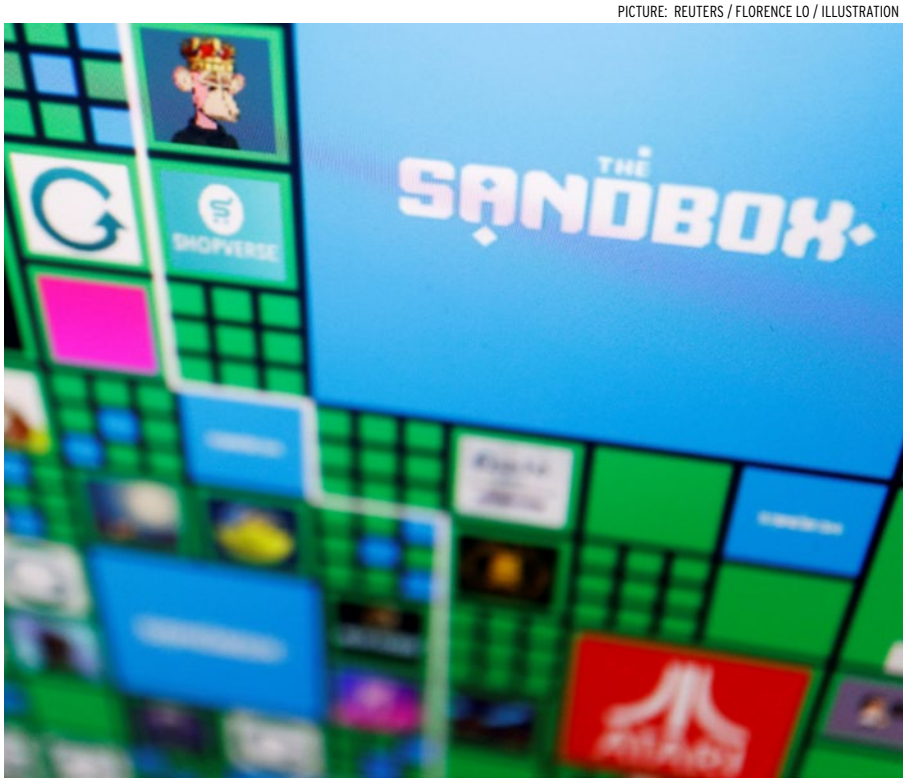
These challenges are part of broader regional fragmentation along regulatory, geopolitical, ethical and cultural lines in the Asia Pacific. Technology regulations in China have severed Chinese cyberspace from the rest of the world. India has banned more than 270 Chinese apps believed to pose a threat to national security since 2020. The interconnected tech ecosystem between the two countries no longer exists. Other countries are becoming battlegrounds for Chinese and US tech giants fighting over market share and influence. Such fights make them more likely to adopt measures to ban metaverse content, as they currently do with online gaming content.

This swirl of technical, governmental and commercial sources of internet fragmentation is likely to fracture the future virtual world by lowering the interoperability and interconnectedness of the metaverse. In this scenario the metaverse will be born with an inherited defect,

PICTURE: REUTERS

Chinese moviegoers enjoy a virtual reality movie at Er Dong Pictures (Beijing, 2019).

PICTURE: REUTERS / FLORENCE LO / ILLUSTRATION



A screen displays virtual land plots on The Sandbox, a gaming platform that allows users to build a virtual world using non-fungible tokens (NFTs).

mirroring the increasingly divided nature of our physical world.

BUT steps can be taken to mitigate these challenges and maximise the positive applications of the metaverse.

First, countries should cooperate on developing metaverse business applications. By removing the legal and regulatory barriers to making consumer applications, businesses can foster regional collaboration. A three-dimensional metaverse could increase the ease with which professionals in different countries can work together on architectural design or product development projects. The quality of education and training currently delivered using traditional video conference could also be greatly improved in a more interactive metaverse.

Governments could also use the metaverse to address common challenges such as climate change and the development of alternative energy. For example, the use of digital twins—the virtual representation of an object or process—can more accurately predict the impacts of climate change. This presents an immense advantage to island nations dealing with the devastating effects of climate change.

Second, the region can address unequal access to the internet and technology. Across Asia there are vastly different levels of economic development, meaning the development of the metaverse will be highly uneven. Around 65 per cent of mobile subscribers in the Asia Pacific will still be using a 4G connection in 2025, with a further 12 per cent relying on 2G or 3G technologies. Efforts to pioneer new technologies should be balanced with looking after those left behind. If the metaverse is where people will interact and conduct much of their lives and work, leaving a large proportion of Asia's population behind would betray the benefits promised of more intimate connections and facilitation of remote work.

Finally, governments and private companies should strengthen regional cooperation in a targeted fashion. As geopolitics becomes entangled with technology, it is increasingly difficult to pursue pan-regional coordination in sectors as broad as the metaverse. It is more realistic for organisations and private enterprise alliances to pursue specific objectives, such as hardware makers setting standards for virtual- and augmented-reality headsets. Efforts to increase interoperability among different metaverses are less likely to yield concrete outcomes.

The metaverse is the future of the internet, but without regional and global cooperation it will probably arrive broken and embedded with great inequality. It faces similar challenges to those plaguing today's internet ecosystem and may further entrench fragmentation. Although the splinternet is likely to deepen over the next few decades, there are options to alleviate the potential impacts of a broken metaverse and to maximise its positive applications. Exploring those avenues should be the goal of all stakeholders in the Asia Pacific.

EAFQ

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