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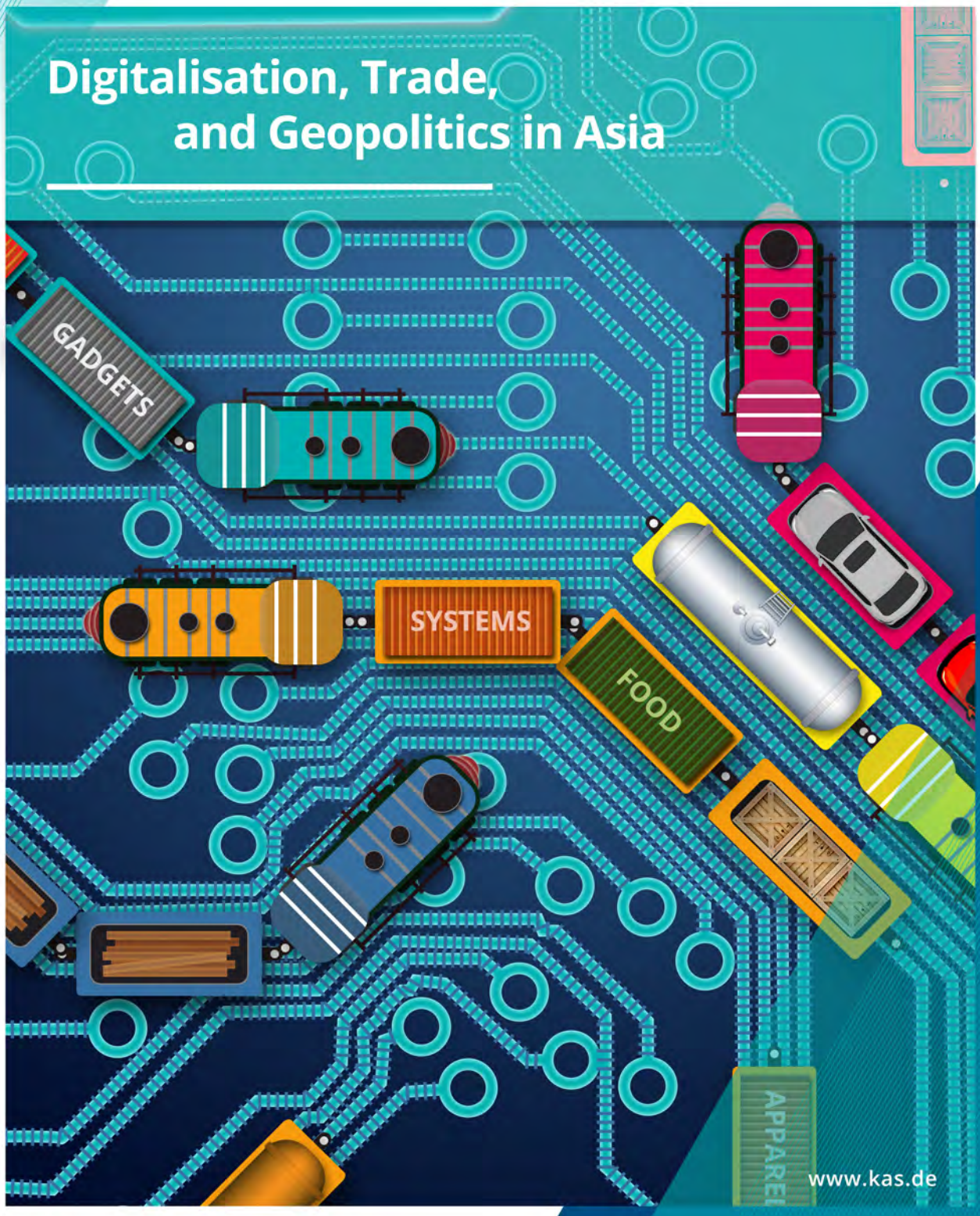
Digitalisation, Trade, and Geopolitics in Asia



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Foreword

Digitalisation has increased the scope, scale and speed of trade. It has also reduced costs, facilitated coordination of global value chains (GVCs) and globally connected a large number of firms and consumers. Although digitalisation lowers the entry barriers to international trade, it also gives rise to new and complex business models, trade transactions, and policy issues.

The papers in this volume "Digitalisation, Trade, and Geopolitics in Asia", published by the Konrad Adenauer Stiftung's (KAS) regional program on "Social and Economic Governance in Asia (SOPAS)" investigates how digitalisation is changing our understanding of trade and the international economy. It assesses the impact of digitalization to production, consumption, and trading patterns as well as national and multilateral regulatory frameworks (including those agreed in regional free trade agreements). It also looks at the evolving roles and configurations of economic actors (e.g. WTO, multinational corporations, digital platforms) and provides a discussion on the issues involving e-commerce and new technologies (i.e., block chain).

We hope that the publication can contribute to a better understanding of how digitalization alters the nature and scale of trade. The debates initiated in this volume intends to enrich discussions in Asia as well as connect these with the developments in Germany and the EU, leading to the creation of flexible, efficient, and resilient economic governance frameworks both at the national and multilateral levels.

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Introduction

The world is witnessing a sudden and swift global adjustment towards intensive digitalisation. This process started many years ago, however the current hurtling pace was not predicted to be reached until at least the middle of this decade. The Covid-19 pandemic has pushed the world into a future that it is still preparing for. This is equally true for Asia. This region has, however, prepared for the impact of this shift, as has been seen by how many Asian countries have swiftly adjusted to these new realities. Indeed, without an existing digital stronghold, the pandemic could have caused far greater damage to economies, notably since the policy of lockdowns has essentially stopped physical movements and commerce.

This series of papers provides us with a picture of the state of digitalisation in Asia prior to the pandemic, and to a certain extent, during the pandemic. Written by regional scholars and practitioners, they provide a rich source of understanding of how Asian countries have been preparing for digitalisation, in the aspects of trade, domestic commerce, firms, industry and labour capacities, regional arrangements, geopolitical implications and individual country adaptations. Overall, the scholars fundamentally converge on the need to have a regional framework to govern the digitalisation process. This is primarily due to the differences in readiness, openness, capitalisation and regulatory capacity to manage possible benefits and costs.

The papers are arranged as follows:

1. **Strategic Trade Policy in the Age of Digital Trade: Implications for Asia** by Qian JIWEI
2. **Global Value Chains, Digitalisation, and Digital Readiness: a Firm-level Analysis with a Focus on Asian Small and Medium-sized Enterprises** by Upalat KORWATANASAKUL
3. **Trade Finance and Block Chain Usage in the Asia-Pacific** by Saon RAY
4. **The Uneasy Relationship Between Labour and Digital Trade** by Rogelio Alicor PANAO
5. **Digital Trade in the Asia-Pacific** by Deborah ELMS

6. **The Impact of Digitalisation in Trade Patterns of South Asia** by Aashinaya ADHIKARI

7. **Digital Infrastructure Development Along the Digital Silk Road: How to Balance Digital Trade and its Security Risks** by Younkyoo KIM

8. **Framework for India's Cross-border E-commerce** by Sharmila KANTHA

These papers are designed to provide the reader with a comprehensive understanding of digitalisation, and of how it is changing the way of doing business across regions and nations. Qian Jiwei provides a good introduction of how digitalisation is improving the production of firms, and providing better choices for consumers. Upalat Korwatanasakul looks at the global data on small and medium enterprises (SMEs), and focussed on Asia. He finds that many SMEs in Asia are not prepared to participate in the digitalised global value chain. Saon Ray highlights the need to simplify the financial processes of trade; with goods and services moving faster due to digitalisation, their financial counterparts remain too stiffly regulated. She cites the possibility of using blockchain technology to overcome this challenge. Rogelio Alicor Panao examines the size of the industrial sector and finds that countries with a larger industrial sector are likely to be slower in adapting to the digitalisation of trade, given that a vulnerable labour sector must prepare for the shift to services. Deborah Elms focuses upon the arrangements that can facilitate digital trade in the Asia-Pacific beyond the World Trade Organisation (WTO). They highlight the need for a regional digital trade arrangement, especially as the region becomes more integrated into the global environment. Aashinaya Adhikari compares the digitalisation adaptation processes of countries in South Asia, and the imbalances they face. She calls for a good governance mechanism to manage and facilitate digital adaptation. Younkyoo Kim considers the geopolitical implications of digitalisation and compares the different routes taken by East Asian nations in their own digitalisation adaptations. Finally, Sharmila Kantha presents the current state of and challenges to digitalisation in India, and details policy options for its long term success.

The aim of these papers is to direct discussion towards the question of what the global and regional arrangements of trade will be after the Covid-19 pandemic. They further aim to highlight the nuances and specificities of digitalisation within the Asia-Pacific context, and to examine what the region may expect moving forward.

Alvin ANG is currently a Professor at the Department of Economics of Ateneo de Manila University, where he is also Director of Ateneo Center for Economic Research and Development (ACERD). He has taught at the University of Santo Tomas and Ateneo de Manila University and has served as adjunct faculty at the Asian Institute of Management, Development Academy of the Philippines and Nazarbayev University in Kazakhstan.He earned his PhD in Applied Economics at Osaka University Graduate School of Economics and his Masters degree in Public Policy from the National University of Singapore.

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Strategic Trade Policy in the Age of Digital Trade: **Implications for Asia**

Jiwei QIAN

Abstract

There are two aspects of digital trade: the digitalisation of goods/services being traded and the digitalisation of the transactional act. Digital data (i.e. machine-readable industrial data and transactional data) is the major driving force for both aspects of digital trade. Digital data is a non-rivalrous input, whether for production or marketing activities, and is thus able to be used by many firms or government agencies without limiting the use of others. In other words, the digitalisation of trade provides increasing returns to scale. Digital platforms also have network externality effects under which a large number of users are likely to improve the effectiveness of the data services provided by the platform. Digital platforms provide online infrastructure for the interactions between groups, for instance, consumers and producers. The externality effect refers to the situation in which prosperity in one group on a given platform will improve the returns of other groups on the same platform.

In the literature, countries may use strategic trade policy to raise the national income at the expense of firms in other countries to ensure domestic firms get excess returns. Employing trade policies to exploit the increasing returns to scale in trade and externality effects is not a new idea for policymakers and scholars. Scholars have highlighted the role of trade policy in the economic growth of the East Asian tigers after the Second World War. Export subsidies and import restrictions were viewed as critical for some East Asian economies in the late 20th century.

In the era of the data-driven economy, strategic trade policy can involve data-related policies. The major objective of these policies is to improve the competitiveness of domestic firms. For instance, firms may be subsidised if they use cloud services provided by specific platforms. This strand of strategic trade policies might be useful for increasing the competitiveness of small- and medium-sized enterprises (SMEs) via the digitalisation of production/marketing processes. Alternatively, strategic trade policy may also exploit the externality effect via platform economy-related policies. Further, some countries may form data coalitions to facilitate cross-border data flow. This paper uses cases in Asian countries to illustrate which role these strategic trade policies can play in the digital economy.

Keywords: *Strategic Trade Policy, Externality effect, Increasing returns to scale, Digital platform, Cloud computing, New Trade Theory, Asia*

Introduction

The digital economy is measured as the sum of information and communications technology (ICT) manufacturing/services and the value-added from ICT inputs in other sectors (OECD 2018). Digital trade forms one dimension of the digital economy; it has, however, been growing in significance with the economy's deepening digitalisation.

There are two aspects of digital trade: the digitalisation of goods/services being traded and the digitalisation of the transactional act.[1] The digital economy is considered to have entered a stage where digital data is its major driving force (European Commission 2014). Digital data is machine-readable and considered to be the core of ICT technologies, such as the 5th generation mobile network (5G), Artificial Intelligence (AI) and cloud computing (UNCTAD 2019).

One of the most important features of the data-driven economy is that the digitalisation of trade has increasing returns to scale. The predominant reason behind this is that digital data is a non-rivalrous input for production.[2] In other words, it generates marketing activities that have the potential to be used by many firms or government agencies without limiting the use of others. Therefore, data sharing, and the flow of digital data across economic agents, has implications for efficiency and competition (Carriere-Swallow et. al 2019; Goldfarb and Tucker 2019, Jones and Tonetti 2020). The free flow of cross-border data can also reduce transactional costs for companies and individuals desirous of engaging in economic activities in the international market. For instance, in 2014, Mckinsey & Company estimated that global data flows raised global GDP by 3.5 per cent (Meltzer and Lovelock 2018). Data sharing policies are also widely employed. For instance, in the US, open format data are available to the government, academia, businesses and other organisations through "application programming interfaces" (APIs) at zero cost. (Hughes-Cromwick and Coronado 2019).

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1 *Also see https://www.oecd.org/trade/topics/digital-trade/ accessed 22 August 2020.*

2 *Rivalry refers to the case that "one person's consumption of a product reduces the amount available for consumption by another". See https://www.britannica.com/topic/public-good-economics*

Another feature of the data-driven economy is that there are externality effects,[3] mainly from digital platforms. In this context, the externality effect refers to the situation in which prosperity in one group of a given platform will improve the returns of other groups on the same platform. Digital platforms provide online infrastructure for the interactions between groups, such as consumers, and producers. Externality in this context means that more producers subscribing to the platform implies higher value-added for consumers in that same platform.

In the past decades, international trade had been largely liberalised and tariffs have been reduced to historic lows. For instance, between 1994 and 2006, applied tariff rates in the world have decreased from 8.57 per cent to 3.16 per cent.[4] In view of this, trade policy has been considered as a relatively unimportant field of academic research with regard to world trade (Goldberg and Pavcnik 2016).

However, in a data-driven economy, policy intervention could regain its relevance for international trade. In principle, with increasing returns to scale, there could be "multiple equilibria", and under different equilibria, the market structure could be dramatically different (Hoff and Stiglitz 2001, Myerson 2004). The government can use data-related policy to select equilibria by changing firms' strategic decisions.

Employing trade policies to exploit the increasing returns to scale in trade and externality effects is not a new idea for policymakers and scholars. Scholars on economic growth and development have highlighted the role of trade policy in the economic growth of the East Asian tigers after the Second World War (Amsden 1992, Industry Commission 1990, Wade 2004). Export subsidies and import restrictions were considered as critical for the economies of Japan and Korea in the late 20th century. In this way, governments can use subsidies, tariffs and other interventions to protect and help promote domestic "infant industries".

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3 *Externality effect refers to "effects on agents other than the originator of such activity which do not work through the price system". (Laffont 2008). In the context of digital platform related research, it was sometimes referred as "network externality" (See Liebowitz and Margolis 1994).*

4 *World Bank Database: https://data.worldbank.org/indicator/TM.TAX.MRCH.WM.AR.ZS , accessed on October 5, 2020.*

In this paper, we argue that certain data-related policies in the era of the data-driven economy could be considered as strategic trade policies. The major objective of these policies is to improve the competitiveness of domestic firms. For instance, firms may be subsidised if they use cloud services provided by specific digital platforms. This strand of trade policies might be useful for increasing the competitiveness of small- and medium-sized enterprises (SMEs) via the digitalisation of production/marketing processes. Further, this policy can exploit externalities related to digital platforms.

Alternatively, a strategic trade policy may also exploit increasing returns to scale by improving data infrastructures, such as 5G, to facilitate digital trade. Additionally, countries can form data coalitions to support cross-border data flows at the firm level.

This paper uses cases in several Asian countries to show which role these strategic trade policies can play in the data-driven economy. These cases include the formation of the data coalition between the European Union (EU) and Japan; Korea's policies in supporting the development of the platform economy; and China's policies in upgrading their data infrastructure. We argue that while these policies might facilitate digital trade, the overall welfare effect (i.e. national income growth) could be ambiguous.

Trade in the Data-driven Digital Economy

Digital trade is driven by digital data, which is critical not only for ICT industries but also as a factor input for manufacturing and services in general. The growth of cross-border data flow has been dramatic. The size of cross-border data flow increased by a factor of 45 between 2005 and 2014 (i.e. from 4.7 TB in 2005 to 211.3TB in 2014).[5] Further, over 12 per cent of international trade in goods occurs via cross-border e-commerce (Meltzer 2020). In this section, we argue that digital data as a production input is associated with increasing returns to scale and externality effect for a number of reasons, which shall be outlined below.

Firstly, data input could form a non-rivalrous input for production able to be used by many firms or government agencies without limiting the use of others (OECD 2015). For instance, digital platform companies often combine

5 *https://unctad.org/meetings/en/Presentation/tdb_ede3_2019_p03_JMeltzer_en.pdf, accessed on October 4, 2020.*

their dataset with open government data to produce analytics that contribute to increased operational efficiencies, reduction in costs, improved inventory and distribution management, and which offer new revenue-generating services (Hughes-Cromwick and Coronado 2019).

Secondly, data sharing, and the flow of digital data across economic agents, can improve efficiency and productivity in production, distribution and other economic activities — in particular when combined with AI technology. The first generation of AI relies on building logical rules to make decisions. The new generation of AI technology — machine learning —is highly data-intensive, and is based on statistical predictions (Wooldridge 2020). Relying on the huge size of data with labelled "training sets", a machine learning algorithm can infer the data pattern in other databases.

For example, Alipay, the payment arm of Ant Group in China, currently serves over 80 million businesses, 1 billion users, 2,000 financial institutions and 2 million mobile apps[6]. The data that are generated by these users form the basis of Ant Group's comparative advantage. Employing AI and in particular machine learning technology, Ant Group use massive digital data to generate data analytics to increase operational efficiencies, reduce costs, and control risks.

Thirdly, digital platforms have externality effects. Digital platforms can play an important role in data sharing, data flow, and data services. Platforms in general can be defined as "mechanisms bringing together a set of parties to interact" (UNCTAD 2019). Digital platforms, such as Google, Facebook, and Amazon, provide online infrastructure for the interactions between groups, such as consumers, and producers (UNCTAD 2019).

For instance, personal data collecting by digital platforms is considered to be commercially valuable for firms. It has been used by platform companies such as Google, Facebook and others in online advertising, generating revenue to the tune of 178 billion USD in 2018.[7] Data brokers trade personal data to

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6 *http://static.sse.com.cn/stock/information/c/202008/e731ee980f5247529ea824d20f-cdb293.pdf, accessed on 28 October 2020.*

7 *https://www.strategy-business.com/article/Tomorrows-Data-Heroes?gko=7b095, accessed 22 August 2020.*

banks and other firms, generating an annual revenue of over 21 billion USD in 2018.[8]

In addition, data services offered by digital platforms, in particular cloud computing, are useful for small firms to improve their productivity. A "cloud" service is a data centre that rents out its services for storage, computing, or other applications. It is often labour-intensive and expensive for firms to collect and organise their data. For instance, a retailer would need a system to collect sales data, combined with other datasets such as inventory data, logistics data and customer data, and would need to organise the data into a database. In view of this, it is more efficient for firms to purchase virtually any amount of cloud services from a third-party service provider specialising in data storage and data management. Such options enable even small companies to start at a minimal level and be charged based on usage.

Such services can be AI-related, such as natural language processing, voice recognition, facial recognition, knowledge graphs, intelligent recommandations, and so forth. Once more SMEs subscribe to data services, the platforms become more attractive for other groups which also subscribe to the platform, such as consumers. This is because an increased presence of SMEs means that the platform can provide a larger variety of goods and services.

Strategic Trade Policy in Data-driven Economies: Old Wine in a New Bottle

Strategic trade policy is built upon the theory of imperfect competition in economics. Unlike perfect competition — in which firms have little room for strategic behaviour as regards price-setting and output level — under imperfect competition, firms can make use of several strategies, such as choosing output or price levels.[9] The gist of strategic trade policy is that firms/government responses to commercial policy, such as tariff/subsidies, will affect profits/revenues of firms in other countries (Brander and Spencer 1985).

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8 https://www.strategy-business.com/article/Tomorrows-Data-Heroes?gko=7b095, accessed 22 August 2020.

9 In other words, imperfect competitors "face downward-sloping demand curve or upward-sloping supply curve" (Makowski 1987).

Besides imperfect competition, another reason to justify strategic trade policy is the externality effect. For instance, business location decisions produce a positive externality effect when many firms choose to locate in the same county. Firms are more likely to benefit from ideas, resources, human talents from firms located in the same country. Based on the "new" trade theory, the government can use policy to change the location decisions of firms to internalise the externality (Krugman 1980; Ossa 2011). For instance, the government can choose a particular tariff level in order to acquire a larger share of manufacturing production at the expense of other countries.

Under imperfect competition and location externalities, it is possible to have multiple equilibria in the economy. Policy intervention is therefore relevant when determining which equilibrium will emerge. In other words, which equilibrium to emerge depends on initial conditions, transaction costs, and what kind of policy intervention has been imposed (Hoff and Stiglitz 2001). In other words, policy intervention could induce the economy to end up in a particular equilibrium (Hoff and Stiglitz 2001: 396).

It is worth remembering, however, that in mainstream international trade literature, if strategic trade policy is useful, it is also highly context-dependent. For instance, in Eaton and Grossman (1986), it is argued that the strategic use of subsidies is highly sensitive to market structure.[10]

While in principle it could be welfare improving, strategic trade policy is controversial in the literature. For instance, the World Bank's report *East Asian Miracle* argues that the role of the state in East Asian countries is very important in several areas, such as controlling the inflation rate, or as regards human capital accumulation. However, they further note that the 'strategic interventions' such as trade policy and industrial policy, 'generally did not work' (World Bank 1993: 354).

There are alternative views about the post-war experiences in East Asian economies. It has been well recorded, for instance, that in the steel and textiles sectors, the governments of South Korea and Taiwan in the 1960s employed a wide range of subsidies to offset Japan's higher productivity (Amsden 1992, Wade 1993). These policies can be considered as strategic

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10 *It depends on whether it is Cournot duopoly or Bertrand duopoly. Under Bertrand duopoly, a tax on exports raises home welfare. Under Cournot duopoly, subsidies to exports should be implemented. See Eaton and Grossman(1986).*

trade policy since the policy changes induced strategic responses at the firm level. Another illustration can be seen in the case of Korea in the 1960s and 1970s, in which receiving government subsidy was conditional on meeting export targets (Amsden 1992).

Recent Developments in Digital Trade in Some Asian Countries

The Uruguay round of the General Agreement on Trade and Tariff (GATT) talks managed to introduce a worldwide tariff cut in 1995. The emergence of the World Trade Organisation (WTO) afterwards was a signal that unimpeded global free trade was going to be achieved. The relevance of trade policy further lessened in the literature, since in the ensuing years tariff levels reached historical lows (Bown 2014, Goldberg and Pavcnik 2016).

However, since the 2010s, trade policy has grown in importance anew, notably due to the shocks felt by the local labour market in the US after China entered the WTO in 2001. The US' manufacturing employment, concentrated the Midwest and Southeast of the country, have been subject to particularly strong shocks following China's accession (Autor et al. 2013a,b). Tariffs have again become a very important policy instrument. Since early 2018, the US and China have both significantly raised tariffs on goods from each other and warned of further increases (Qian 2020).

Unlike the case of traditional trade policy (e.g. tariff, quota, etc), in the data-driven digital economy, data-related policies could be interpreted as strategic trade policy under which firms are likely to respond by adjusting their strategic behaviours.

Japan: Forming a Data Coalition

The act of forming a data coalition is a policy direction undertaken to change companies' strategic decisions. Facing different types of data regimes, firms may choose to reshape their business models, relocate part of their operations, and sometimes exit the market entirely. These firm-level decisions have profound implications on industry competitiveness and market dynamism. The formation of a data coalition, which creates a single data market, will have a significant effect on market size, the establishment of data standards, as well as a persistent effect on market structure (Batikas et al. 2020, Johnson et al. 2020). While forming a data coalition is not considered to be part of the traditional types of trade policy (e.g. subsidies, tariffs, etc), it serves the same

purpose. It does this by expanding market access for domestic firms, and inducing more resources to be allocated to domestic firms, which can then access the international market.

The cross-border flow of non-personal data has been promoted by the European Union (EU) for improving industry productivity. In May 2019, the EU had enacted a new regulation on data flow, applicable to all EU member states. This regulation creates a framework for the free flow of electronic non-personal data in the EU for enhancing the competitiveness of the EU industry.[11]

Given this framework, Japan moved fast in terms of forming a data coalition with the EU. In 2018, Japan and the EU recognised each side's data regulation following the implementation of the General Data Protection Regulation (GDPR) in the EU.[12] On January 23, 2019, the European Commission (EC) issued its adequacy decision (i.e. adequate level of data protection) on Japan. It is the first time that the EU and a third country have agreed on mutual recognition of an 'adequate level' of data protection after the implementation of GDPR[13].

The EU-Japan Economic Partnership Agreement (EPA) was enacted in 2018. Within three years (2018-2021), the provision on the "free flow of data" will be reassessed by both parties. If the free of flow of data is approved, the Japan-EU coalition will be the largest area of safe data flows in the world.[14]

Korea: Promoting the Platform Economy

Digital platforms are becoming increasingly important in the world economy. Revenues from various digital platforms including e-commerce, e-services,

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11 *https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R1807 and https://ec.europa. eu/digital-single-market/en/news/free-flow-non-personal-data, accessed 22 August 2020.*

12 *https://www.skadden.com/insights/publications/2018/09/quarterly-insights/data-protection-in-japan-to-align-with-gdpr , accessed 22 August 2020.*

13 *https://www.schirrerwalster.lu/japan-eu-adequacy-agreement-gdprs-first-country-country-test-means-asian-businesses/ , accessed 22 August 2020.*

14 *https://www.gdprtoday.org/european-commission-adopts-adequacy-decision-on-japan-creating-the-worlds-largest-area-for-data-flows/, ,accessed 22 August 2020.*

and others, reached 3.75 trillion USD in 2019, equivalent to 4.4 per cent of global GDP.[15]

Digital platforms are also associated with increasing returns to scale. Some of these digital platforms provide data services, such as cloud computing, to small firms to improve their productivity. As mentioned above, policies supporting platforms providing AI-related services can improve the productivity of firms subscribing to said services. Further the quality of AI-services increases with the size of data available for the platform.

In addition, the digital platforms are likely to have externalities, therefore prosperity in one group on a platform will improve the returns of other groups on the platform. In particular, with connecting devices in factories with software applications, digital industrial platforms offer cloud-based services for predictive and automated maintenance, digital integration of value chains, or customisation of design and production (Borangiu et al 2019). Data collected from individual firms by the platforms can further refine the effectiveness of the AI-related cloud services they provide.

In 2018, the Korean government announced a series of policies to support the platform economy, with a fund amounting to 4.5 billion USD.[16] Two platforms — including one platform for AI-related services and another enabling the supply chain of hydrogen fuel cells — are the major focus.[17] The detailed policies to support the development of the platform economy include providing fiscal subsidies for SMEs to use AI-related services and promoting the platform for digital trade

Policies include supporting the supply chain of the hydrogen fuel cell as regards production, storage, transportation and usage,[18] as well as subsidises

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15 *Asian Development Bank, Asian Economic Integration Report 2021, forthcoming.*

16 *https://www.koreatimes.co.kr/www/biz/2018/08/367_253635.html, accessed 22 August 2020.*

17 *https://tokenpost.com/South-Korea-to-invest-over-1-trillion-won-in-big-data-blockchain-and-sharing-economy-in-2019-137, accessed 22 August 2020.*

18 *https://tokenpost.com/South-Korea-to-invest-over-1-trillion-won-in-big-data-blockchain-and-sharing-economy-in-2019-137, accessed 22 August 2020.*

to fuel cell vehicles, and the expansion of hydrogen filling stations.[19] With policy support, such a supply chain is more likely to internalise the externality (e.g. induce knowledge spillovers) generating benefits throughout firms in the supply chain.

China: Upgrading Data Infrastructure

The development of data infrastructure, such as 5G, is expected to change strategic decisions at the firm level. 5G can significantly improve the speed of digital data communications via the internet, and facilitate data flow and data sharing. Many AI-based services, provided by cloud computing, are also relying on the availability of data storage centres. With an upgraded data infrastructure, more domestic digital-related economic activities will be supported. In turn, firms are willing to invest more on research and development (R&D) and on industrial upgrading.

As with the case of data coalitions, or the support of the platform economy, building data infrastructure is not a traditional type of trade policy. However data infrastructure can shift the cost and benefits calculations undertaken at the firm level. China has implemented a series of policy initiatives on the development of data infrastructure. In May 2020, a government work report saw the first mention of the term "New Types of Infrastructure", which includes data infrastructures such as 5G, big data storage centres, AI, and industrial internet.[20]

Data infrastructure building has been partly funded by the government, but the private sector is supposed to play an important role. For instance, in Shanghai, three quarters of total investment in "new types of infrastructure" between 2020 and 2022 will be financed by the private sector, amounting to over 210 billion RMB.[21]

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19 *https://www.electrive.com/2019/09/02/south-korea-announces-ev-subsidies/, accessed 22 August 2020.*

20 *http://industry.people.com.cn/n1/2020/0527/c413883-31726379.html, accessed 22 August 2020.*

21 *http://www.21jingji.com/2020/5-8/zMMDEzNzIfMTU1ODEzMw.html, accessed 22 August 2020.*

The China Centre for Information Industry Development (CCID), a think tank under the Ministry of Industry and Information Technology, estimated in March 2020 that the total investment on data infrastructure and related industries will reach about 10 trillion RMB by 2025 (Table 1).

Table 1. "New types of infrastructure" investment by 2025 (trillion RMB)

	Direct investment	Total investment
5G	2.5	5
Big data storage centres	1.5	3.5
Artificial intelligence related infrastructures	0.22	0.4
Industrial internet	0.65	1
TOTAL	**4.87**	**9.9**

Source: Estimated by CCID thinktank, March 2020.

Discussions and Conclusions

The Covid-19 pandemic has served to further the expansion of digital data. The EU's bandwidth growth in Internet Exchange Points reached 19 per cent in the first quarter of 2020, compared to 10 per cent in the 4th quarter of 2019 (OECD 2020). As noted, digital trade can be facilitated by data-related policies. In this manner, the government uses policy instruments to accommodate and/or intensify the digitalisation of the economy. Firms may be subsidised if they use cloud services provided by platforms, the competitiveness of domestic SMEs may be boosted via digitalisation or by data coalitions to facilitate cross-border data flow, and data infrastructure can magnify returns in R&D in AI-related services. These policies all have the capacity to change firm-level strategic decisions and may thus be considered as strategic trade policy.

There are further implications across industries. Some sectors make more intensive use of data. If we consider digital data as a production factor, then digital trade might be of proportionately greater benefit to those sectors which use data more intensively.[22] This is a relevant point for policymakers. For instance, competition policy enforcement might need to be reframed to

22 *This is a speculation drawn from the Stolper-Samuelson theorem. See Feenstra (2015). Page 55.*

accommodate the changes of market structure under the digital economy, e.g. the market power of digital platforms (Crémer, et al 2019).

As discussed in this paper, in the era of the data-driven economy, data-related policies could be used to exploit increasing returns to scale and externality effects. While these strategic trade policies might be useful to facilitate digital trade and the digital economy, it is still ambiguous whether or not they are fundamental for economic growth. Some cross-country studies show that once the quality of institutions (e.g. constraints on executives) have been controlled for, economic performance is not correlated with particular policies (Acemoglu et al., 2002; Easterly 2005). However, some scholars argue that industrial policy and trade policy are more effective to promote economic development as compared to institutions which are "one size fit all" (Chang 2011; Rodrik 2008).

As previously noted, although it remains unclear whether or not strategic trade policy produces a beneficial welfare effect (i.e. national income/economic growth), some governments have a strong incentive to employ it with the goal of promoting the competitiveness of domestic industries. A pollical economy explanation might be needed in this context. From the perspective of the political economy of international trade, the choice of strategy is more likely to be related to how special interest groups are formed in the arena of trade, e.g. Rogowski 1989 discusses broad coalitions driven by trade in the 19th century. In this context, whether a regional digital trade agreement will be reached might be contingent on the domestic power structures in individual countries.

In the literature, trade policies (e.g. whether to violate WTO subsidy rules and EU state aid rules) are associated with countries' institutions (Rickard 2018). This paper shows that countries with very different institutions can choose different types of strategies to improve the revenue of domestic firms. How to understand different types of strategies being employed in different countries is a very interesting question worth future research.

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2

Global Value Chains, Digitalisation, and Digital Readiness: **a Firm-level Analysis with a focus on Asian Small and Medium-sized Enterprises**

Upalat KORWATANASAKUL

Abstract

During the past decades, scholars and policymakers have been debating about the mechanisms between digitalisation and global value chain (GVC) participation, and about the concerns over the uneven benefits they create. Against this backdrop, this study aims to disentangle the relationship between GVC participation and digitalisation at the firm level, with a focus on small and medium-sized enterprises (SMEs) in Asia. The main estimation methods are probit and tobit regression analyses using pooled cross-sectional data from the World Bank's Enterprise Surveys. The data covers 117 countries and 48,899 firms for the 2007-2019 period. The estimated results of both models highlight the importance of digital connectivity for GVC participation, and the greater positive effect of digital connectivity for SMEs, as opposed to large firms. In addition, this study also evaluates the digital readiness of Asian enterprises, and provides some policy discussion points based on the analyses. Overall, Asian SME digital readiness is insufficient and has large room for improvement. A holistic policy is required to improve SME digital readiness in the areas of finance, supporting infrastructure, and labour capability.

Keywords: *Digitalisation, global value chain (GVC), digital readiness, small and medium-sized enterprises (SMEs), Asia, firm-level analysis*

JEL Classification: F13; F14; F63; L11; O24

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1. Introduction

Small and medium-sized enterprises (SMEs) are significant contributors to economic activity and employment worldwide; Asia is no exception, where SMEs represent the majority of firms and domestic employment. According to a 2020 report by the Asia-Pacific Economic Cooperation (APEC) forum, approximately 97 per cent of companies in Asia are considered SMEs. SMEs also contributed considerably to national gross domestic product (GDP) in the region, accounting for 20-50 per cent. Nevertheless, despite SMEs' important economic contributions, their participation in international trade and global value chains (GVCs) remains limited. The export volume of SMEs made up only 35 per cent or less of the total export in the region, while large enterprises dominate international trade and GVCs. This unbalanced GVC participation between SMEs and large enterprises leads to an unequal distribution of its benefits and opportunities. The rise of digital technology, meanwhile, also presents SMEs with new challenges and opportunities. While digitalisation may help SMEs to reduce costs associated with different functions along value chains, the digital divide between small and large firms can aggravate the problem of unbalanced GVC participation.

GVC participation and digitalisation benefit SMEs in several ways, for instance by enhancing capabilities and competitiveness, improving product quality, encouraging financial stability, and enabling the discovery of new markets. Both extend the business opportunities of SMEs, and allow SMEs to connect with foreign suppliers and leading global firms. The interaction between SMEs and foreign firms enables the former to absorb business know-how and advanced technology. However, to enter GVCs, SMEs are required to meet the standards of international markets and lead firms, which generally impose high costs of compliance to SMEs. The relative constraints suffered by SMEs in terms of economies of scale, access to finance and information, and technological capacity mean they are less likely to meet such standards and costs (Korwatanasakul 2019; Korwatanasakul and Intarakumnerd 2020). These same constraints also pose challenges to SMEs in terms of the adoption and utilisation of digital technology, where SME digital readiness remains at an unsatisfactory level.

During the past decades, scholars and policymakers have been debating about the mechanisms between digitalisation and GVC participation, and about concerns over the uneven benefits they create. Against this backdrop, this study aims to disentangle the relationship between GVC participation

and digitalisation at the firm level, with a focus on SMEs in Asia. The main estimation methods are probit and tobit regression analyses using pooled cross-sectional data from the World Bank's Enterprise Surveys. The data covers 117 countries and 48,899 firms for the 2007-2019 period. The estimated results of both models highlight the importance of digital connectivity for GVC participation, and the greater positive effect of digital connectivity for SMEs, as opposed to large firms. In addition, this study also evaluates the digital readiness of Asian enterprises, and provides some policy discussion points based on the analyses. Overall, Asian SME digital readiness is insufficient and has large room for improvement. A holistic policy is required to improve SME digital readiness in the areas of finance, supporting infrastructure, and labour capability.

2. SME participation in GVCs and the Role of Digitalisation

2.1 SMEs and GVC participation

SMEs are the engines of economic growth in most Asia-Pacific economies, particularly in developing countries, as they contribute significantly to economic development, as well as to job creation. SMEs account for over 97 per cent of businesses, and employ more than 50 per cent of the national labour force in the region (APEC, 2020). They contribute approximately 20-50 per cent of the gross domestic product (GDP) (APEC, 2020). According to a 2015 survey by the Asian Development Bank, the average contribution of SMEs in the region was 42 per cent of national income or manufacturing value added. The figures may, however, be higher still when also accounting for informal SMEs. In terms of trade, the contribution of SMEs has been limited, and accounts for 35 per cent or less of the region's total export values (APEC, 2020). For instance, in 2018, SMEs in the Kyrgyz Republic produced 39 per cent of the country's direct exports (Karymshakov, 2020); the figure was 29 per cent in Thailand in 2018 (Korwatanasakul and Paweenawat, 2020); 25 per cent in the Philippines in 2016 (Mendoza, 2020); and 14 per cent in Indonesia in 2017 (Hing, Thangavelu and Narjoko, 2020).

An added complication is that there is no universal definition of SME, and definitions vary quite widely among Asian-Pacific economies, and even among business sectors in the same country. Common criteria are however based on employment, fixed assets or capital, and revenues. In

this chapter, following the SME criterion of Urata and Beak (2020), firms are separated into SMEs and non-SMEs, the former being defined as firms with fewer than 200 workers. In addition, firms can be categorised into GVC firms or non-GVC firms, based on their patterns of engagement in foreign trade. Again, following Urata and Beak (2020), this study defines GVC firms as firms engaging in imports of foreign inputs *and* direct and indirect exports of their products (Columns 5 and 6 of Table 1).

Based on the World Bank's Enterprise Surveys, Table 1 demonstrates different patterns of engagement in foreign trade of global firms. SMEs represent 86 per cent of the sample firms, which is somewhat consistent with the estimation of the World Bank (2020), namely 90 per cent of businesses. The SME share in GVC firms is as high as 67 per cent, yet the majority of SMEs (47 per cent) are concentrated in domestic procurement and sales (Column 1), while only 18 per cent of them participate in GVCs — equivalent to 15 per cent of the total sample. In contrast, most large enterprises (53.4 per cent of large enterprises) engage in GVCs.

Table 1. Patterns of Engagement in Foreign Trade of Global Firms by Firm Type

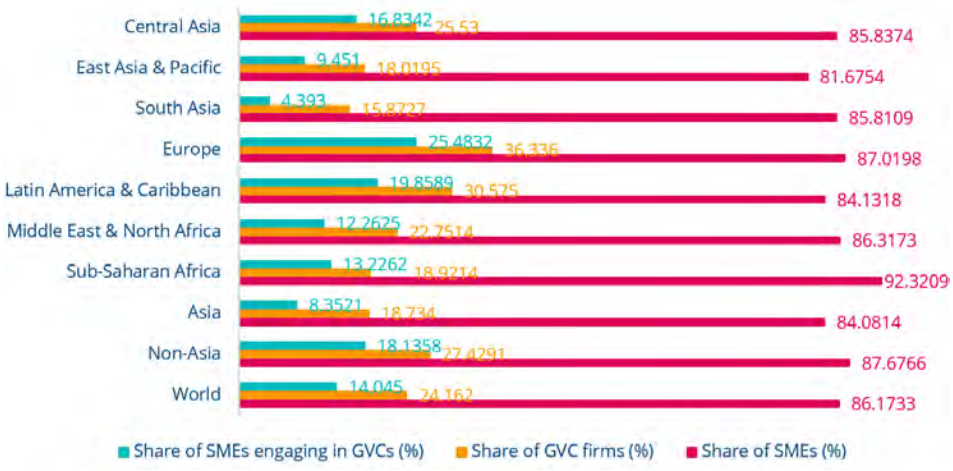
		1	2	3	4	5	6	GVC Firm (5+6)	Total
Sales	Domestic	Yes	Yes	No	Yes	No	Yes	Yes/No	
	Exports	No	No	Yes	Yes	Yes	Yes	Yes	
Inputs	Domestic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Imports	No	Yes	No	No	Yes	Yes	Yes	
Firm type	SME	18,131	10,634	653	2,569	681	6,254	6,935	38,922
	Non-SME	988	1,150	149	707	560	2,877	3,437	6,431
Total		19,119	11,784	802	3,276	1,241	9,131	10,372	45,353
% by sales and inputs pattern									
Firm type	SME	94.8	90.2	81.4	78.4	54.9	68.5	66.9	85.8
	Non-SME	5.2	9.8	18.6	21.6	45.1	31.5	33.1	14.2
Total		100	100	100	100	100	100	100	100
% by firm type									
Firm type	SME	46.6	27.3	1.7	6.6	1.7	16.1	17.8	100
	Non-SME	15.4	17.9	2.3	11.0	8.7	44.7	53.4	100
Total		42.2	26.0	1.8	7.2	2.7	20.1	22.9	100

Source: Author's calculation based on the World Bank's Enterprise Surveys.

GVC = global value chain; SME = small and medium-sized enterprises

SMEs account for the majority of firms in all regions with the average share of 86 per cent (Figure 1). Even though the share of SMEs differs across regions (Figure 1), it shows similar magnitude, ranging from 82 per cent in East Asia and the Pacific region to 92 per cent in Sub-Saharan Africa. This emphasises the fact that SMEs are one of the main economic drivers around the globe. In contrast, GVC firms represent a significantly smaller share than that of SMEs. The share of GVC firms also varies across regions but manifests greater variations. Europe has the largest share of GVC firms, accounting for 36 per cent, whereas the lowest share belongs to South Asia (16 per cent). Well-established regional value chains partly explain the relatively high share of GVC firms in regions such as Europe (36 per cent) and Latin America and the Caribbean (31 per cent). Despite the growing importance of 'Factory Asia', the share of GVC firms in Asia remains at a moderate level (19 per cent) — a situation which deserves serious attention from policymakers. A similar pattern is observed in the share of SMEs with GVC participation (hereafter GVC SMEs). However, the share of GVC SMEs in the Asia Pacific region is even lower, representing only 14 per cent, on average. The estimated statistics are in line with the prevalent notion of SMEs' limited involvement in foreign trade, and thus underscores the problem of SMEs' capability to join GVCs.

Figure 1. Shares of SMEs, GVC firms, and SMEs engaging in GVCs by region (% of total firms)

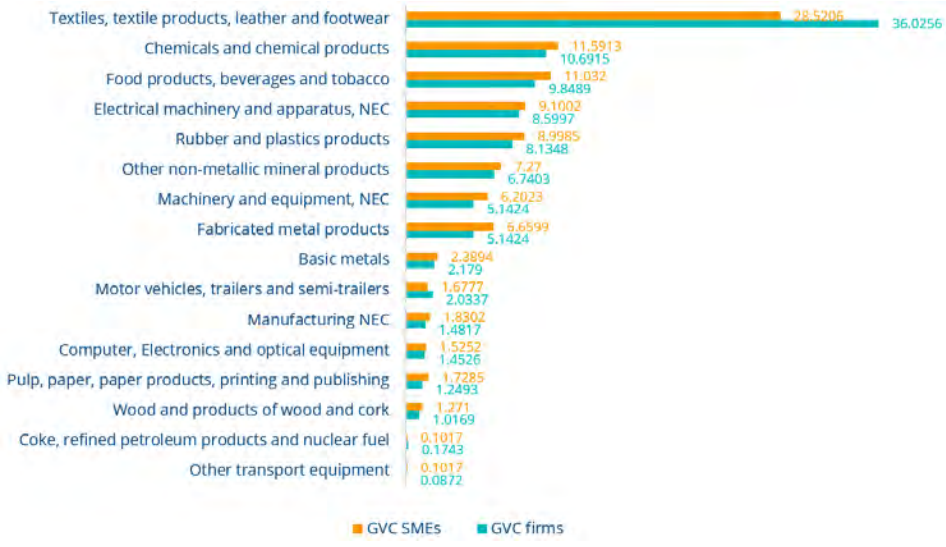


Source: Author's calculation based on the World Bank's Enterprise Surveys.

GVC = global value chain; SME = small and medium-sized enterprises

Most Asian-Pacific countries are labour-abundant and, thus, offer inexpensive labour costs. Their specialisation lies mainly in labour-intensive and low value-added production activities, such as production of raw materials, manufacture of parts and components, and product assembly. Through offshoring and internationally fragmented production, GVC firms are largely concentrated in relatively labour-intensive industries, such as the textiles and clothing industry, the food industry, and the electrical industry, amongst others, as can be seen in the World Bank's Enterprise Surveys (Figure 2). The largest share of Asian GVC firms (36 per cent) is in the textile and clothing industry, followed by the chemical industry (11 per cent), the food industry (10 per cent), and the electrical industry (9 per cent). The share of Asian GVC firms is however is significantly low in industries such as the electronics industry (2 per cent) and automobile industry (2 per cent). These industries are relatively capital-intensive and focus on high value-added activities. Limited technological capabilities and financial resources often prevent Asian GVC firms from entering the electronics and automobile value chains. The sectoral distribution of GVC SMEs is analogous to that of general GVC firms.

Figure 2. Sectoral Distribution of GVC Firms in the Asia-Pacific Region (%)



Source: Author's calculation based on the World Bank's Enterprise Surveys.

Note: GVC = global value chain; NEC = not elsewhere classified; SME = small and medium-sized enterprises

2.2 SMEs and Digitalisation

In the context of the ongoing industrial revolution, the importance of 'Industry 4.0', digital technologies for industrial and economic development is ceaselessly rising. This also has implications for GVCs. Previous studies have found that digitalisation positively affects SMEs' performances in both domestic (Abebe, 2014) and international markets (e.g. Clarke, 2008; Freund and Weinhold, 2004; WTO, 2016). SMEs with digital connectivity, e.g. Internet access, email, and website, have higher access to international trade and tend to engage in exports (Lendle and Olarreaga, 2014; UPS, 2017; WTO, 2016). The utilisation of digital technology greatly benefits SMEs in terms of cost reductions, which in turn permit SMEs to access international markets. Digitalisation helps reduce SME business costs along value chains, including market search, marketing, insurance and financing, regulatory compliance, distribution, and operational support (AMTC, 2018), while boosting SMEs' international competitiveness (Fernandes et al., 2017; ADB, 2015a; ITC 2016; Lendle and Olarreaga, 2014). In terms of market search and operational support, internet-based technologies enable SMEs to connect with foreign customers and suppliers and immerse themselves in value chains (Abel-Koch, 2016). Additionally, the use of information and communications technology (ICT) as part of a marketing plan raises business awareness and improves reputation in the global market. Digitalisation also offers greater opportunities for SMEs to access financial resources, particularly when financial institutes are not physically available or accessible. Regarding regulatory compliance, recent internet-and-ICT related regulation, rules, and laws in the foreign market pose new challenges to SMEs (ADB, 2015b; APEC, 2014). Without a sufficient level of digitalisation, SMEs find it difficult to enter GVCs. Lastly, digital technologies reduce costs related to distribution, and thereby induce greater GVC participation (Cusolito et al., 2016). Despite the importance of both SMEs and GVCs, only a handful of previous studies examined the impact of digitalisation on SME participation in GVCs.

Figure 3 provides illustrative evidence of the adoption rate of email by firm size across regions. In general, large firms have a higher email adoption rate than that of SMEs. The discrepancy of the adoption rates between SMEs and large firms is significantly large in the Middle East and North Africa, Sub-Saharan Africa, and East Asia and Pacific, ranging from 32 to 44 per cent. The discrepancy partly explains the current situation

where fewer SMEs are participating in GVCs, when compared with large firms. With limited digital connectivity, SMEs find that the costs of GVC participation are high, leading them to focus solely on the domestic market. In Asia, the email adoption rate is 95 per cent for large firms and 68 per cent for SMEs. Europe, Latin America and the Caribbean demonstrate the most intensive rate of email adoption for both SMEs and large firms. Only half of SMEs in the Middle East and North Africa, and sub-Saharan Africa use emails to communicate with clients and suppliers, implying low digital capability in these regions.

Figure 3. Adoption Rate of Email by Region and Firm Size

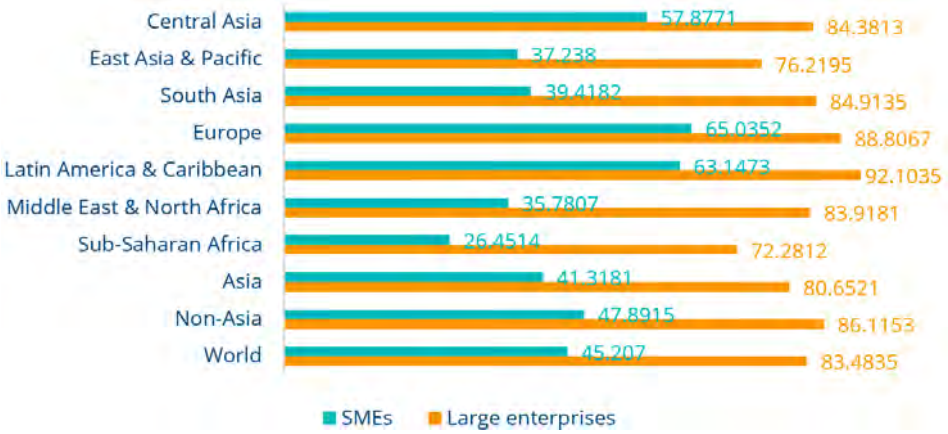
Source: Author's calculation based on the World Bank's Enterprise Surveys.

Note: SME = small and medium-sized enterprises

Overall, the website adoption rate is lower than the email adoption rate for both SMEs and large firms in all regions. Figure 4 reveals that SMEs employ a website markedly less than large firms do. SMEs' website adoption in Asia is low and accounts for 41 per cent, as opposed to 81 per cent of the rate for large enterprises. The gap between the website adoption rates of SMEs and large firms is very wide and more severe the divide between email adoption rates. This is because creating and maintaining a website require higher costs and IT literacy. The adoption rates of email and website therefore may roughly proxy for a basic level and a higher level of digitalisation, respectively. In conclusion, both Figures 3 and 4 point out the problems of the regional gap in digitalisation as well as the digital divide between SMEs and large firms within the same

region. These digital challenges for SMEs are possible factors which may undermine their participation in GVCs.

Figure 4. Adoption Rate of Website by Region and Firm Size



Source: Author's calculation based on the World Bank's Enterprise Surveys.

Note: SME = small and medium-sized enterprises

3. The Impact of Digitalisation on SME GVC participation

This section examines the impact of digitalisation on the level and probability of firms' participation in GVCs, particularly in the context of SMEs. The estimated results support the hypothesis that digital connectivity can facilitate firm participation in GVCs. Thus, the analysis of this section makes three significant contributions to the existing policy debates on digitalisation and GVCs. Firstly, as the effect of digitalisation on GVC participation is still largely unknown, analysis in this area aids in achieving greater understanding of the role of digital technologies in facilitating firms' participation in GVCs, especially that of SMEs. Secondly, the analysis is at the firm level and at a global scale, which is considered a rare opportunity for research in this field. GVC data is often unavailable at the firm level, even in advanced economies, and is therefore regarded as a critical technical issue in the study of GVCs. Utilising the unexplored firm-level data from the World Bank's Enterprise Surveys, this study is able to account for important heterogeneity in firm-level GVC participation and provides a detailed analysis on the digital readiness of Asian enterprises. Lastly, based on the research findings, relevant policy

implications are derived in order to help firms efficiently and effectively leverage the benefits of digitalisation and participation in GVCs.

The analysis is conducted at the firm level, utilising pooled cross-sectional data from the World Bank's Enterprise Surveys. The data covers 117 countries and 48,899 firms for the 2007-2019 period.[1] This study constructs two indicators of GVC participation, namely GVC participation dummy and GVC participation index. The GVC participation dummy indicates whether a firm joins GVCs based on their own patterns of direct and indirect engagement in foreign trade through sales and input procurement. Meanwhile, the GVC participation index is calculated by multiplying the ratio of exports to total sales and the ratio of foreign input to total input (Urata and Beak, 2020). Each indicator is used as an independent variable in two different regression analyses, including probit and tobit estimations.

A probit model estimates the probability that a firm with particular characteristics e.g. digital connectivity, firm size, types of ownership, etc. will fall into one of the two possible binary outcomes, i.e. GVC firm or non-GVC firm. In order to investigate the relationship between digitalisation and GVC participation, the following model was employed:

$$Pr\,(GVCparticipation_{ict} = 1 \mid Z_{ict}) = \theta(\beta_0 + \beta_1\, Digitalisation_{ict} + \beta_2\, X_{ict} + \gamma_c + \sigma_k + \mu_t + \epsilon_{ict})$$

Here, $GVC\ participation_{ict}$ indicates whether a firm is a GVC firm, while $Digitalisation_{ict}$ is proxied by the adoptions of email and website of firm *i* in country *c* and year *t*. X_{ict} represents a set of control variables: firm size, labour productivity, firm age, foreign ownership, government ownership, female ownership, internationally recognised quality certificate, and credit access. Robust standard errors were used, and the estimation model includes country-, industry- and time-fixed effects, represented by , , and respectively. ϵ_{it} is the disturbance term.

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1 *Non-Asia economies are included in the regression analysis since analysis with more observations provides a better estimation. The firm composition is as follows: Asia 42%, Europe 15%, Latin America and Caribbean 17%, Middle East and North Africa 9%, and Sub-Saharan Africa 18%. Therefore, the estimates of non-Asian firms are likely to be driven by certain regions and should be interpreted with caution. For the summary statistics, see Table A1 (Annex).*

Instead of predicting the probability of GVC participation, a tobit model estimates relationships between digitalisation and the GVC participation index, which ranges between zero and one. The estimation model is as follows:

$$GVCparticipation_{ict} = \beta_0 + \beta_1 Digitalisation_{ict} + \beta_2 X_{ict} + \gamma_c + \sigma_k + \mu_t + \epsilon_{ict}$$

Where *GVC participation*$_{ict}$ is the GVC participation index of firm *i* in country *c* and year *t*, whereas *Digitalisation*$_{ict}$ is again the adoptions of email and website. As previously mentioned, X_{ict} is the set of control variables and the rest represents country-, industry- and time-fixed effects, and the disturbance term respectively.

The estimated results of the probit model[2] demonstrate that being a smaller firm or an SME has a negative predicted impact on GVC participation. The results are consistent with previous studies, e.g. Arudchelvan and Wignaraja (2015), Korwatanasakul and Paweenawat (2020), and Vidavong, Thipphavong, and Suvannaphakdy (2017), which argued that it is difficult for SMEs to engage in GVCs due to their limited knowledge, technology, and innovation capacity. Furthermore, the results also reveal that firms with digital connectivity, such as the usages of email and website, are more likely to participate in GVCs. This confirms the views that the adoption of digital technologies allows firms to gain access to international markets (e.g. Lendle and Olarreaga, 2014; UPS, 2017; WTO, 2016) and that digitalisation help firms connect with domestic and foreign suppliers and consumers, and in turn enhances supply and value chains (Abel-Koch, 2016). The results also importantly highlight that the estimated positive effects of digital connectivity are larger for SMEs, as opposed to large firms. In other words, the adoption of either emails or a website raises the probability of GVC participation for SMEs to a greater extent than it does for a large firm.

The results from the tobit model[3] are largely consistent with the estimates of the probit model. The estimated impact of firm size on the GVC participation index is positive and statistically significant. In other words, being a smaller firm or an SME is associated with a lesser degree of GVC participation.

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2 *For the detailed result table, see Table A2 (Annex).*

3 *For the detailed result table, see Table A3 (Annex).*

The tobit estimation also demonstrates that digital connectivity generally positively affects the degree of GVC participation. Firms that employ digital technologies, such as email and website, tend to have higher accessibility to GVCs. The general impact of digitalisation loses its qualitative and quantitative significance in the case of large firms when incorporating the interaction effect between digital technology and the SME dummy variable. The utilisations of email and website have become a norm for large enterprises, which is supported by the high adoption rates of both technologies in the previous section (Figures 3 and 4). Thus, employing emails and websites in the business practice do not have much value added to large firms. Nevertheless, the strong effect of digital connectivity on GVC participation persists for SMEs. The utilisation of emails and website helps offset the negative impact of being SMEs, such as limited financial resources, deficient technological capability, and reliance on lower skilled human resources. This, again, emphasises the importance of digitalisation on GVC participation, particularly in the context of SMEs.

4. SME Digital Readiness Index and Policy Implications

This section examines the digital readiness of SMEs, and identifies the challenges they face. It also considers the policy measures which might help improve the current situation of SMEs with regard to digitalisation and GVC participation. The SME Digital Readiness Index assesses SME digital readiness based upon four domains, each with a number of factors that determine digital development, namely: labour capability, supporting infrastructure, digitalisation, and finance. Based upon the responses from the World Bank's Enterprise Surveys, the index is calculated by either 1) averaging the scores or statistics related to each factor, or 2) calculating a proportion of SMEs that have not experienced a particular problem, e.g. a proportion of SMEs in Asia that have not encountered power outages. Additionally, the index is computed for both Asian and non-Asian SMEs in order to contrast the level of digital readiness of Asian SMEs against that of the rest of the world.

Overall, Asian SMEs' digital readiness remains at an insufficient level, although this is also true of non-Asian SMEs, which are at a similar level (Figure 5). There is still large room for improvement with a distance to digital readiness frontier ranging from 32 to 66 points. The domains which are of great concern include finance (i.e. accessibility and availability of financial resources), supporting infrastructure (i.e. power stability and electricity-related obstacles to a firm's

operation), and labour capability (i.e. workers' education and availability of formal training programmes).

In terms of labour capability, Asian SMEs are nearly halfway to the optimal situation (100 points). Typical production workers average approximately nine years of schooling, while the average percentage of full-time workers which have completed secondary school is only 51 per cent, which is lower than that of non-Asian SMEs by 13 per cent. Moreover, formal training programmes are highly limited and show the lowest level of digital readiness (32 points) among all the factors. Only 32 SMEs out of 100 train their staff regularly. Low labour capability and insufficient training arguably prevent SMEs from fully utilising existing digital technologies, as well as from further developing their own digital innovations. This, in turn, raises the hurdle for SMEs to GVC participation and business upgrading.

Labour capability aside, both Asian and non-Asian SMEs' digital readiness is unsatisfactory in the domains of supporting infrastructure and finance. Less than half Asian SMEs reported that they did not experience power outages over the past fiscal year, whereas only one third reported that electricity is regarded as an obstacle to their firm's operations. Yet SMEs are very far from the frontier of digital readiness in terms of supporting infrastructure. Scores of Infrastructure I (Power stability) and Infrastructure II (Electricity) are 43 and 34 points respectively (for a maximum of 100). Basic infrastructure such as electricity is an important determinant of digital readiness. Without access to stable electricity, firms cannot operate efficiently and effectively, particularly when utilising digital technologies, such as email correspondence, telecommunications, and so forth.

In addition, the financial domain also poses a serious challenge to SMEs. In the case of Asian SMEs, 61 per cent have limited access to financial resources and services. Furthermore, only a handful of SMEs (33 per cent) possess an actual credit line or loan from a financial institution. Non-Asian SMEs face an even worse situation — their digital readiness results for Finance I (credit/loan) and Finance II (financial access) are 37 and 26 points respectively. The low scores in these two factors in the Finance domain support findings of previous studies in which the lack of financial resources is regarded as one of the most common barriers preventing SMEs from enjoying the benefits of digitalisation and GVCs (e.g., Hatsukano and Tanaka 2014; Korwatanasakul 2019; Korwatanasakul and Intarakumnerd 2020; Kotturu and Mahanty 2017; OECD 2007, 2008). Conversely, financial resources help SMEs expand their

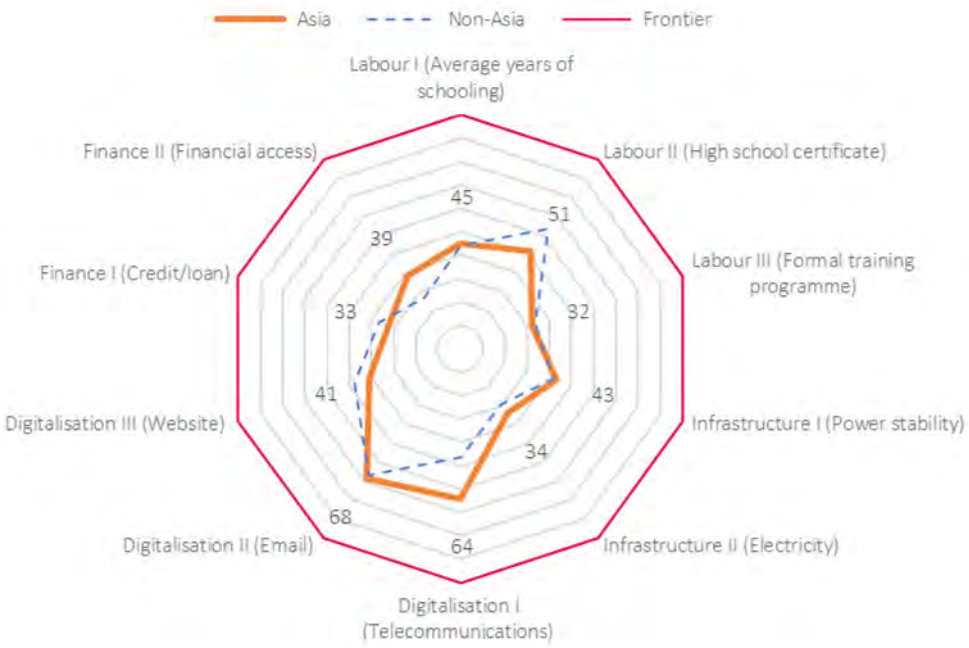
production and participate in GVCs by making use of digital technology and innovation.

Despite their average level of digitalisation, Asian SMEs' main strength lies in the factors of Digitalisation I (Telecommunications) and Digitalisation II (Email), where they score 64 and 68, respectively. These two factors are the closest to the digital readiness frontier among all the factors. Asian SMEs' adoption rates of telecommunications and email correspondence are also superior to those of non-Asian SMEs. At least two thirds of Asian SMEs use email to communicate with their clients or suppliers, while 64 per cent express that they did not experience obstacles with telecommunications in their daily operations. Relatively inexpensive and simple digital technologies such as email and telecommunications, inter alia, require only a modest financial budget and unsophisticated computer literacy. Therefore, it is possible that SME digitalisation may partially compensate — in terms of business operations and GVC participation — for the deficient levels of infrastructure and financial access. This is consistent with the estimated results presented in Section 3 where the relative impact of digital connectivity is greater for SMEs, as opposed to large firms. Nevertheless, when considering Digitalisation III (Website), the index shows a relatively low adoption rate (41 per cent of Asian SMEs). Since the creation and maintenance of a website requires more complex computer skills and/or higher costs, SMEs often have no other choice but to stay offline and rely mainly on cheaper and easier digital technologies, such as emails and telecommunications.

Based on the SME Digital Readiness Index, four policy measures were identified as key for the improvement of SME digitalisation and, thus, promotion of their GVC participation. These are: improving access to finance, promoting technological capacity, enhancing labour quality, and upgrading basic infrastructure. Rigorous policy responses to support SME capacity building in all these areas, particularly in terms of digital technology, should be regarded as a priority. A holistic approach is necessary to reduce digital barriers and promote the engagement of SMEs in GVCs. Policymakers need to ensure that SMEs have sufficient access to financial resources so that they can improve the basic digital infrastructure, such as the availability of electricity and the Internet environment without disruption, and so that they may further invest in more advanced digital technologies to reduce the digital divide between SMEs and large enterprises. Moreover, policymakers should consider incorporating IT-related courses into school curricula, while offering training programmes to improve the digital literacy of the current labour

force. Research and development and research collaborations between the public and private sectors are also important in order to upgrade SMEs' technology and digital capability.

Figure 5. SME Digital Readiness Index



Source: Author's calculation based on the World Bank's Enterprise Surveys.

Note: The numbers indicate the Digital Readiness Index of Asian SMEs.

SME = small and medium-sized enterprises

5. Conclusion

Participation in GVCs and the adoption of digital technology create multiple benefits to firms, particularly SMEs. These benefits include but are not limited to: capabilities and competitiveness enhancement, product quality improvement, financial stability, and market expansion. However, the statistics here analysed underscore the unbalanced GVC participation between SMEs and large enterprises, in which participation is biased towards the latter. The benefits of GVC participation are therefore unevenly distributed across firms, while the digital divide between SMEs and large enterprises, coupled with the

regional digital gap, further aggravate the observed inequality. The empirical evidence confirms the significance of digital connectivity for GVC participation, and the impacts of digitalisation are seen to be even stronger in the context of SMEs. Despite the benefits of digitalisation, Asian SMEs' digital readiness remains at an unsatisfactory level, far from the digital frontier. Policies that mutually address the problems of financial access, basic infrastructure, labour quality, and deficient digital innovation will help improve SME digital readiness, while enhancing their overall business capability to successfully enter GVCs.

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Annex

Table A1. Summary Statistics

Variable	Description	Observations	Mean	Standard deviation	Minimum value	Maximum value
GVC participation						
GVC participation	Dummy variable equal to unity if the establishment participates in GVCs. The GVC participation dummy indicates whether a firm joins GVCs based on firm's patterns of direct and indirect engagement in foreign trade through sales and input procurement.	48,899	0.2416	0.43	0	1
GVC participation index	The GVC participation index is calculated by multiplying the ratio of exports to total sales and the ratio of foreign input to total input.	48,881	0.0639	0.19	0	1
Digitalisation						
Email	Dummy variable equal to unity if the establishment uses email to communicate with clients or suppliers.	54,330	0.7380	0.44	0	1
Website	Dummy variable equal to unity if the establishment has its own website.	56,366	0.5050	0.5	0	1

Firm characteristics		15,295	0.8008	0.4	0	1
Firm size	Natural logarithm of a firm's total full-time employees.	56,322	3.5719	1.44	0	11.07
SME	Dummy variable equal to unity if the establishment has less than 200 employees.	56,326	0.8617	0.35	0	1
Labour productivity	Natural logarithm of labour productivity based on value added	49,973	13.6264	2.84	3.15	27.57
Firm age	Number of years in operation	55,838	20.5017	17	-1	340
Foreign ownership	The share of equity owned by foreign firm (%)	55,135	7.8642	24.9	0	100
Government ownership	The share of equity owned by government (%)	55,161	0.8155	7.16	0	100
Female ownership	The share of equity owned by women (%)	53,416	0.3259	0.47	0	1
Certificate	Ownership of internationally recognised quality certification	55,752	0.3002	0.46	0	1
Credit access	Dummy variable equal to unity if the establishment has a line of credit or loan from a financial institution.	54,531	0.3781	0.48	0	1

Source: Author.

Note: GVC = global value chain; SME = small and medium-sized enterprise

Table A2. The Effects of Digitalisation on GVC Participation (Probit Estimation)

	Dependent variable: GVC participation					
	Digitalisation: Email			Digitalisation: Website		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Digitalisation	0.428***	0.625***	0.186*	0.342***	0.480***	0.123**
	(0.0299)	(0.0288)	(0.106)	(0.0205)	(0.0199)	(0.0529)
Firm size	0.319***			0.316***		
	(0.00753)			(0.00734)		
SME		-0.712***	-1.162***		-0.694***	-1.023***
		(0.0239)	(0.107)		(0.0237)	(0.0506)
SME x			0.468***			0.404***
Digitalisation			(0.109)			(0.0554)
Labour productivity	0.0678***	0.0679***	0.0679***	0.0627***	0.0646***	0.0648***
	(0.00660)	(0.00654)	(0.00655)	(0.00616)	(0.00609)	(0.00610)
Firm age	0.00133**	0.00403***	0.00404***	0.00100*	0.00343***	0.00353***
	(0.000535)	(0.000518)	(0.000518)	(0.000515)	(0.000502)	(0.000501)
Foreign ownership	0.00816***	0.00934***	0.00934***	0.00822***	0.00952***	0.00937***
	(0.000346)	(0.000341)	(0.000340)	(0.000338)	(0.000332)	(0.000333)
Government ownership	-0.000283	0.00107	0.000959	-0.00172	-0.000317	-0.000346
	(0.00120)	(0.00118)	(0.00118)	(0.00104)	(0.00103)	(0.00102)
Female ownership	0.0841***	0.0735***	0.0724***	0.0771***	0.0655***	0.0666***
	(0.0189)	(0.0187)	(0.0186)	(0.0185)	(0.0182)	(0.0182)

Certificate	0.384***	0.529***	0.530***	0.358***	0.491***	0.492***
	(0.0209)	(0.0203)	(0.0203)	(0.0206)	(0.0201)	(0.0201)
Credit access	0.141***	0.216***	0.216***	0.143***	0.219***	0.218***
	(0.0189)	(0.0184)	(0.0184)	(0.0184)	(0.0180)	(0.0180)
Constant	-4.861***	-3.273***	-2.835***	-4.671***	-3.088***	-2.765***
	(0.349)	(0.354)	(0.368)	(0.345)	(0.350)	(0.354)
Observations	36,382	36,382	36,382	38,225	38,225	38,225

Source: Author.

*Note: ***, **, and * indicate that coefficients are significant at the one, five, and ten per cent levels respectively.*

Robust standard errors are reported in parentheses. All regressions include industry- country- and time-fixed effects.

SME = small and medium-sized enterprise

Table A3. The Effects of Digitalisation on GVC Index (Tobit Estimation)

	Dependent variable: GVC participation index					
	Digitalisation: Email			Digitalisation: Website		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Digitalisation	0.198***	0.276***	-0.00691	0.104***	0.160***	-0.0781***
	(0.0120)	(0.0121)	(0.0433)	(0.00778)	(0.00783)	(0.0188)
Firm size	0.110***			0.112***		
	(0.00269)			(0.00262)		
SME		-0.237***	-0.530***		-0.234***	-0.460***
		(0.00813)	(0.0445)		(0.00800)	(0.0189)
SME x			0.304***			0.276***
Digitalisation			(0.0447)			(0.0199)
Labour productivity	0.0120***	0.0120***	0.0120***	0.0116***	0.0125***	0.0124***
	(0.00238)	(0.00242)	(0.00242)	(0.00219)	(0.00223)	(0.00223)
Firm age	-0.000817***	0.000175	0.000176	-0.000933***	-4.02e-05	5.64e-05
	(0.000171)	(0.000167)	(0.000167)	(0.000159)	(0.000157)	(0.000155)
Foreign ownership	0.00327***	0.00380***	0.00380***	0.00318***	0.00378***	0.00367***
	(0.000114)	(0.000117)	(0.000117)	(0.000110)	(0.000113)	(0.000112)
Government ownership	-0.000122	0.000398	0.000330	-0.000873**	-0.000342	-0.000336
	(0.000394)	(0.000392)	(0.000394)	(0.000343)	(0.000342)	(0.000334)

Female ownership	0.0210***	0.0187***	0.0178***	0.0186***	0.0165***	0.0170***
	(0.00655)	(0.00665)	(0.00664)	(0.00627)	(0.00639)	(0.00636)
Certificate	0.108***	0.166***	0.166***	0.100***	0.156***	0.156***
	(0.00734)	(0.00735)	(0.00734)	(0.00718)	(0.00725)	(0.00719)
Credit access	0.0149**	0.0439***	0.0438***	0.0173***	0.0471***	0.0460***
	(0.00663)	(0.00666)	(0.00665)	(0.00638)	(0.00645)	(0.00642)
Constant	-1.598***	-1.095***	-0.809***	-1.539***	-1.029***	-0.804***
	(0.140)	(0.144)	(0.149)	(0.138)	(0.141)	(0.141)
Observations	36,381	36,381	36,381	38,224	38,224	38,224

Source: Author.

*Note: ***, **, and * indicate that coefficients are significant at the one, five, and ten per cent levels, respectively. Robust standard errors are reported in parentheses. All regressions include industry- country- and time-fixed effects.*

The highlighted cells indicate the estimated results that are different from the probit model.

SME = small and medium-sized enterprise

Trade Finance and Blockchain Usage in the Asia-Pacific

Saon RAY

Abstract

The Covid-19 pandemic has disrupted supply chains across the world. When the pandemic broke out, the disruptions were mainly due to the lockdowns imposed in various countries. The World Trade Organisation (WTO) has predicted that the pandemic might cause world trade to decline by 13 to 32 per cent in 2020. This paper will examine the implications of Covid-19 on digital trade, particularly the use of blockchain in the Asia Pacific region. The Asia Pacific (particularly Singapore and Hong Kong) is a leader in the use of digital technologies. This paper will thus attempt to draw out lessons from the first movers for the rest of Asia. It will examine the bottlenecks in the application of this technology in the Asia Pacific countries, and the need for regulatory changes in the Asia-Pacific. It will trace the technology's barriers to adoption, both as regards interoperability, and regulatory framework. The advantages of blockchain technology in trade finance are clear; it can promote trade efficiency, mitigate risk and expand trade to other regions. However, earlier efforts to introduce digital technologies have failed. More collaborative efforts are required, so that networks can connect seamlessly on a single technology platform, and meet the demand for trade finance. The Covid-19 pandemic seems to have provided an enabling environment for the intensification of digital efforts, increasing their urgency; should these measures indeed successfully occur, they will improve the resiliency of supply chains across the region.

Keywords: *trade finance, Blockchain, supply chains*

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1. Introduction

The impact of Covid-19 led to a trade collapse. The World Trade Organisation (WTO) estimated in April 2020 that world merchandise trade could fall by between 13 and 32 per cent in 2020 due to the Covid-19 pandemic. This paper will examine the implications of Covid-19 on digital trade, particularly the use of blockchain in the Asia Pacific region. The Asia Pacific (particularly Singapore and Hong Kong) is a leader in the use of digital technologies. This paper will thus attempt draw out lessons from the first movers for the rest of Asia. It will examine the bottlenecks in the application of this technology in the Asia Pacific countries, and the need for changes in regulation in the Asia-Pacific. It will trace the technology's barriers to adoption, both in terms of interoperability, and regulatory framework. The advantages of blockchain in trade finance are clear; it can promote trade efficiency, mitigate risk and expand trade to other regions. However, earlier efforts to introduce digital technologies have failed.

2. Use of blockchain in trade finance

a. Understanding blockchain technology

Distributed Ledger Technology (DLT)[1] is a novel way of sharing data across multiple data stores (or ledgers) (World Bank, 2017). The shared database enables peer-to-peer transactions without the need for a central authority. **Blockchain**, "is *a particular type of data structure used in some distributed ledgers which stores and transmits data in packages called 'blocks' that are connected to each other in a digital 'chain'. Blockchains employ cryptographic and algorithmic methods to record and synchronize data across a network in an immutable manner"* (World Bank, 2017).

Blockchain technology eliminates the need for intermediaries, while facilitating exchanges and transfers in real time, all within a tamper-proof record maintenance system. A single blockchain has all the necessary information in a single digital document, which is simultaneously accessible to all members of the network. With blockchain, multiple

1 *A distributed ledger is a digital ledger or a list, spreadsheet or database that is shared among nodes in a distributed network. The term is often used interchangeably with "blockchain". A blockchain is one type of distributed ledger (Ganne, 2018).*

copies of the same document no longer need to be stored on numerous databases across various participating transaction entities, and the approval process does not need to be sequential.[2] Since each participant on the network quickly updates the chain to reflect the latest transaction, it removes the need for multiple copies of the same document to be stored on numerous databases. Banks no longer need intermediaries to assume risk, and compliance officials can enforce anti-money laundering measures and customs activities without delay. Additionally, the use of smart contracts (self-executing digital contracts) to codify agreements could lead to new products for alternative financing, securitisation of trade obligations, and downstream factoring.[3] Smart contracts are computer programmes, and comprise one of the most immediate applications of blockchain technology, which could swiftly find its way into the financial services sector, including trade finance.

A smart contract can be conceptualised as "*a computerized transaction protocol that executes the terms of a contract. The general objectives are to satisfy common contractual conditions (such as payment terms, liens, confidentiality, and even enforcement), minimize exceptions both malicious and accidental, and minimize the need for trusted intermediaries*" (Cong and He, 2018).

Smart contracts can emulate regular contractual constructs and can be made partially or fully self-executing, self-enforcing, or both. This can potentially replace a number of mechanisms, such as, inter alia, standing instructions, and electronic clearing services (ECS).Catalini and Gans (2016) explain that a major attribute of blockchain technology is in its

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2 *Importers and exporters to banks, customs and logistics institutions, interact and collectively create a huge amount of data during the transaction, which varies by product. Letter-of-credit (LCs) are the most complex product, while the end-to-end process involves more than 20 players, and more than 100 pages across 10 to 20 documents, many of which are duplicated and transmitted multiple times. These interactions of two or more players produce about 5,000 data field interactions. Blockchain-enabled smart contracts are a possible solution since authorised trade parties can create and securely access data fields digitally. These contracts can automate shipment tracking, payment execution, and delivery verification (ICC, 2018).*

3 *Details of how blockchain works in trade finance can be found in 'How Blockchain can revitalise trade finance? (part 1)'. https://www.cognizant.com/whitepapers/how-blockchain-can-revitalize-trade-finance-part1-codex2766.pdf*

ability to lower transaction costs. Transaction costs in this context are the costs of agreeing to a contract, including measuring all the attributes relevant to the exchange of goods, services, or information, as well as the cost of enforcing a contract, including that of detecting infringement, policing and punishing. Blockchain technology allows all parties involved in a given transaction to verify its attributes without exposing the underlying information to a third party, or intermediary.

Using DLT to store financial details can prevent 'documentary fraud, facilitate the real-time approval of financial documents, unlock capital tied up in the process of waiting for clearance, reduce counter-party risk, and enable faster settlement.'[4] Documents on the distributed ledger allow all parties to conduct diligence for credit adjudication, check for anti-money laundering, and trace the location and ownership of goods. The technology is known for its characteristics, such as: decentralised networks; absolute digitisation; zero intermediaries; tamper-proof and unalterable record keeping; real-time exchange/transfer; reduced duplication; better data security; reduced settlement time; and reduced infrastructure costs relating to cross-border payments (Ray et al., 2019). There are, however, also disadvantages to this technology. Both advantages and disadvantages are detailed in the table, below. Governance and interoperability issues will be examined later.

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4 *Under cash-in-advance (CIA) terms, the exporter receives a payment before the ownership of the goods is transferred to the importer or even before the goods are shipped. Hence, the importer faces the risk of never receiving the pre-paid goods. Under open account (OA) terms, goods are shipped and delivered before a payment is made by the importer, so it is the exporter who bears the risk of never receiving a payment. The LC terms allow both parties to shift the risk on to a bank in exchange for a fee. Under an LC, the importer's bank commits to making the payment to the exporter upon the verification of the fulfilment of the terms and conditions stated in the LC, so the exporter is sure that a payment will be received, while the importer does not need to make a payment prior to the goods' arrival.* https://2016.export.gov/tradefinanceguide/eg_main_043221.asp

Table 1: Advantages and Disadvantages of Blockchain

	Advantages	Disadvantages
Reduced complexity	✓	
Real time review	✓	
Disintermediation	✓	
Reduced counter party risk	✓	
Decentralised contract execution	✓	
High energy consumption		✓
Governance		✓
Interoperability		✓
Splitting of the chain/ other threats		✓

Source: Compiled from various sources by author

b. Use of blockchain in trade finance

Trade finance is the set of tools that banks and other financial institutions use to extend credit and other forms of lending to individuals and businesses so that they may engage in the international exchange of goods and services.[5] Approximately, 18 trillion USD of annual trade involves some form of finance, whether credit, insurance or guarantee. Up to 80 per cent of trade is supported by some form of financing (WTO, 2016), includes traditional mechanisms, such as letters of credit (LC), as well as supply chain finance. Only a small part of international trade transactions is paid by means of cash-in-advance, as buyers usually want to pay only once the goods have been delivered.

Financial institutions bridge the gap between exporters, who need guarantees of payment before they can ship, and importers, who require

5 *Ciccaglione, Bryce, "Utilizing Blockchain Trade Finance to Promote Financial Inclusion" (2019). Honors Scholar Theses. 619. https://opencommons.uconn.edu/srhonors_theses/619*

data on whether goods have been delivered. Exporters use invoices to secure short-term financing from multiple banks, which increases the consequences should the delivery fail. Parties use different platforms, raising the odds of miscommunication, fraud, and version compatibility challenges. Multiple checkpoints delay payment, and slow the shipment of goods. Additionally, trade finance is particularly affected by increased compliance requirements and de-risking. [6] The size of the trade finance market exceeds 10 trillion USD per year. The International Chamber of Commerce (ICC) estimates that the global trade financing gap is of around 1.6 trillion USD.

International trade requires many documents to be verified and cleared. Documents such as bills of lading (BL) and LCs need to be generated, which causes delays.[7] Digitalisation of trade documents and automating trade finance can therefore reduce transaction times considerably. The use of blockchain and distributed ledger technology is a particularly effective shift (Ganne, 2018).

Trade costs can be separated into three categories: transportation, regulatory, and information (Allen et al., 2019). Shipping containers have driven down transportation costs, thus, as Anderson and Van Wincoop (2004) observe, the costs of bringing goods across borders now exceed transportation costs. The major type of costs facing supply chains today are in fact not transportation or regulatory in nature, but costs of information. These include the costs of enforcing contracts, searching for trading partners, and acquiring information about the nature, characteristics, and provenance of goods as they move along supply chains. Information costs increase with the complexity, length, and volume of trade on supply chains. Also, as transportation and regulatory costs fall, the relative importance of information costs rises. Blockchain technology can, however, reduce or eliminate some of these costs.

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6 *Local banks need international correspondent banks to confirm their LCs, engage with them in supply chain finance, and clear trade-related payments in foreign currency (Demir and Javorcik, 2020).*

7 *According to the ICC, the average credit process requires a great deal of paper documentation, including 36 original documents and 240 copies, which is estimated at 4 billion pages of documents each year. https://www.techinasia.com/latest-tech-developments-trade-finance-industry-whats*

Respondents to the 2016 ICC's Global Survey on Trade Finance identified anti-money laundering (AML) and Know Your Customer (KYC) requirements as the largest impediment to trade finance (ICC, 2018). The industry relies on paper documents and manual labour, which leads to shipping and payment delays, as well as high transaction costs. Due to such inefficiencies, access to trade finance has never been easy for small businesses that lack the resources to comply with the requirements laid out by banks and other financial institutions.

The LC is used as a documentary proof of trust, and this payment modality is trusted by exporters due to lower levels of risk, since payment is only made once the terms and conditions are met (Chang et al., 2019). The LC process in a typical international trade transaction involves sellers (exporters), buyers (importers), shippers (logistics carriers) and banks. The transactions between them involve flows of documents, cash and actual goods (logistics). The process of exporting (or importing) includes the following steps: [8]

1. A contract of sale is drawn up between the seller and the buyer (document);
2. The buyer asks their bank to issue an LC to the seller's bank (document);
3. The LC advises the seller to check the received LC for the exchange of goods;
4. The seller arranges shipment to the buyer (logistics);
5. The shipper provides shipping documents, such as a BL, to the seller;
6. The documents are forwarded to the seller's bank, and then to the buyer's bank (document);
7. The buyer then pays their bank in exchange for the BL;
8. The BL is then presented to the shipper to claim the goods when they are delivered (cash).

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8 This process is illustrated in Chang et al. (2019). The steps are outlined in the process and the type of transaction (documents, cash or goods) are indicated in parentheses.

If deployed, Blockchain technology could change the process by reducing the time considerably (not the number of steps per se), as illustrated by Deloitte, (n.d.):

1. The agreement between the buyer and seller is shared with the buyer's bank using a Smart Contract on the Blockchain;
2. The buyer's bank reviews the purchase agreement in real-time, and drafts the LC and submits the obligation to pay to the seller's bank;
3. The seller's bank reviews the payment obligation, and once it has been approved, a Smart Contract is generated on the Blockchain to cover terms and conditions, and to lock-in obligations;
4. The seller, on receiving the obligations, will sign the blockchain equivalent LC within the Smart Contract to initiate the shipment;
5. Goods will be inspected by 3rd parties, and by the customs agents in the exporting country, and the digital signature will be made on approval in the Blockchain Smart Contract;
6. The goods will be transported from the seller's country to the buyer's country;
7. Upon delivery, the buyer will digitally acknowledge receipt of goods and trigger payment;
8. The Blockchain will automate payment from the buyer to the seller via the Smart Contract.

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) has announced an initiative exploring the use of blockchain in trade finance. Seven major European banks (KBC, Deutsche Bank, HSBC, Natixis, Rabobank, Société Générale and UniCredit) are partnering on a new blockchain-based permissioned trade finance platform, Digital Trade Chain (DTC), to manage open account trade transactions for both domestic and international commerce, from initiation to settlement. The DTC allows authorised parties to track the progression of those transactions (EM Compass, 2017).

3. Implications of Covid-19 on digital trade with reference to the Asia-Pacific

Demir and Javorcik (2020) examine the composition of export flows through the lens of financing using data from Turkey.[9] They provide evidence consistent with the view that increased risks of non-payment and non-delivery have negatively affected trade flows during the pandemic.[10] They find that flows using bank intermediation, which eliminates or reduces the risk of non-payment or non-arrival of prepaid goods, such as LCs or documentary collection, appear to have been much more resilient to the downturn relative to flows using other financing terms. The most stringent specification shows no decline in flows backed by LCs or documentary collection relative to the historical average. At the same time, the data indicate a 42 per cent drop in cash-in-advance flows, where the importer risks that prepaid goods will not be delivered, and a 27 per cent decline in open-account flows where the exporter takes on the risk of not receiving a payment.

Estimates of how much cross-border paperless trade can increase exports suggest that they may increase by between 36 billion USD and 257 billion USD, annually (UNESCAP, 2018). For the Asia Pacific Economic Cooperation (APEC) region, implementation of Single Window System (SWS) and related initiatives has reduced export costs and time in recent years (APEC, 2018). Trade simplification, such as paperless trade, can assist in the reduction of information costs; this can be observed in the study of several individual-country cases, such as Japan, the Republic of Korea, Singapore, and Thailand (APEC, 2011; Duval et al., 2015). A World Economic Forum (WEF) study suggests that blockchain usage could result in over 1 trillion USD of new global trade over the next decade (WEF, 2018).

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9 *Turkey collects very detailed data on payment terms in international trade transactions, which allows for the study of different types of financing terms for exports in the first 3 months of 2020, relative to the historical average.*

10 *In the aftermath of the 2008–9 financial crisis, 200,000 correspondent banking relationships disappeared. Africa, the Caribbean, Central and Eastern Europe, and the Pacific Islands were the regions most affected by the termination of these correspondent banking relationships. Heightened perception of the regulatory risk of operating in developing countries was felt due to the adoption of new AML measures, countering the financing of terrorism regulations, and other regulations involving sanctions. Local banks in developing countries have faced greater demand from foreign jurisdictions in terms of complying with regulations (Demir and Javorcik, 2020).*

Turning to the specific uses of blockchain in the Asia Pacific region, the Hong Kong Monetary Authority (HKMA) and the Monetary Authority of Singapore (MAS) are together developing the blockchain-based Global Trade Connectivity Network (GTCN), with the aim of creating a cross-border blockchain infrastructure. Existing domestic platforms will be able to feed into the GTCN, with the goal of rendering trade finance cheaper, safer and more efficient. Initially, the network shall include only Hong Kong and Singapore, however the potential to expand to include other countries exists.[11] Meanwhile, eTradeConnect, a digital trade finance platform that uses DLT, was developed by a consortium of 12 major banks in Hong Kong.[12] This platform hopes to "build trust among trade participants, reduce risks, and facilitate trading counterparties to obtain financing by digitising trade documents, automating trade finance processes and leveraging the features of blockchain technology."

Standard Chartered is leading the DLT Trade Finance Working Group (formed under the Hong Kong Monetary Authority's Fintech Facilitation Office) to deliver a proof of concept, developed in collaboration with the Bank of China, Bank of East Asia, Hang Seng Bank, HSBC, and Deloitte Touche Tohmatsu. In another pilot, HSBC joined forces with Bank of America Merrill Lynch and the Infocomm Development Authority of Singapore (IDA) to develop a prototype solution built on blockchain for LCs in smart contracts.[13] The consortium used the Linux Foundation open-source Hyperledger Project Fabric (whose development was supported by IBM).[14] In the United Arab Emirates, Infosys

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11 *https://asianbankingandfinance.net/trade-finance/commentary/harnessing-technology-optimise-asian-trade*

12 *The banks include Australia and New Zealand Banking Group Limited, Bank of China (Hong Kong) Limited, The Bank of East Asia Limited, DBS Bank (Hong Kong) Limited, Hang Seng Bank Limited, The Hongkong and Shanghai Banking Corporation Limited and Standard Chartered Bank (Hong Kong) Limited, Agricultural Bank of China Limited, Bank of Communications Co Ltd, BNP Paribas, Industrial and Commercial Bank of China (Asia) Ltd and Shanghai Commercial Bank Ltd. https://www.etradeconnect.net/Portal/NewsDetail?id=2*

13 *Banks join already created blockchain platforms since their role is that of financial guarantor and payment operator in trade finance. Their objective is not to create and maintain technological solutions (Bogucharskov et al., 2018).*

14 *Hyperledger Fabric is the modular blockchain framework that has become the de facto standard for enterprise blockchain platforms (https://www.ibm.com/blockchain/hyperledger)*

partnered with Emirates NBD and ICICI to deliver the first blockchain-based trade finance (and remittances) solution in the region.[15]

Another technological innovation is Contour, which was designed as a trade finance prototype that aims to digitalise LCs by using blockchain technology.[16] While the original paper-based process required several days' waiting time, with Contour it takes less than 24 hours. Contour conducted trials in 14 different countries, in partnership with over 50 banks and corporations.[17],[18] It has been used in a transaction involving BNP Paribas and HSBC Singapore between Rio Tinto and Cargill.[19],[20] Singapore's Networked Trade Platform (NTP),[21] was launched in 2018 as a multibank trade information management

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15 *The pilot was conducted in 2016 (https://www.infosys.com/newsroom/press-releases/2016/launch-blockchain-pilot-network.html)*

16 *This is known as Voltron, digitalises trade finance documents, and operates on R3's blockchain-based Corda network. R3 is an enterprise software firm that is pioneering digital industry transformation. (https://www.r3.com/about/). Corda is supported by R3 and is a private permissioned blockchain platform that enables businesses to transact directly and in strict privacy with one another using smart contracts (https://www.r3.com/corda-enterprise/).*

17 *Ganne (2018)*

18 *Other examples can be found in 'Rebooting a Digital Solution to Trade Finance' (https://www.bain.com/insights/rebooting-a-digital-solution-to-trade-finance/) and from China (https://www.ledgerinsights.com/china-forfaiting-trade-finance-blockchain/*

https://cfo.economictimes.indiatimes.com/news/7-out-of-10-companies-in-apac-are-at-risk-of-being-left-behind-due-to-lack-of-digital-strategy-and-execution/71581492)

19 *BNP Paribas and HSBC Singapore completed Singapore's first fully digitalised end-to-end LC transaction between Rio Tinto selling a bulk shipment of iron ore originating from Australia to China for its customer Cargill with a seamless end-to-end transfer of an electronic bill of lading (eBL) over traded goods using a digital LC. As part of the transaction, BNP Paribas issued a LC over the blockchain on behalf of Cargill to HSBC Singapore acting on behalf of Rio Tinto.*

https://www.commercialpaymentsinternational.com/news/first-fully-digitised-trade-transaction-completed-in-singapore/

20 *https://insight.factset.com/five-economic-charts-to-watch-asia-pacific-covid-19-edition*

21 *In theory, it streamlines paper-based trade financing processes by consolidating them in a single ecosystem.*

https://www.ntp.gov.sg/public/introduction-to-ntp---overview

platform. Through the NTP, companies will be able to access all necessary trade information, as well as connect with parties up and down the supply chain. Digitalised documentation may also be housed on the platform, and quickly shared with business partners, financial institutions, and regulators.

4. Bottlenecks in the application of blockchain to trade finance

As the Covid-19 pandemic hit, world trade fell steeply in the first half of 2020. Trade in a world of global value chains, has been disproportionately affected and has seen a decline. The decline in world trade was of 2.7 per cent in the first quarter, and 12.5 per cent in the second quarter of 2020.[22] However, it rebounded in June, for all countries except Japan. The WTO has said that the worst case scenario (32 per cent projected decline in world trade) has been avoided.[23] East Asia and the Pacific regions appear to have fared better than other regions, (based on data from the first quarter of 2020 and April 2020). Trade declines for South Asia have, however, been particularly steep.

Increased uncertainty due to the pandemic may have another negative impact on trade costs,[24] in the form of trade finance contraction. While trade finance has not received as much attention during the crisis, the economic downturn is starting to take its toll. Some argue that emerging and developing economies are already seeing their sources of finance dry out disproportionately due to rising risk aversion amongst lenders, and cash flow challenges for companies arising from the overall collapse in the demand and supply of goods.[25]

Banks are finding it difficult to reduce entry barriers, such as the high costs of complying with increasingly complex sanctions and regulatory, KYC and AML

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22 *https://www.cpb.nl/en/worldtrademonitor*

23 *https://www.weforum.org/agenda/2020/07/coronavirus-global-trade-impact-recovery-pandemic-wto/*

24 *Latest data from the ESCAP-World Bank Trade Cost Database show that the overall cost of trading goods among the three largest EU economies is equivalent to a 42 per cent average tariff on the value of goods traded; the People's Republic of China (PRC), Japan, and the Republic of Korea have costs which are a 55 per cent tariff equivalent; trading costs among ASEAN members reaches 76 per cent; the South Asian Association for Regional Cooperation (SAARC) is at 121 per cent; and the Pacific Island developing economies, at 133 percent;.*

25 *Financial Times, April 28 2020, "Trade finance hit as goods stack up".*

requirements.[26] This is a particular issue in emerging markets, where a lack of historical data presents a challenge in meeting KYC requirements. At the same time, the situation is exacerbated by a lack of correspondent banking relationships, and by the exit of larger global banks from certain countries due to the perceived risk of doing business there. While the market is aware of the opportunities, and of the current unmet demand for financing — particularly with emerging markets and small- and medium-sized enterprises (SMEs) [27] — the challenge in resolving this situation remains. These uncertainties have contributed to the rise of non-bank financial services and platforms.[28]

Allen et al., (2019) examine the potential of blockchain technology to lower trade information costs. These are the costs of coordinating trusted information about the characteristics of goods for consumers, producers, and governments. When goods move, information about their provenance, ownership, and quality must also move with them. Blockchain technology can reduce information costs by acting as a new economic infrastructure. Policy and regulatory challenges will, however, still need to be dealt with.

The main hurdles include differing standards for trade finance technologies,[29] and poorly defined regulations with regard to their usage. There are two view on standards: a) countries should allow the industry to develop before setting the standards so that the industry does not get locked into inferior technological options; or, b) countries should proactively set standards by benchmarking these against other countries' best practices.

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26 *https://www.tradefinanceglobal.com/supply-chain-finance/asias-digital-trade-landscape-2020/#4*

27 *The findings of the 2019 Global survey by BNY Mellon are: i) Compliance constraints were reaffirmed as the primary contributor to trade finance rejections; ii) Technology and regulatory revision are priority solutions; iii) Enhanced transparency and efficiency are needed to help drive more trade finance to markets with high levels of unmet demand; and iv) Risk-sharing partnerships with global banks ranked top for creating additional financing capacity. Link:*

https://www.smefinanceforum.org/post/2019-global-survey-overcoming-the-trade-finance-gap-root-causes-and-remedies#:~:text=BNY%20Mellon%20released%20its%20%22Overcoming,participants%20responding%20to%20its%20survey.

28 *https://asianbankingandfinance.net/trade-finance/commentary/harnessing-technology-optimise-asian-trade*

29 *https://www.techinasia.com/latest-tech-developments-trade-finance-industry-whats*

The International Organisation for Standardisation (IOSCO) has formed a technical committee (ISO/TC 307) for international standardisation of Blockchain and DLTs.[30] The committee has six working groups which will look into issues of terminology, reference architecture, taxonomy and ontology, use cases, security and privacy, identity and smart contracts. IOSCO had given recommendations to consider while the Senior Supervisors' Group (SSG) issued principles for supervisors to consider when assessing practices and established key controls over algorithmic trading activities at banks (FSB, 2017).

The other barriers include high entry barriers that discourage small firms from considering the technology. What is needed is an interoperable framework, in which all the stakeholders in the ecosystem are able to share experiences. The requirement from the firms' viewpoint (lack of familiarity with the technology) is different from that of banks (more active participation in the digitalisation process), which is again different from that of the regulator (more collaboration between banks and other players in the ecosystem). The Bank of International Settlements (BIS) (2014) says that there is need to create an ecosystem which allows for a seamless implementation of trade finance.

The Asia-Pacific Trade Facilitation Report 2019, points out the challenges of digitalisation, including the high cost of adopting technologies, and the lack of international rules and standards covering digital trade. Blockchain technology is not free of risks related to incorrect information input, cyber security, and operational risk. UNESCAP and ADB (2019) suggests three initiatives can enable more widespread technology adoption; these include, i) the Digital Standards for Trade Initiative, which aims to develop trade ecosystem standards; ii) the Global Legal Entity Identifier system, which aims to issue unique identifiers for both large and small firms at low cost, enhancing transparency; iii) and model laws on electronic transferable records, electronic commerce, and e-signatures under a UN system to help countries implement legislation in a concerted fashion towards digital trade (UNESCAP and ADB, 2019).[31]

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30 https://www.iso.org/committee/6266604.html

31 *The possibility of dialogue between the G20 countries on bridging the regulatory differences could be explored (OECD, 2020a).*

5. Need for regulation

The WEF (2018) concluded that there are "far more significant impediments to trade than tariffs." They found that reducing supply chain barriers to trade (not including tariffs) could increase global GDP by nearly 5 per cent, and global trade by 15 per cent. Several policy implications emerge from these findings. Developing countries and emerging economies, which are perceived as risky trading partners, may not be able to import unless they are able to guarantee payments. Over the period 2014 to 2019, the average Digital Services Trade Restrictiveness Index (DSTRI) shows that trade restrictiveness increased by 11 per cent across all countries, due to a tightening of measures in infrastructure connectivity, interoperability of regulations related to cross-border data flows, as well as online payment services, and localisation requirements (OECD, 2020b).

The WTO (2020) notes that there are three main sources of trade costs that have the potential to make a significant impact on international trade during the pandemic. These are transport costs, travel costs,[32] and higher levels of uncertainty. Government policy choices will play an important role in shaping and mitigating uncertainty-related trade costs. The extent to which government responses to the pandemic increase or reduce trade policy uncertainty, will, in turn, increase, or reduce, trade costs in the future. Pricier air freight transport and less travel would impact the trade of both goods and services. The transition to electronic interactions may lessen some of the impact, but this will vary across economies according to their internet and communications technology (ICT) infrastructure and digital skills.[33]

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32 *Transport and travel are important determinants of overall trade costs and have been significantly affected by the pandemic. Trade policy is also an important determinant of trade costs. Many of the changes in trade costs can be expected to revert once the pandemic is over, though some may persist because of shifts in the policy environment or market dynamics. Another area where higher costs may persist is travel and air transport either due to selective travel restrictions by governments until Covid-19 has been eliminated globally, or because prices increase in the long-term after a process of airline bankruptcies, industry consolidation, and lower competition. There could also be a more permanent shift in how people perceive the risk of flying, which would imply a higher perceived cost of travel.*

33 *There will be some that are left behind: https://cfo.economictimes.indiatimes.com/news/7-out-of-10-companies-in-apac-are-at-risk-of-being-left-behind-due-to-lack-of-digital-strategy-and-execution/71581492*

Atkinson (2020) notes that governments of developing countries face technical barriers, information asymmetries, and make less use of ICT solutions. At present, the application of existing and envisaged rules is not able to meet the technical needs of the digitally enabled economy. The internet is a powerful enabler of trade, but for its full potential to be explored there is need for rules regarding cross-border transactions. A "rules as data" approach can help to overcome limitations.[34] National Trade Facilitation Committees must seek to create a better environment for trade by updating the domestic policy and technology interface with international markets. More international and inter-institutional cooperation is urgently needed to address the shortage of trade finance, particularly in the face of the sharp economic downturn caused by the current pandemic.

Blockchain-based platform-generated LCs have many advantages over traditional processes, including process efficiency, risk mitigation, managing working capital, and supply chain management. Key barriers such as KYC and AML issues can also be addressed and information can be securely shared (Parra-Moyano and Ross, 2017). However, some barriers still remain – these can be categorised as legal, security-related, and regulatory in nature (WEF, 2018). Implementation costs are also significant, and in a cross-border context, since data protection laws vary across countries, this creates additional complications. Complications arise particularly since parts of shared data require confidentiality (ADB, 2019).

Another issue arises due to inaccurate data and errors in the code, which then get reflected across the entire network. The main regulatory challenge for the application of Blockchain technology lies in its complex nature. Earlier efforts at regulation have also suffered from a lack of uniformity in terminology. Achieving an accepted international terminology and standard is key to further and widespread implementation of the technology (UNESCAP and ADB, 2019).

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34 Governments and other stakeholders are increasingly using a range of approaches to ensure that data can flow across borders with trust. These approaches can be placed in 3 broad categories 1. Data flow policies focused on the transfer of personal data and discussed in plurilateral arrangements (e.g. the OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data) 2. Cross-border data flows are also being discussed and addressed in trade agreements 3. in private-led or technology driven initiatives e.g. ISO standards or sandboxes (OECD, 2020a).

Efforts are also needed within multilateral fora, such as the WTO, and the Group of Twenty (G20). The WTO, the World Bank and other multilateral development banks (MDBs) have been working to boost trade finance for developing countries since 2005. In 2009, the G20 agreed to greater risk-sharing between banks and international and national institutions, and in its 2016 Shanghai statement, the importance of trade finance was underlined (UNESCAP and ADB, 2019). There have been further efforts in this direction with discussions at the G20, especially during the German presidency, which explored 'Digitalisation' in detail (though not specifically for trade finance) (Ray et al., 2018).

6. Way ahead

Assuming that the worst of the Covid-19 crisis is over, Asia-Pacific economies, led by China, are poised to begin an economic recovery sometime in the third quarter of 2020, although risks of downturn certainly still remain. BIS (2014) observes that from a policy perspective, two issues stand out as particularly desirable: (i) measures aimed at increasing the stability and resilience of trade finance markets (to reduce shocks and limit the potential for negative spillovers through trade finance channels); (ii) and, monitoring developments in trade finance markets to make informed policy decisions. This is even more relevant in the current context of the pandemic.

The availability of trade finance in emerging markets has been steadily declining in the past decade (WTO, 2020). The Covid-19 crisis has amplified profound fault lines in the functioning of global value chains (GVCs) and exposed the fragility of a model characterised by high interdependencies between leading firms and suppliers located across several continents. The health crisis means that the timely production of critical products is more important than ever, yet in view of that very crisis, governments have locked down vast parts of the planet and disrupted economic activities in an unprecedented way.

Blockchain technology will only reach its full potential if all aspects of cross-border trade transactions are digitalised, from trade finance, to customs, to transportation, to logistics, and if the semantics are aligned (i.e. what specific information is communicated by the data elements). The transportation and logistics sector, which can readily use blockchain implementation, is actively looking into ways to leverage the technology in order to develop trade platforms that could connect all actors along the supply chain, including banks

and customs authorities. If the projects that are under development succeed, blockchain technology could well become the future of trade infrastructure, and the biggest disruptor to the shipping industry and to international trade since the invention of the container. However, such projects require complex integration work, and a conducive regulatory environment, interoperability and standardisation. Lessons can be drawn from the proof of concepts and use cases that have been applied using blockchain technology to trade finance in the Asia-Pacific region. More collaborative efforts are required, so that networks can connect seamlessly on a single technology platform, and meet the demand for trade finance. Hence, a dialogue between all stakeholders and regulators is essential.[35] The pandemic may have provided an environment which increases the urgency of such efforts, and may therefore have the positive effect of improving the resiliency of supply chains across the region.

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4

The Uneasy Relationship Between Labour and Digital Trade

Rogelio Alicor L. PANAO

Abstract

Does the size of a country's industrial sector constrain digital trade?

Although there is growing recognition of the importance of data flows in enabling global value chains, little is known about digital trade and its implications on the domestic economy. It is widely assumed that digital trade — similar to investment — is determined by the extent to which economies are willing to liberalise markets, as well as by the degree to which institutions facilitate the ease of transactions. However, incipient patterns based on new indicators seem to contradict this view. For instance, the Digital Trade Restrictiveness Index suggests that both China and India — despite having polarised regime structures — are both amongst the most trade-restrictive.

This paper argues that a country's openness or restrictiveness to digital trade is correlated with the size of its industrial sector, as opposed to conventional determinants, such as the overall size of its economy, and its political system. Examining cross-sectional fiscal, labour, and trade data in 64 economies, the study finds that countries with a relatively large industrial labour sector as compared to their service sector appear to impose stricter regulations on digital trade and network-based services.

The findings nuance current understandings of the impact of digital trade, especially as relates to emerging economies. It may be that labour markets respond less swiftly to globalisation, and that restrictive policies on digital trade are largely protracted measures intended to protect a vulnerable industrial sector, likely to suffer in the globalisation process. Consequently, policies purportedly seeking to promote digital trade must take into account its repercussions on workers, and weigh whether a digital shift is worth the attendant economic dislocations.

Keywords: *digital trade, globalisation, industrial sector, services sector, trade restrictiveness*

Technology has always been the driver of international trade. In recent years the global flow of goods has become more dynamic and ubiquitous as mobile and internet technology reinvent business processes and supply chains. While it took Marco Polo and his brother years to traverse the proverbial Silk Road, nowadays governments, businesses, and even individual merchants can trade in vast quantities with a click, or a call. However, while digitalisation engenders opportunities for products and processes, it also threatens to change labour market arrangements as we know them (Buttner and Muller 2018; Chinorackya and Corejova 2019). Digital trade, in particular, has altered conventional notions of product and service suppliers, and has rendered many traditional industries obsolete. In response, many emerging and developing economies have adopted interventionist digital policies with the goal of protecting fledgling industries from overseas competition (Drake, Cerf, and Kleinwachter 2016; Foster and Azmeh 2020).

Why is the fate of the industrial sector intertwined with that of digital trade? What have industries got to do with regulatory policies on digital commodities? Does the size of the country's industrial labour sector constrain digital trade?

It is widely assumed that digital trade — similar to investment — is determined by the extent to which economies are willing to liberalise markets, as well as by the degree to which institutions facilitate the ease of transactions. Supposedly, low income democracies are likely to impose tariffs to compensate for, inter alia, the difficulty in collecting taxes (Moutos 2003). Corruption, on the other hand, is found to have a negative impact on trade, especially amongst low and middle-income economies (Gil-Pareja, Llorca-Vivero, and Martínez-Serrano 2019). There is also wide scholarly consensus regarding the influence of governmental systems on trade, i.e. whether a country is authoritarian or autocratic will have a significant effect on its trade, although the direction of the relationship is less certain (Banerji and Ghanem 1997; Dai 2002; Aidt and Gassebner 2010; Rosendorff and Shin 2015).

Incipient patterns based on new indicators, however, cast doubt on the link between digital trade and the usual institutional determinants. For instance, the Digital Trade Restrictiveness Index (DTRI) suggests that both China and the India — despite having polarised regime structures — are both amongst the most trade-restrictive.

This paper argues that a country's openness or restrictiveness to digital trade is correlated with the size of its industrial sector, as opposed to conventional

determinants such as the overall size of its economy, or its political system. Examining cross-sectional fiscal, labour, and trade data in 64 economies, the study finds that countries with a relatively large industrial labour sector as compared to their service sector tend to impose stricter regulations on digital trade and network-based services.

The findings nuance current understandings of the impact of digital trade, especially as relates to emerging economies. It may be that labour markets respond less swiftly to globalisation, and that restrictive policies on digital trade are largely protracted measures intended to protect a vulnerable industrial sector, likely to suffer in the globalisation process. If even advanced economies had and have to overcome challenges in coping with the digital market, the hurdles are unequivocally greater for developing economies, which often still rely on conventional industries as the backbone of their growth trajectories. The extent to which countries would be willing to open their digital markets therefore transcends mere economic blueprints, and has clear redistributive implications to those at risk of losing their livelihoods.

The paper proceeds as follows. First, we shall examine the extant literature on the digitalisation of goods and services, and show that while restrictive policies are generally understood as welfare-defeating, there is no agreement as to why states prefer restrictive regulations over other policy alternatives. Afterwards, the paper narrows its discussion to the theoretical logic of how the relative size of an economy's industry and service sectors constrain government policies, and, consequently, affect its openness to digital trade. Next, we detail the operational measures used to proxy the variables of interest, as well as the analytical approach used to provide support for our conjectures. This is then followed by a discussion of the findings based on the estimates. The conclusion reiterates the study's empirical observations, and raises several implications not just for trade but also for labour policies.

Situating Digital Trade and its Barriers

As of yet, there is no single agreed definition as to what encompasses digital trade (see Table 1). Some construe it as a broad class of digitally-enabled transactions involving goods and services, which can either be digitally or physically delivered (Lopez-Gonzales and Joanjean 2017). This is, in fact, the definition that the Organisation for Economic Cooperation and Development (OECD) has come to adopt. Others define it as a transaction that is largely commercial in nature, performed remotely through electronic means (Daza

Jaller, Gaillard, and Molinuevo 2020). Meanwhile, the United States Trade Representative (USTR) widens it to include "not just the sale of consumer products on the Internet and the supply of online services, but also data flows that enable global value chains, services that enable smart manufacturing, and myriad other platforms and applications."[1] Some have construed digital trade in its broad and narrow sense, defining it as encompassing commerce in products and services delivered via the internet, as well as enabling innovation and the free flow of information in the digital environment (Burri and Polanco 2020). As it is difficult to pinpoint exactly what digital trade covers, it has also become difficult to measure its impact on a number of policy areas, such as market access, conventional trade, small enterprises, government regulation, and data privacy (Fayyaz 2018).

Table 1. Digital trade as defined in some literature

What is digital trade?	What does it cover?
Digitally-enabled transactions of trade in goods and services that can either be digitally or physically delivered, and that involve consumers, firms, and governments (Lopez-Gonzales and Joanjean 2017).	Digitally-enabled transactions
Broad variety of activities that entail commercial transactions performed, normally remotely, through electronic means (Daza Jaller, Gaillard, and Molinuevo 2020)	Commercial transactions
Includes the sale of consumer products on the Internet and the supply of online services, as well as the data flows that enable global value chains, services which enable smart manufacturing, and myriad other platforms and applications (USTR)	Sale and flow of data
Encompasses commerce in products and services delivered via the internet, as well as the enabling innovation and free flow of information in the digital environment (Burri and Polanco 2020)	Commerce in products and services, innovation, and flow of data

1 *See, in particular, "Key Barriers to Digital Trade", https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2017/march/key-barriers-digital-trade*

Over the last few years, there have been attempts to identify the scope of digital trade, and to operationalise the extent and value of cross border data flows. The US Department of Commerce makes use of the wholesale or retail trade margin, i.e. the total revenue earned from sales alone minus the cost of producing the goods or services sold through the electronic market. This produces a measure that can be reflected in the Gross Domestic Product (GDP) (Barefoot, et al., 2018). The OECD, on the other hand, employs a wide array of methods that include expert judgement, anecdotal evidence, and observations based on the experience and results of comparable countries (OECD 2020). Still, many digital transactions remain beyond the reach of trade statistics simply because they involve no monetary transaction. For instance, blogs and user-generated videos drive very high volumes of internet traffic and produce a financially tangible result, yet are unlikely to be reflected in national accounts because these contents are not paid for by consumers (Lund and Manyika 2016).

Scholars and analysts all seem to agree, however, that digital trade is increasingly being subjected to regulatory interventions, just like international trade (Aaronson 2018; Liu 2019; Ahmed 2019; Daza Jaller, Gaillard, and Molinuevo 2020). Burri (2015) notes that as early as 1998 the World Trade Organisation (WTO) already recognised that digital technologies impact all domains of trade, including intellectual property, although debates on digital trade at that time centred on services and their regulation. But with the advent of hybrid products that transcend the conventional classification between goods and services, governments and multilateral agencies are constantly driven to formulate rules governing the digital economy in subsequent free trade agreements (Meltzer 2020). This is usually either through international regulatory mechanisms to develop standards and mutual recognition agreements in areas such as privacy and consumer protection (Neeraj 2019; Janow and Mavroidis 2019), or via state regulatory instruments such as compulsory registration for foreign suppliers of cross border digital goods and services (van Zyl 2014). There are also firm-level instruments, such as: contract clauses that commit companies to high security and privacy standards; audits and certifications of foreign suppliers; adherence to protections extant in the local laws of foreign suppliers; adherence to international agreements and standards on transaction-related issues; and the more nebulous but equally relevant reputational sanctions (Chander and Le 2017).

The trepidation felt by governments across the world towards digital trade is understandable. Many segments of the digital market are dominated by

technology firms whose oligopolistic presence de facto blocks the entry of new players (Neeraj 2019). Some of these firms have market shares that are expanding faster than their putative sector.[2] The lack of physical presence — for instance, when data is collected in one place, then processed or stored in another — also removes digital transactions from the situs of taxing economies (Ahmed and Chander 2015). The ubiquitous exchange of data across borders has only led to growing concerns about digital security, audit capacity and protection of individual privacy. It has prompted many governments to adopt further regulatory measures, such as placing conditions on the transfer of data across borders, or requiring firms to store data locally for audit and security purposes (Lopez Gonzales and Joanjean 2017).

Digital trade also opens a can of worms from a social justice perspective. Employment in the digital labour market shares many of the characteristics of other kinds of work that may be considered informal or precarious (Akhtar and Moore 2016), and involves a high proportion of non-standard and temporary employment (Moore 2018). This was observed in the service sector decades ago (see, for instance, Nelson 1994) but is now also beginning to characterise the contemporary digital labour market. Workers in these arrangements usually fall outside the statutory protections of collective bargaining, freedom of association and the right to strike (De Stefano 2016). In many developing and emerging countries, internet-mediated production falls beyond state regulatory frameworks, exposing workers to discrimination and underbidding (Graham, Hjorth, and Lehdonvirta 2017). Meanwhile, those who are performing invisible work, such as social media content filtering and editing, are subjected to grave psychological and emotional stress (Cherry 2016).

In addition to the complexities of the digital labour market, it is also clear that digitalisation is not only creating new jobs, but simultaneously rendering others superfluous. Admittedly, structural adaptation in the economy is not new; it has characterised civilisations ever since human beings learnt to engage in commerce. However, adaptation is not necessarily a swift process; as such, it is only coherent for emerging economies, still reliant on many industries that have been rendered superfluous or redundant by digital

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2 *See, for instance, Stacy Mitchell and Olivia Lavecchia, "Report: Amazon's Stranglehold: How the Company's Tightening Grip on the Economy Is Stifling Competition, Eroding Jobs, and Threatening Communities," Institute for Local Self Reliance (ILSR), 29 Nov. 2016, https://ilsr.org/amazon-stranglehold/*

markets, to restrict digital trade as a redistributive policy. Technology may have changed the platform, but certainly not the motivation for why states trade. Trade — whether in the conventional or digital market — follows the logic of comparative advantage and is susceptible to the asymmetries in the labour markets between source and target economies. In a context where resources are imperfectly mobile, who are the real winners and losers?

Unfortunately, this perspective is addressed only vaguely in extant literature.

Labour and Digital Trade Restriction

This paper's theoretical conjecture borrows from political economic theories based on labour factor mobility (Mayer 1984; Gilligan 1997; Hiscox 2001; Mukherjee, Smith, and Li 2009) and structural transformation (Kuznets 1973; Acemoglu 1999; Giovanni and Makridis 2018; Baymul and Sen 2020), and extends their intuitions to digital trade.

In the classic Ricardo-Viner model only mobile factors of production, particularly labour, can move between sectors, but such movement is accompanied by diminishing returns to scale (Jones 1971; Mussa 1974; Borkakoti 1998; Krugman, Obsfelt, and Melitz 2015). Capital is completely immobile and assumed to be differentiated or specific to a particular industry. If a simple economy consists of, hypothetically, just two sectors — industry and services — then capital between them is not substitutable in production. Considering that only labour is mobile, the marginal value of a product corresponds to the increment of revenue obtained by adding a unit of labour to the production process. Since the fixed stock of capital implies that an additional worker has less of the fixed factor to work with, each additional worker will add a smaller increment than the last. Consequently, the value of the marginal product declines as labour in one sector increases.

Suppose that in a digitalised global economy, the price of services rises relative to the industrial sector due to demand for knowledge workers, and to the borderless flexibility of digital trade. This is a fair assumption since the service sector is known to absorb the largest share of employment and value-added when manufacturing declines, or when there is an economic shift (Urquhart 1984; Allen and du Gay 1994; Witt and Gross 2020). Trade also increases employment in consumer services (Bhattacharya and Mitra 1997). Firms in the service sector would be inclined to demand more capital and

workers. On the other hand, the demand for productive capital and labour in the industrial sector would decline. Even though workers in the industrial sector can shift to services, the machines and equipment in the manufacturing industry cannot be easily converted into computers or internet networks, i.e. into the capital required in the digital market. However labour moves from the industrial sector to the service sector, lowering the capital:labour ratio in the service sector and, consequently, causing a decline in the returns to capital in the industrial sector.

This labour factor mobility also has negative consequences on the wage structure. Yabuuchi (2015) observes that where skilled and unskilled workers move in opposite directions, the movement of skilled labour worsens wage inequality due to the resultant concentration of unskilled labour. Moreover, the labour market takes longer to adjust not only because it is sensitive to the mobility of physical capital, such as labour, but also because inter-sectoral mobility entails cost (Dix Carneiro 2014).

In view of these considerations, it is intuitively clear why governments in affected economies would opt to restrict digital trade. Although free trade is welfare-enhancing in the long term, in the absence of redistributive regulations, those in the declining sectors will organise strong opposition against unrestricted digital trade. When the cost of inter-sectoral mobility is high, a specific type of voter gets stuck in the sector threatened by trade competition, and become the median voter. The median voter being an individual characterised by high labour specificity, who will then prefer trade protection (Mukherjee, Smith, and Lee 2009). Politicians, in turn, will pander to the median voter and raise tariffs or create protective policies (Ladewig 2006).

Admittedly, this view oversimplifies the market and assumes that labour can move freely from industry to services regardless of skill differentiation. In reality, labour in the industrial sector is akin to capital, and workers need intervening factors, such as retraining and retooling for mobility.[3]

However, even granting that labour is not easily mobile, there is reason to believe that the relative sizes of the industrial and service sectors are associated with restrictive policies, based on structural transformation. Reexamining Kuznets' (1955) thesis, Baymul and Sen (2020) find that inequality may not

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3 The author thanks an anonymous reviewer for this insight.

necessarily increase with manufacturing-driven structural transformation because activity takes place in the formal sector where labour markets are protected by the minimum wage and by labour legislations. Unlike their counterparts in the service sector, where work arrangements are precarious and informal, it is easier for the organised working class in the manufacturing sector to build political strength when the country industrialises (Baymul and Sen 2020). Again, as in Mukherjee, Smith, and Lee (2009), this prompts reelection-wary politicians to pander to these workers for their votes, and to adopt protectionist policies. Goldberg and Maggi (1999), Scheve and Slaughter (2001), and Matschke and Sherlund (2006) all find that unionisation rates, and the size of industries, are both positively correlated with the level of trade barriers.

The following section examines the relative size of the industrial sector, and how this may be associated with digital trade restrictiveness.

Data and Method

Data used in this study consists of political, fiscal, economic, and trade statistics adapted from various sources. Here, we attempt to examine the potential relationship between labour and digital trade restrictiveness.

As a measure of digital trade restriction we have used the European Centre for International Political Economy's (ECIPE) digital trade restrictiveness index (DTRI). The DTRI is a composite index derived from examining more than a hundred policy measures covering fiscal restrictions, establishment restrictions, data restrictions, and trade restrictions implemented in 64 countries (Ferracane, Lee-Makiyama, and Van der Marel 2016). The higher the index score, the greater the economy's restrictiveness to digital trade. Table 2 summarises its components. As Table 2 shows, the DTRI is broad in scope, and covers not only barriers to the flow of data cited in previous literature, but policy-related barriers, too, such as the domestic commercial environment.

Table 2. Components of ECIPE's digital trade restrictiveness index

DTRI =	Fiscal restrictions and market access	Establish-ment restric-tions	Restrictions on data	Trading restrictions
	Includes: a. Tariffs and Trade Defense, b. Taxation and Subsidies, and c. Public Pro-curement	Includes: a. Foreign Investment Restrictions, b. Intellectual Property Rights measures, c. Competition Policy, and d. Business Mobility	Includes: a. Data Policies, b. Intermedi-ate Liabili-ty, and c. Content Access	Includes: a. Quantitative Trade Restrictions, b. Standards, and c. Online Sales and Trans-actions

Source: (Ferracane, Lee-Makiyama, and Van der Marel 2016).

The ratio of employment in the industrial sector to the service sector, on the other hand, is computed by dividing the statistic for the industrial sector by that of the service sector. Measures for both industrial and service sectors were taken from the International Labour Organisation (ILO) and correspond to percentages of total employment. The ILO defines the industrial sector as consisting of mining and quarrying, manufacturing, construction, and public utilities (e.g., electricity, gas, and water). The services sector, on the other hand, consists of wholesale and retail trade; restaurants and hotels; transport, storage, and communications; financing, insurance, real estate, and business services; as well as community, social, and personal services. A growing number of these services are noticeably being facilitated through digital transactions.

We are also interested to see how the relationship would play out in the presence of political and economic variables, which in the literature are known to influence non-tariff trade barriers. We include governance-related variables based on the Worldwide Governance Indicators (WGI) whose methodology is expounded in Kaufmann, Aart and Mastruzzi (2010). We utilise all six broad dimensions of governance, based on this measure: voice

and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption. Given that the WGI are composite indices, they are admittedly susceptible to a number of limitations (see, i.e., Langbein and Knack 2010). As a crude alternative we also included Freedom House's categorical indicator of democracy. We also accounted for simple regulatory indicators, such as the number of procedures required to start a business, and the time it takes before a firm can operate.

Information and communications technology (ICT) is the main platform by which digital trade is transacted; we thus also accounted for the percentage of the population using the internet and the number of mobile users.

Finally, we included per capita GDP, and unemployment as a percentage of the total labour force, as variables analogous to economic controls.

To harmonise the variables with the DTRI, all measures were based on their 2016 figures.

Discussion

Table 3 gives a descriptive summary of the main variables of interest and the controls. The most restrictive economy based on the DTRI is China (0.70) while the most permissive is New Zealand (0.09). Russia and India trail at second (0.46) and third (0.44) respectively in terms of restrictiveness. The United States, the so-called bastion of free market capitalism in the Western hemisphere, has a restrictiveness index of 0.26 — a score that is surprisingly more restrictive than the average 0.24 for all 64 countries.

The ratio of the industrial to the service sector does not exceed one, and echoes the observation that the service sector disproportionately dominates the modern economy (Buera and Kaboski 2012). A ratio close to one means the industrial sector is as large as the service sector, and implies that the industrial sector remains substantial and relevant amidst digitalisation. The mean industry:service ratio in the data is 0.36, signifying that typically the service sector is three times as large as the industrial sector. We presume that countries detaining a relatively substantial industrial sector will to be more restrictive of digital trade. Vietnam and India have the highest industry:service labour ratio, at 0.74 and 0.77 respectively. Interestingly, India is 3rd in terms of digital trade restrictiveness, while Vietnam ranks 5th. Figure 1 plots countries according to their industry:service labour ratio, and their DTRI

scores. Although the plot appears to follow the direction of our hypothesised relationship, we shall look into this in more detail in the next section.

Table 3. Descriptive summary

Variable	Obs	Mean	Std. Dev.	Min	Max
Digital trade restrictiveness	64	0.244	0.104	0.090	0.700
Ratio of industry labour to services	63	0.358	0.149	0.137	0.777
Voice and accountability	63	0.642	0.803	-1.561	1.664
Political stability and absence of violence	63	0.308	0.876	-2.483	1.519
Government effectiveness	63	0.859	0.789	-1.088	2.206
Regulatory quality	63	0.852	0.832	-1.018	2.181
Rule of law	63	0.751	0.904	-1.017	2.036
Control of corruption	63	0.687	1.002	-1.025	2.284
Mean Worldwide Governance Index	63	0.683	0.801	-1.041	1.862
Percentage of population using the internet	63	0.724	0.195	0.124	0.982
Democracy (Y/N)	62	0.871	0.338	NO	YES
Mobile users per 100 people	63	124.000	25.403	67.028	242.768
GDP per capita	63	26464	22247.86	1368.5	104278
Unemployed as percentage of total labour force	63	0.071	0.046	0.007	0.266
No. of procedures to start a business exceeds seven	64	0.375	0.488	NO	YES
Weeks it takes to start a business	63	2.295	2.037	0.071	11.786

Sources: ECIPE, WorldBank, and ILO (data retrieved on 10 August 2020)

Table 4. Pairwise correlations of variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Digital trade restrictiveness	1.000															
(2) Ratio of industry labour to services	0.528*	1.000														
	(0.000)															
(3) Voice and accountability	-0.643*	-0.474*	1.000													
	(0.000)	(0.000)														
(4) Political stability and absence of violence	-0.550*	-0.384*	0.643*	1.000												
	(0.000)	(0.002)	(0.000)													
(5) Government effectiveness	-0.448*	-0.426*	0.678*	0.764*	1.000											
	(0.000)	(0.001)	(0.000)	(0.000)												
(6) Regulatory quality	-0.598*	-0.488*	0.730*	0.723*	0.941*	1.000										
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)											
(7) Rule of law	-0.514*	-0.435*	0.760*	0.771*	0.971*	0.944*	1.000									
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)										
(8) Control of corruption	-0.508*	-0.502*	0.754*	0.740*	0.948*	0.925*	0.970*	1.000								
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)									

(9) Mean Worldwide Governance Index	-0.588*	-0.490*	0.822*	0.840*	0.960*	0.952*	0.981*	0.968*	1.000							
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)								
(10) Democracy (Y/N)	-0.501*	-0.265*	0.739*	0.207	0.121	0.229	0.227	0.228	0.312*	1.000						
	(0.000)	(0.038)	(0.000)	(0.109)	(0.352)	(0.076)	(0.078)	(0.077)	(0.015)							
(11) % of population using the internet	-0.485*	-0.537*	0.616*	0.775*	0.851*	0.818*	0.836*	0.817*	0.854*	0.096	1.000					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.459)						
(12) Mobile users per 100 People (log)	-0.239	-0.263*	0.108	0.361*	0.307*	0.335*	0.256*	0.225	0.287*	-0.179	0.328*	1.000				
	(0.059)	(0.037)	(0.405)	(0.004)	(0.015)	(0.008)	(0.045)	(0.079)	(0.024)	(0.163)	(0.009)					
(13) GDP per capita (log)	-0.491*	-0.619*	0.702*	0.758*	0.895*	0.869*	0.881*	0.880*	0.903*	0.182	0.901*	0.272*	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.156)	(0.000)	(0.031)				
(14) Unemployed as % of total labour force	-0.019	-0.184	0.171	-0.012	-0.088	-0.098	-0.071	-0.078	-0.035	0.183	-0.006	-0.016	0.007	1.000		
	(0.882)	(0.148)	(0.185)	(0.925)	(0.494)	(0.448)	(0.585)	(0.546)	(0.788)	(0.154)	(0.960)	(0.900)	(0.958)			
(15) Procedures to start a business exceeds seven	0.217	0.339*	-0.268*	-0.378*	-0.445*	-0.449*	-0.443*	-0.443*	-0.440*	-0.003	-0.452*	-0.212	-0.522*	-0.169	1.000	
	(0.085)	(0.007)	(0.034)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.980)	(0.000)	(0.096)	(0.000)	(0.185)		
(16) Weeks it takes to start a business	0.363*	0.267*	-0.353*	-0.340*	-0.599*	-0.606*	-0.570*	-0.546*	-0.546*	-0.034	-0.506*	-0.080	-0.543*	0.128	0.462*	1.000
	(0.003)	(0.034)	(0.005)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.791)	(0.000)	(0.531)	(0.000)	(0.316)	(0.000)	

p<0.05

Figure 1. Digital trade restriction and ratio of industry:services labour

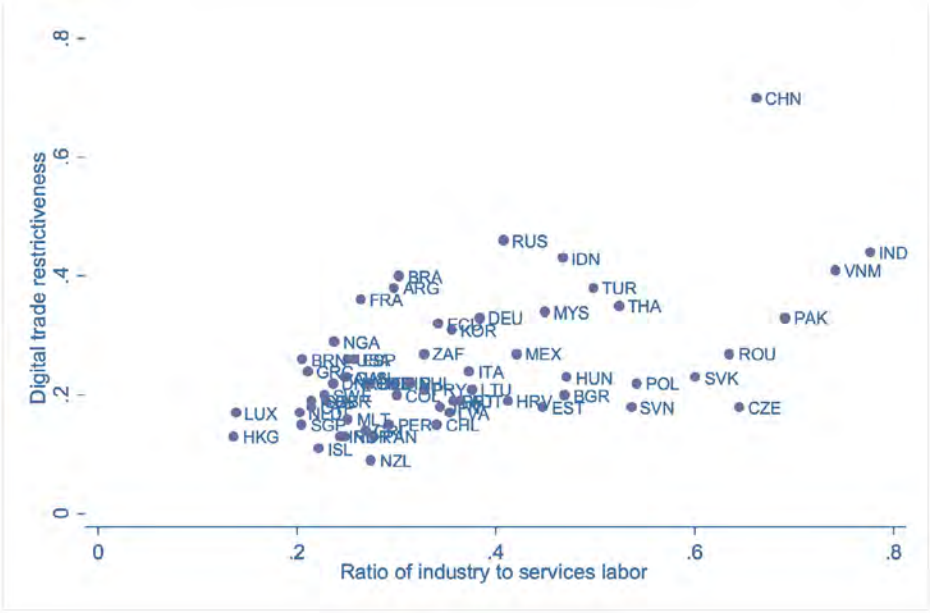

Table 4 is a matrix that shows the correlation coefficients of the variables. Below the coefficients are corresponding p-values, significant at the 0.05 level. The relationship of the industry:service labour ratio with that of digital trade restrictiveness is in the expected direction. The correlation implies that there are more barriers to digital trade in countries where the size of the industrial sector is substantial, relative to the service sector. As implied in the previous section, the service sector has long outpaced the industrial sector in many economies. The growth of the service sector is attributed to a number of factors, including technological change, movements in capital prices (Lee and Wolpin 2006), as well as the shift into skill-oriented consumption (Buera and Kaboski 2012).

The service sector accounts for essential intangible goods in banking, government, transport, retail, entertainment, and social services, but it also drives workers to enter non-standard or atypical arrangements that deprive them of bargaining power. Consequently, unions in the service sector have seen a steady decline in membership despite efforts to extend collective bargaining to cover unconventional work arrangements and attempts to introduce digital unions (Dolvik and Waddington 2002).

Trade unions in general have been in decline in the last two decades (Wallerstein and Western 2000). But formal work arrangements at least allow workers in their respective industries access to the protective mantle of social legislation. Collective rights also afford workers leverage as an interest group, allowing them to engage policymakers at various levels. Even industrialised countries, in the guise of promoting humane work conditions, have been known to invoke labour standards as protectionist measures directed against the exports of developing countries (Kim 2012).

Reconciling Table 4 with Figure 1, barriers characterise the digital trade regime in emerging economies, such as China, Vietnam, and India. As with advanced economies in their heyday, all three countries underwrite their growth trajectory to a sizeable manufacturing industry. China has long been criticised for weak intellectual property protections and unfair trade policies even though tech firms such as Huawei and ZTE are among the world's most prolific patent filers. Nonetheless, observers doubt whether China will easily abandon protectionist practices as it remains in the country's national interest to promote domestic high-tech industry at the expense of free trade.[4] As China's economy slowly matures, protectionism will likely remain a core principle of its policy, as global companies still depend on its manufacturing capacity.[5] India is following suit, urging the World Trade Organisation (WTO) to reconsider tariffs on e-commerce,[6] and banning a number of mobile applications, citing the need to level the playing field for local start-ups competing with tech giants.[7] Vietnam, for its part, has already

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4 *William Weightman, "Why China Won't Abandon Its Controversial Trade Policies", The Diplomat, 24 May 2018, https://thediplomat.com/2018/05/why-china-wont-abandon-its-controversial-trade-policies/*

5 *The FT View, "China's protectionism comes home to roost", The Financial Times, 04 January 2018, https://www.ft.com/content/14196546-f098-11e7-ac08-07c3086a2625*

6 *Press Trust of India, "India urges WTO members to reconsider moratorium on duties on e-commerce", Business Standard, 15 July 2020, https://www.business-standard.com/article/economy-policy/india-urges-wto-members-to-reconsider-moratorium-on-duties-on-e-commerce-120071501898_1.html*

7 *Saheli Roy Choudhury, "India's existing data privacy laws are inadequate in protecting people's information," CNBC, 13 July 2020, https://www.cnbc.com/2020/07/14/india-chinese-apps-ban-data-protection-laws.html*

adopted a policy of data localisation[8] as part of its cybersecurity law as early as 2018, notwithstanding criticism that it would undermine digital free trade.[9]

The matrix also shows that indicators related to governance are correlated with digital trade restrictiveness in the direction consistent with extant literature. Although the indicators pertaining to voice and accountability and regulatory quality show greater correlation with digital trade restrictiveness, like the DTRI they are also composite indices and, thus, should be interpreted with caution. Their coefficients nonetheless suggest that digital trade openness is tied to good governance. The correlation matrix also suggests that democracy is associated with a freer flow of goods and services in the digital economy. Trade liberalisation has long been associated with economic performance (see, for instance, Winters 2004) although the direction of causation is not yet fully established (Frankel and Romer 1999). The negative correlation between GDP per capita and DTRI in the matrix suggests that our result is consistent with this perspective.

Conclusion

Our analysis of cross-sectional fiscal, labour, and trade data in 64 economies suggests that the relative size of a country's industrial sector is correlated with its degree of digital trade protectionism, in the same manner as economic growth correlates with the political system. However, the findings should be construed as exploratory given the limitations of the data. For instance, the DTRI only covers 64 countries. In addition, many of the measures adapted in the study are composite indices derived from other measures and need to be understood beyond their straightforward interpretation. This is partly the reason why our analysis has been modestly limited to correlations. However, readers curious to know how regression models would fit with these specifications may refer to Annex 1. As with many economic indicators, the quest is still on for a reliable and valid measure of digital trade restrictiveness that can capture observations in as many countries and over as many time periods as possible.

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8 *Data localisation is a requirement for an entity that deals with or processes data from citizens in a given territory to store such data within the borders of said territory. It is considered an impediment to the free flow of data.*

9 *Nigel Corey, "Vietnam's cybersecurity law threatens free trade", Nikkei Asia, 15 August 2018, https://asia.nikkei.com/Opinion/Vietnam-s-cybersecurity-law-threatens-free-trade*

Be that as it may, these musings shed light on the uneasy relationship between labour and digital trade, and the dilemma facing policymakers in developing economies. It is possible that protective measures, which regulate digital trade, are policies that buy fledgling economies time to insulate vulnerable sectors, and are intended for those which stand to lose as labour shifts to services in the digital economy. Protection from this angle, to borrow from Ramstad's (1987, 26) restatement of economist John R. Common's Theory of Reasonable Value, "is not an unnatural impediment to economic progress but simply an instrument to be used, when necessary, to safeguard the reasonable practices that have already been obtained through collective action." Labour markets respond more slowly to globalisation and, as the experience of even advanced economies such as US and Canada shows, the process is attended by employment loss and by the decline of manufacturing industries (Gera and Mang 1998; Pierce and Schott 2016). While high-growth nations and multilateral agencies strongly advocate free trade, the theory that trade openness indeed facilitates economic development remains largely empirical in nature (Rodriguez and Rodrik 2000; Carlsson, and Lundstrom 2002; Dawson 2003).

Where do states go from here? Although conventional literature touts the free flow of goods and services as welfare-enhancing in the long-run, in the experience of fledgling economies there is no easy answer. Advanced economies may pressure small states in the multilateral arena to abandon their industries in favour of the burgeoning service sector in the digital economy, but this too has its downsides. Even in welfare states such as Sweden, gig markets are not only able to evade governmental taxes, they are also able to bypass trade unions and employer organisations responsible for wage-setting (Blix, 2017). In Indonesia, high income inequality accompanied the country's abrupt agriculture-to-service transition, given that this was undertaken before the industrial sector matured (Dartanto, Yuan, and Sofiyandi 2017).

Given the technological innovations which shape our world, the shift towards a digital economy is inevitable. However, this does not mean that states cannot minimise the impact of this shift. Policymakers can start with initiatives that not only give training in ICT, but also which encourage cultural and social shifts toward genuine digital citizenship (Bach, Shaffer, and Wolfson 2013). States may also adapt social insurance mechanisms that embrace all workers, regardless of industry and type of engagement (Berg, et al. 2018). For instance, social policies may be reoriented towards investing in human

capital, enhancing employability, or providing coverage for social risks, such as single parenthood or atypical employment. Wilthagen and Tros (2004), for instance, recommend a "flexicurity" approach, which enhances not only the flexibility of labour markets, but also the security of weaker groups outside of them. Malin (2018), on the other hand, recommends adopting a franchise-franchisee framework for workers in the digital economy to ensure statutory protection.

Ultimately, it seems only prudent for governments to protect not just industries that are politically important, but also those that are weak or in decline. Policies purportedly seeking to promote digital trade, therefore, must take into account its repercussions on workers, and weigh whether a pursuing a fast-paced digital shift is worth the attendant economic dislocations.

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Annex 1. Digital trade restrictiveness as a function of industry:services labour ratio

	(Model 1)	(Model 2)	(Model 3)	(Model 4)
	Digital trade restric-tiveness	Digital trade restric-tiveness	Digital trade restric-tiveness	Digital trade restric-tiveness
Proportion of industrial over service sector	0.371***	0.267**	0.360**	0.203*
	(0.0985)	(0.0983)	(0.132)	(0.0896)
Voice and accountability		-0.0448		
		(0.0232)		
Political stability and absence of violence		-0.0557**		
		(0.0201)		
Government effectiveness		0.127*		
		(0.0550)		
Regulatory quality		-0.129***		
		(0.0348)		
Rule of law		-0.0254		
		(0.0595)		
Control of corruption		0.0274		
		(0.0385)		
Mean World Governance Index			-0.120**	
			(0.0357)	
Regime type (Democracy = 1)				-0.146**
				(0.0456)
Percent of population using the internet		-0.0388	-0.0327	-0.164
		(0.130)	(0.145)	(0.136)
Mobile users per 100 people (log)		0.00451	-0.0165	-0.107
		(0.0575)	(0.0532)	(0.0733)
GDP per capita (log)		0.0462*	0.0750*	0.0196
		(0.0219)	(0.0338)	(0.0256)

Percentage unemployed of total labour force		0.114	0.0111	0.188
		(0.163)	(0.174)	(0.152)
Number of business procedures exceed 7		-0.0180	-0.0186	-0.00940
		(0.0242)	(0.0323)	(0.0282)
Weeks it takes to start business		0.0101	0.00673	0.0113
		(0.00577)	(0.00621)	(0.00603)
Constant	0.112***	-0.274	-0.442	0.703
	(0.0309)	(0.351)	(0.401)	(0.361)
N	**63**	**62**	**62**	**62**
R squared	**0.278**	**0.700**	**0.511**	**0.538**

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Annex 1 summarises the results of cross-sectional regression models testing the relationship between the industry:services labour ratio and digital trade restrictiveness. Model 1 contains an estimate with only the industry:services ratio as an explanatory variable. Model 2 is a fully specified model controlling for each component of the Worldwide Governance Indicators. Model 3 replaces the WGI with a single indicator based on the average of all six indicators. Model 4 does away with the WGI indicators and uses Freedom House's categorical classification of whether or not a country is a democracy. Of the 64 countries in the study, only 62 have complete observations for all variables. Since by listwise deletion only correlations for observations with non-missing values are displayed, Models 2 to 4 show estimates for only 62 countries.

All models indicate that the labour factor ratio correlates in the expected direction and confirms that economies whose industrial sector is substantial relative to its services sector also tend to be more restrictive of digital trade. In Model 2, for instance, a 10 per cent increase in the industry:service labour ratio increases restrictiveness by up to 0.03 points in the DTRI index, ceteris paribus. There is no straightforward interpretation of indices, but to provide context we can consider France, the most restrictive EU country according to Ferracane, Lee-Makiyama, and Van der Marel (2016), and note that it is only about 0.03 points away from Germany in terms of DTRI score.

There are other interesting observations. For instance, among the governance indicators, it seems that political stability, government effectiveness, and regulatory quality — rather than control of corruption — are the more crucial facilitators of digital trade. This result, however, needs to be taken with a grain of salt as the governance indicators are highly correlated. Model 3 averages the score for all six indicators into a single metric (mean Worldwide Governance Indicators). This coefficient likewise suggests that good governance is a catalyst of digital trade openness. Model 4, for its part, indicates that states with democratic regimes tend to have less restrictive digital markets, which is consistent with prior scholarly observation (see, i.e., Milner and Kubota 2005). All these suggest, at the very least, that it may be worthwhile to examine the role of governance in removing digital trade barriers in future research.

The positive significant relationship between GDP per capita and digital trade restrictiveness suggests that the more affluent economies also tend to be more protective. Although this effect is no longer significant in Model 4, it echoes the view that countries with the highest growth rates are not necessarily the most liberal when it comes to trade (Dornbusch 1992). The relationship between economic growth and digital protectionism definitely is another interesting area that warrants further study.

All across the models we tested, however, only the industry: service labour ratio is consistent, at least based on our specified parameters.

Digital Trade in the Asia Pacific

Deborah ELMS

A Connected Future

The world is experiencing unprecedented increases in connectivity and global data flows, which underpin the Fourth Industrial Revolution (4IR). The evolution of the digital economy is closely associated with progress in several frontier technologies, including some key software-oriented technologies, such as blockchain, data analytics and Artificial Intelligence (AI).[1] Other emerging technologies range from smartphones to 3D printers and specialised machine-oriented hardware, such as Internet of Things (IoT), automation, robotics and cloud computing. These emerging technologies have opened new possibilities for countries at all stages of development.[2]

For instance, the global IoT market is expected to grow tenfold, from 151 billion USD in 2018 to 1,567 billion USD by 2025. It is estimated that, by 2025, an average connected person in the world will interact with IoT devices nearly 4,900 times per day, or the equivalent of one interaction every 18 seconds. Such rapid growth in the use of IoT will generate a further explosion of digital data.[3] The effective use of this data can, in turn, create additional products and service offerings better tailored to market demands.

AI and data analytics have the potential to generate an additional global economic output of approximately 13 trillion USD by 2030, contributing an additional 1.2 per cent to annual GDP growth.[4]

While the COVID-19 pandemic has knocked down economic growth around the world, it has simultaneously accelerated the movement towards digital trade. Companies and consumers have been selling and ordering more goods online through e-commerce channels and providing and consuming a wider array of digital services, from Zoom meetings and webinars to increased streaming and livestreaming.

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1 *Joshua P Meltzer and Peter Lovelock, 'Regulating for a Digital Economy: Understanding the Importance of Cross-Border Data Flows in Asia' (Brookings, 20 March 2018) <https://www.brookings.edu/research/regulating-for-a-digital-economy-understanding-the-importance-of-cross-border-data-flows-in-asia/> accessed 15 September 2020.*

2 *BRACKFIELD David, 'Handbook on Measuring Digital Trade' 156.*

3 *United Nations Conference on Trade and Development, Digital Economy Report 2019: Value Creation and Capture : Implications for Developing Countries (2019).*

4 *ibid.*

Achieving sustained high rates of growth of the digital economy requires supportive policies and frameworks. Until quite recently, digital trade flourished in a nearly-unregulated environment. Governments have struggled to adapt off-line rules and regulations to an online setting, or instead simply ignored elements of the digital economy entirely.

While it may seem that companies engaged in digital trade might prefer to remain in unregulated spaces, such a situation can be less than ideal. Piecemeal regulations or poorly adapted rules shoehorned to fit a digital setting can create unnecessary uncertainty for companies. The risks of accidentally falling foul of rules is significant, especially for companies engaged in cross-border trade. In the digital world, even tiny firms in remote locations have the capacity to become multinational enterprises. Increasing digital regulatory fragmentation can hit smaller firms hardest, as they have the least capacity to monitor changes and adjust or adapt to fit changing policy requirements. Complex rules may have the unintended consequence of driving firms to become larger or even become a monopoly power, as only the biggest companies can manage the compliance costs of an increasingly complicated environment.

The growing size and prominence of the digital economy makes a continuing "hands off" approach by governments politically and economically impossible. Officials are increasingly engaged in a variety of efforts to sort through the optimal policy settings that should be employed to tackle a range of issues related to digital trade in goods and services.

This article examines an array of particularly urgent topics. Some of the issues, such as cross-border flows of data or information, have been under discussion for some time, and are governed by a variety of policies anchored in several trade agreements in the Asia-Pacific region, which have the goal of ensuring that data continues to flow as freely as possible. Not every government, however, has been convinced of the importance of moving data. The article also examines restrictions on data flows, including a growing variety of rules and regulations in place to prevent the offshoring of information, ensure that citizen data remains locally hosted, or impose restrictions on certain types of information flows.

Data obviously underpins the digital economy, and rules on cross-border trade that restrict data flows can have significant implications for the future growth and prospects for large and small firms around the world. But data is

not the only issue that governments are grappling with as they seek to create sensible regulatory frameworks to manage the rise of the digital economy. Different institutions in the Asia-Pacific region, including the Association of Southeast Asian Nations (ASEAN) and the Asia Pacific Economic Cooperation (APEC), have tackled aspects of digital rules. Some of these initiatives have been replicated or reinforced in a variety of bilateral and regional trade agreements. Eventually many of these initiatives may expand to the global level.

Definitional Challenges

While governments across Asia are aware of both the importance and swift growth of the digital economy, there remains limited consensus on many key terms or elements. For example, although nearly every government has urged firms to digitalise, the shape, form and content of what is meant by digital trade remains less clear. In part, this disconnect over basic definitions comes from the divergent audiences involved in the topic. For instance, when trade officials and trade negotiators talk about the digital sphere, they tend to focus on specific trade rules related to e-commerce, regarding trade in physical goods. Yet not only can e-commerce be wider that trade in goods, but the digital sphere itself is wider than e-commerce.

To start with, services can also be traded. When officials first crafted rules governing trade in services at the global level in the late 1980s, they divided services into four broad categories depending on who or what "moved." For example, if no one delivering architectural services moved over a border, but instead exchanged plans, blueprints or drawings via mail or post, the service was categorised under "Mode 1." If, however, the person asking for architectural services flew to the overseas location of the architect, this transaction would fall under Mode 2.[5] While Mode 1 was mostly focussed on service delivery by mail or fax machine, it has been adapted to fit digital delivery of services. However, since some governments, at the time of the original negotiations, were concerned about service delivery in these newly

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5 *For completeness, if the architect set up a local office to provide services, this was considered Mode 3. Finally, if the architect flew to the market to personally deliver the service to her client, this was counted under Mode 4. Governments in the General Agreement on Trade in Services (GATS) made different commitments for each type of service by the four modes of delivery.*

created categories, and what new forms of commitments might mean for their domestic economies, not all governments actually opted to schedule all services, and many included specific types of restrictions on various modes of delivery. The net result is that while the global rules on trade in services can be adapted to fit digital trade in services, not every government has formal, existing commitments that extend to the movement of such services.

The digital economy is a broader term that often encompasses, for the trade community, both goods and services. However, legacy nomenclature also means that many conversations about the broader definitions of the digital economy, to include topics on goods and services as well as intellectual property rights and other adjustments that may be needed to better capture digital trade, are often lumped together under the heading of e-commerce.

To see how divergent definitional issues and different approaches to digitalisation play out in ongoing trade negotiations and agreements, it can be helpful to narrow the focus. The two topics of data flows and data localisation, in particular, have been part of digital trade discussions for more than a decade, making it easier to see differences in approaches taken by governments in Asia. These two foundational issues cut across nearly all aspects of the digital economy, which is partially why they have featured prominently in ongoing trade negotiations and agreements. Before getting into the treatment of data, it can be helpful to quickly review some of the issues involved in both cross-cutting topics.

Data Flow Issues

The cross-border flow of data is an essential aspect of the modern world economy. It enables firms to trade and operate internationally, while providing consumers with access to the global market for goods and services. The Asia Pacific continues to be one of the fastest growing regions in the world, both economically, and in terms of connectivity. By 2017, Asia had the largest number of internet users in the world, with 1.9 billion people online.[6] Annual estimates of the size of the digital "pie" are being continuously updated, as

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6 Lovelock (n 1).

new statistics on the size of Asia's digital market consistently overshoot past previous projections.[7]

This strong growth in digital trade has also unsettled governments around the world. As Singapore's Trade Minister Chan Chun Sing noted, officials have a variety of fears that can prevent the open embrace of the digital economy.[8] Such fears include: lack of understanding of specific types of technology; worries about fiscal revenue implications from a rise of digital trade; uncertainty about who benefits from the digital economy with concerns that foreign players alone may capture the biggest gains from digital trade; domestic economy workforce challenges in the digital future; and worries about potential threats in the online world.

While there is a wide range of options when it comes to addressing each of these concerns, one "solution" that has been spreading rapidly in Asia has been a decision that data should no longer be allowed to flow freely across borders. Restrictions on data flows can take a variety of forms, from requiring that all data or certain types of data be hosted locally (so called "data localisation" requirements) or prohibitions on the movement of citizen data offshore (which, by implication, means that data must *only* be hosted onshore).

The converse approach has also been taken by some governments to tackle these fears: to prevent the imposition of new barriers to data flows or to require that data continue to be able flow freely. Ensuring free data flows does not automatically mean that there are no consequences to unintended leaks of information. Cybersecurity and data breach enforcement remain key policy objectives. Pledges to maintain the free flow of data have been embedded in a range of different trade instruments used in the region, which shall be outlined further below.

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7 The four-year series by Google and Temasek, for instance, repeatedly underestimated the size of the potential market. The latest document, released in 2019 by Google, Temasek and Bain, revised the figures upwards again. The first publication expected the market in Southeast Asia to reach 200 billion USD by 2025. The 2019 report noted that the region had already crossed the 100 billion USD mark. See https://www.bain.com/globalassets/noindex/2019/google_temasek_bain_e_conomy_sea_2019_report.pdf

8 See his comments at a PIIE webinar on September 16, 2020, (https://www.piie.com/events/can-digital-trade-agreements-spur-next-round-growth) which were also reported in the Straits Times, https://www.straitstimes.com/singapore/us-can-play-leading-role-in-global-digital-integration-chan

Data Localisation in the Asia Pacific

As Minister Sing noted, concerns over data stem from a variety of reasons. But a significant part of the push towards changing attitudes on data flows comes from worries about citizen information and data privacy issues. In Europe and elsewhere, the push to restrict data has tended to come from citizens. Conversely, in Asia, such decisions have often come from governments.

The use of localisation rules are often tangled with personal privacy protection rules. In some instances, governments have created data hosting regulations as a consequence (intended or otherwise) of policies to protect citizen information. In other cases, officials have created explicit data localisation rules and regulations.

Singapore is a useful case study when examining the connection between personal data and data localisation. The government has enacted several personal data protection laws, which are intended, as the name suggests, to ensure that a citizen's personal data has been properly collected, used, and stored.[9] These laws make it harder to move Singaporean citizen data offshore. However, Singapore has tried to carefully calibrate the protection of personal information with the imperative of allowing data flows to continue, subject to certain constraints and with enforcement in place for firms that violate the law.

It is, by contrast, possible to imagine a government putting in place such draconian restrictions on the movement of personal data, or requiring such extensive consent to move information, that the net effect is to prohibit data from flowing at all. So far, governments have not gone down this path. But some are increasingly restricting the movement of certain types of personal data, e.g. medical records, such that these rules amount to de facto localisation rules for a specific type of information.

In other circumstances, Asian governments have been proposing or imposing regulations that are not data localisation by indirect means, but rather by explicitly mandating local hosting requirements. Offshore hosting regulations can be restricted to certain sectors, such as personal health data, or extended more broadly.

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9 *https://www.pdpc.gov.sg/overview-of-pdpa/the-legislation/personal-data-protection-act*

For instance, Indonesia issued Government Regulation No. 71 of 2019 on the Implementation of Electronic Systems and Transactions (GR71) in October 2019.[10] GR71 updated an older regulation, significantly expanding its coverage. While the new rules appear to limit explicit data hosting requirements to public electronic systems, they also expanded the scope of "strategic electronic data" that needs to remain onshore. Such data includes finance, health care, information and communications technology (ICT), food and defence information. In addition, all electronic service operators must have received certified electronic transmissions certificates.

Another example of explicit data hosting laws can be found in Vietnam's Law on Cybersecurity, and its implementing decrees. The law covers enterprises providing services on telecommunications networks, the Internet, as well as value-added services on cyberspace in Vietnam, including telecommunications services, e-commerce, data storage and sharing, online payments, online games, and social media.[11] Such enterprises will be prohibited from providing such services from offshore locations.

Multilateral and Regional Approaches to Digital Trade

The tensions between governments taking different approaches with regard to data movement, handling of data flows, and data hosting requirements spill over into a wide range of other digital provisions.

One challenge has been the lack of global rules to manage digital trade, which means that governments have more flexibility to design country-specific responses to the digital economy. The internet, however, was never built to recognise country boundaries, leading to increasing difficulties in managing and regulating digital trade.

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10 https://www.bakermckenzie.com/en/insight/publications/2019/10/new-regulation-electronic-system-and-transactions

11 https://www.bakermckenzie.com/en/insight/publications/2019/10/updates-draft-decree-law-on-cybersecurity Note, however, that some of the implementing rules, currently outlined in a "draft decree" have been postponed (likely due to Covid-19).

Progress at the WTO

The World Trade Organisation (WTO) was launched out of the General Agreement on Tariffs and Trade (GATT) in 1995. The year is now widely viewed as the dawn of the commercialised internet as the last restrictions were removed on commercial traffic on what was then called the World Wide Web.[12] Amazon and the forerunner of eBay launched in 1995, when the international data corporation (IDC) estimated that there were 16 million global internet users.[13]

While internet usage has exploded in the decades since, the WTO rulebook has remained almost completely unchanged.[14] Governments have been able to manage some of the transition to digital by reinterpreting existing provisions. For instance, the General Agreement on Trade in Services (GATS) defined "Mode 1" delivery of services broadly enough to capture much of the cross-border trade in services.[15]

Yet, as the internet and the digital economy have grown, gaps in coverage have become ever more glaring. Hence, in 2017, members of the WTO announced the launch of exploratory talks on the potential negotiation of trade rules on electronic commerce (the so-called "Joint Sector Initiative" or JSI).[16] Later, in January 2019 at Davos, 76 members of the WTO announced the intention to begin negotiations, based on existing WTO agreements. The announcement also invited more members to join the JSI process and

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12 *The original intention of the internet was to connect laboratories involved in government research.*

13 *https://www.internetworldstats.com/emarketing.htm*

14 *Exceptions include two smaller, plurilateral agreements to reduce tariffs on Information, Communication and Telecommunications (ICT) products called the ITA1 (December 1996) and updated into ITA2 (July 2015) and an agreement on trade facilitation reached in 2014.*

15 *One limitation noted earlier is that many governments undertook only slender commitments in GATS since services trade rules were new and it was not certain how GATS might apply in practice. Given the methods used by GATS to address services trade, any government that did not specifically "open" a sector or subsector under Mode 1 is not required under the WTO to offer up market access now.*

16 *'WTO E-Commerce Moratorium and Plurilateral Talks: State of Play' (Borderlex, 6 April 2020) <https://borderlex.eu/2020/04/06/wto-and-e-commerce-moratorium-and-plurilateral-talks-state-of-play/> accessed 14 September 2020.*

acknowledged that challenges associated with e-commerce were different for developing countries and Least Developed Countries (LDCs). Thus far, 83 (out of a possible 164) members have become part of the JSI talks, including Benin, Saudi Arabia, Kenya, Côte d'Ivoire, Cameroon, Indonesia and the Philippines.[17]

The JSI plurilateral talks have been challenging. The original intention was to establish a framework ahead of the 12th WTO Ministerial meeting, intended for June 2020. While COVID-19 prompted the postponement of the meeting until 2021, the JSI negotiators would not have been able to produce a clear outcome in time for the gathering.

Indeed, JSI participants are struggling to reach an agreement. Notwithstanding the fact that the initiative includes only participants that have volunteered to join, members continue to grapple with divergent views on a wide variety of topics. Moreover, the JSI agenda has also grown to include a range of topics related to the digital economy, including: data flow and data localisation issues; digital trade facilitation and customs procedures; and changes in intellectual property rights to reflect changing digital patterns of behaviour.

Regional Efforts to Address Digital Economy Challenges

The WTO JSI process is likely to take substantial time to reach an outcome. In the meantime, governments have been actively working on similar digital issues in a wider variety of settings, especially in Asia. Two of the region's most prominent organisations, ASEAN and APEC, have also been engaged in crafting rules for the digital future.

The 10 member states of ASEAN[18] showed early initiative in addressing digital trade, with the inclusion of an e-commerce chapter in their trade agreement with Australia and New Zealand (AANZFTA) in 2010.[19] It included important elements, such as allowing electronic authentication and digital certificates,

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17 *'#EUTrade News' (Trade - European Commission) <https://trade.ec.europa.eu/doclib/press/index.cfm?id=1974> accessed 11 September 2020.*

18 *Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.*

19 *AANZFTA is due for an upgrade in 2020. See the original chapter at: https://aanzfta.asean.org/chapter-10-electronic-commerce/*

providing online consumer and data protection, and moving towards paperless trade. An upgrade of the entire agreement, scheduled to begin in 2020, will certainly update these early digital provisions.

ASEAN signed its first internal Agreement on Electronic Commerce in November 2018. This agreement put some useful provisions in place. It urges member states to use paperless trading schemes, and encourages electronic usage of information (other than financial services) including using digital signatures. It exhorts members to be transparent about consumer protection measures, and urges online personal information protection.

However, most of the agreement remains at the level of cooperation, especially with regard to key elements. This includes commitments that will cover issues of ICT infrastructure, legal and regulatory frameworks, electronic payments and settlement, trade facilitation, intellectual property rights in the digital era, competition policy, cybersecurity, and so forth.

In the meantime, a different workstream in ASEAN, led by telecommunications ministers, focussed upon crafting a framework for digital data governance. This framework, which was due to be completed in 2020 (under pre-COVID timelines), includes four elements.[20] Of key interest is a mechanism for managing cross-border data flows in the region.

The details are still under discussion, but the plan is to have two approaches to handling the exchange of digital data in the region, including the use of contractual clauses between companies, and business certification, in line with the APEC system (described further below).

The ASEAN Work Programme on Electronic Commerce (AWPEC) 2017-2025 now includes: infrastructure, education and technology competency, consumer protection, legal frameworks, security of electronic transactions, competition, and logistics.[21] However, the founding document, the ASEAN

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20 For more details, see https://www.usasean.org/system/files/downloads/digital_data_governance_in_asean-key_elements_for_a_data-driven_economy.pdf

21 For more details on the AEM e-commerce processes, see https://asean.org/asean-economic-community/sectoral-bodies-under-the-purview-of-aem/e-commerce/ accessed January 3, 2020.

Agreement on Electronic Commerce, is not yet in force, as only four ASEAN members have signed it.[22]

Seven of the ten ASEAN members are also part of APEC.[23] ASEAN has drawn on the experiences of the larger organisation in developing its rules on cross-border data flows. In 2011, APEC began the Cross-Border Privacy Rules (CBPR) system, under which companies trading within the member economies develop their own internal business rules consistent with APEC privacy principles so as to secure cross-border data privacy.[24]

The CBPR system serves as a mechanism that fosters trust and facilitates data flows amongst participants. It attempts to create a regional solution across 21 member economies, with members at different stages of compliance with the Privacy Framework. To date, eight nations have joined the CBPR system — the US, Canada, Mexico, Japan, Singapore, Taiwan, Australia and the Republic of Korea.[25]

A key benefit of the APEC regime is that it enables personal data to flow freely even in the absence of two governments having agreed to formally recognise each other's privacy laws as equivalent.

Like the European Union's (EU) General Data Protection Regulation (GDPR), the CBPR also governs the transfer of personal information across the borders of participating nations. However, unlike the GDPR, which is a binding regulation that applies to all EU countries, the CBPR is a voluntary,

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22 *Only Myanmar, Singapore, Thailand and Vietnam have deposited ratification instruments. See http://agreement.asean.org/search/by_pillar/2.html accessed January 3, 2020.*

23 *Cambodia, Lao and Myanmar are not APEC economies.*

24 *The CBPR system uses third-party accountability agents to certify organisations as CBPR-compliant. To date, nine APEC Economies have joined the CBPR system—the United States, Mexico, Japan, Canada, the Republic of Korea, Singapore, Australia, Chinese Taipei and, most recently, Philippines. Singapore is the third member economy, after the US and Japan, to fully operationalise the system. In 2015, APEC developed the Privacy Recognition for Processors (PRP) system, a corollary to the CBPR system for data processors.*

25 *'What Is the Cross-Border Privacy Rules System?' (APEC) <https://www.apec.org/About-Us/About-APEC/Fact-Sheets/What-is-the-Cross-Border-Privacy-Rules-System> accessed 14 September 2020.*

principles-based framework that only extends to APEC members that have formally joined.[26]

APEC does not impose treaty obligation requirements on its member economies. Instead, the cooperative process amongst APEC economies relies on non-binding commitments, open dialogue and consensus. Member economies undertake commitments on a voluntary basis. Consistent with this approach, the APEC Privacy Framework is advisory only, and thus has few legal requirements or constraints.

Under the CBPR, APEC established the Cross-border Privacy Enforcement Agreement (CPEA) as a multilateral arrangement to promote cooperative assistance amongst privacy enforcement authorities. The CPEA creates a framework for the voluntary sharing of information and provision of assistance for information privacy enforcement related activities. Under the CPEA, any privacy enforcement authority may seek assistance from a privacy enforcement authority in another APEC economy by making a request for assistance. The receiving privacy enforcement authority has discretion as to whether or not to provide such assistance.[27]

ASEAN has drawn on the CBPR experience in crafting its own cross-border data flow principles with the objective of ensuring interoperability between the two systems. In crafting new data rules for ASEAN, many of the members have been able to draw upon their past history in working on similar issues in a variety of settings. The Figure below notes the overlapping nature of many trade negotiations in the region. Each negotiation, from the Regional Comprehensive Economic Partnership (RCEP)[28] to the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP) to existing agreements with the

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26 '20181001-Benefits-of-CBPR-System Guide_Oct 2018_final.Pdf' <https://www.crowell.com/files/20181001-Benefits-of-CBPR-System%20Guide_Oct%202018_final.pdf> accessed 14 September 2020.

27 'APEC Cross-Border Privacy Enforcement Arrangement (CPEA)' (APEC) <https://www.apec.org/About-Us/About-APEC/Fact-Sheets/APEC-Cross-border-Privacy-Enforcement-Arrangement> accessed 12 September 2020.

28 RCEP is due for signature in late 2020, at which time the texts and schedules will be publicly released. RCEP has had a chapter on e-commerce which was included quite early on in the negotiations, although the main elements around cross-border data flows and data localisation rules have been largely dropped from discussions as the deal approached the finish line.

EU, includes e-commerce chapters and other types of digital commitments.

Bilateral and Small Group Approaches to Digital Trade

Achieving agreement on rules, frameworks and approaches for managing digital trade has so far been challenging. Unsurprisingly, the larger the grouping, the harder it seems to be to address divergent interests, starting points, and concerns. Hence, governments in Asia have also been actively involved in curating smaller settings to tackle digital trade, either in the context of larger, more comprehensive free trade agreements, or with the creation of "stand alone" digital deals.

While the exact content for these agreements varies, they have similar sets of overall objectives, including: reducing trade barriers to the digital economy; building compatible standards; creating greater regulatory harmonisation so as to facilitate interoperability and trust; encouraging online cross-border consumer trust; and considering innovative regulatory areas for future cooperation.

The most advanced agreements for digital trade in Asia build on commitments made in the CPTPP agreement, which entered into force in late 2018, and includes Asian economies Australia, Japan, New Zealand, Singapore and

Vietnam.[29] Alongside a number of other digital provisions, the CPTPP includes a chapter on e-commerce, with commitments on the free flow of data and a prohibition of data localisation laws.[30]

Australia, New Zealand and Singapore concluded negotiations in 2020 on what are called "digital only" trade agreements. The first, the Digital Economic Partnership Agreement (DEPA), brought Chile together with New Zealand and Singapore.[31] The second, the Digital Economy Agreement (DEA), was designed by Australia and Singapore to be slotted into an existing bilateral free trade agreement.[32]

The content of these latest trade agreements highlights the shift in focus from early e-commerce chapters that were largely confined to urging the use of electronic signatures and providing for key government processes, such as customs documentation, to be migrated online. However, the DEPA and DEA go much further, and include commitments that extend far beyond data flows or data localisation to include topics such as AI, electronic invoicing and e-payments.

The DEPA was deliberately designed as a "modular" agreement, meaning the parties involved explicitly worked on the agreement as a series of different components covering a range of digital issues. These could then be picked up and slotted into other types of trade arrangements by other parties in the future. The use of similar provisions in an ever-expanding set of countries is meant to ensure greater alignment around the modular approach, but also to allow countries to pick and choose modules and provisions which are seen as most appropriate for any specific set of domestic conditions. Countries desirous of more advanced commitments may opt for transferring the entire set of modules or even expanding upon them, either adding

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29 *Brunei and Malaysia have signed the agreement, but have not yet completed domestic procedures to bring it into force.*

30 *Subject, of course, to some caveats and exceptions. See the e-commerce text here: https://www.mfat.govt.nz/assets/Trans-Pacific-Partnership/Text/14.-Electronic-Commerce-Chapter.pdf*

31 *The DEPA text is available at: https://www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-concluded-but-not-in-force/digital-economy-partnership-agreement/depa-text-and-resources/*

32 *The DEA text is available at: https://www.dfat.gov.au/sites/default/files/australia-singapore-digital-economy-agreement.pdf*

additional information to the modules or converting the softer legal language ("members shall endeavour") to harder legal commitments ("members shall"). Conversely, those less ready to adopt the entire set of modules are able to include only those elements which they may deem appropriate.

The DEPA's dozen modules range from digital trade facilitation commitments around electronic documents, to electronic invoicing, to electronic payments. Module 4 covers data issues, including the establishment of a framework for the protection of personal data, allowing members to maintain cross-border data flows as long as the information is for a business purpose, and a data localisation section that explains that data hosting requirements cannot be a condition for conducting business. In each section, the agreement spells out in greater detail the circumstances under which members might pursue inconsistent policies.

The current DEPA members are also CPTPP members, which means that the CPTPP's more expansive rules on data flows and prohibition on data localisation apply; future DEPA members or countries that insert Module 4 into other agreements may not have similar existing data pledges already in place.

The DEA is more ambitious, overall, in coverage than DEPA. This is because Australia and Singapore were also CPTPP members and both sides wanted to build upon, and go beyond, existing commitments. The DEA is also designed to be incorporated into a past bilateral trade agreement rather than follow the DEPA modular format.

Nevertheless, many of the DEPA modules are consistent with the DEA. On cross-border data flows, the DEA Article 23 replicates the DEPA commitments in module 4. DEA Article 24 also replicates the DEA on data localisation requirements, although it adds an additional clause on hosting data for financial institutions and financial services suppliers.

Circling Back to Global Digital Rules

The digital economy has been largely built for a world without borders. Given the lack of global trade rules in place to constrain, restrain, or focus digital trade, the digital economy has been able to flourish.

This situation, however, is growing increasingly problematic. Governments

are growing concerned about the size and dominance of the digital economy, and its potential for unfavourable side effects. However the creation of isolated rules to tackle specific challenges in domestic economies is also not an ideal outcome. Firms built for a global digital platform, including both giant and tiny firms, will struggle to navigate a world of fragmented regulations and laws. Consumers may find fewer choices in a divided world, or at higher prices. The bright future of digital trade, and the promise of a more deeply interconnected world, may never arrive if the regulatory and policy frameworks become hostile or increasingly challenging to navigate.

Governments are therefore faced with the prospect of trying to quickly craft rules to govern digital trade, even as digital applications and innovations continue to be developed at rapid, or even exponential, rates. The experience of past trade rules suggests that regulations may need to function for the medium to long term before they are updated and adapted to better suit the conditions of the future. This is a very complex task — to create rules to govern digital trade that do not unduly hamper current or future pathways, while constraining particular outcomes that governments view as undesirable.

Getting acceptable outcomes in place with 164 members in the WTO will be especially difficult. The gaps between members across the full membership are substantial, and their attitude to the digital sphere varies significantly.

Hence, it is more likely that smaller coalitions of members will continue to craft sets or subsets of rules and regulations to govern various aspects of digital trade. Governments in Asia that have consistently been at the forefront of creating new digital frameworks will likely continue to lead the way in this "bottom up" approach to creating digital rules that cover larger portions of the digital economy.

The experiences of Asian governments in creating rules for just two elements of digital trade— namely, cross-border data flows and data localisation — suggest the pathways forward. New norms, rules and even complete mechanisms or frameworks can be created in one setting, such as APEC, ASEAN, or within the context of regional or bilateral trade arrangements, and then spread to other environments. Eventually, many of the specific negotiated commitments may be adopted by more and more groups, and eventually become organically embedded in the rulebook of global trade.

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The Impact of Digitalisation in Trade Patterns of South Asia

Aashiyana ADHIKARI

Impact of Digitalisation in Trade Patterns of South Asia

Aashiyana ADHIKARI[1]

The centre of gravity of the world economy is shifting eastwards as advanced economies are going through slow-downs. With the increased availability of the internet to the developing region of South Asia, middle class consumers are gaining access to virtual market places, resulting in trade volume growth.

Digitalisation has changed how South Asians trade goods. The gradual growth of online platforms in the region has led to a rising number of goods and services being sold across the world. Firms, notably small- and medium-sized enterprises (SMEs) have started using new and innovative digital tools to overcome barriers to growth, helping facilitate payments, enabling collaboration, and using alternative funding mechanisms, such as crowd funding.

Although, digitalisation increases the scale, scope and speed of trade, a report by the World Bank in 2017 mentioned that only 30 per cent of people in South Asia had access to the internet. While this percentage has increased in the last three years, issues related to connectivity, reliability and speed remain. As, information and communications technology (ICT) services form the backbone of digital trade, lack of the necessary network infrastructure hinders the growth of such services.

Via usage of online trading platforms more firms have been able to participate in international trade fairs, and sell their products to a larger market. Yet, the region's hinterlands still lack access to the products and services these firms offer. With 309 million people living on less than USD 1.90 a day — the largest concentration of poverty in the world — inadequate infrastructure, added to a lack of political commitment to find common solutions to support cross-border commercial activity, has largely affected the growth of trade through digitalisation.

This paper shall delve into the contradictory scenario that the emerging digitalisation of trade has brought to South Asia. It shall further examine the

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nature of this trend and consider which changes are needed to help policy-makers create an environment that nurtures innovation, and promotes digital trade in goods and services.

Keywords *: South Asia, Trade, Digitalisation, Digital Trade*

Introduction

For the past few years Asia has been changing its face — from being a digital factory, reliant on cheap labour, into a digital hub, reliant on creative industry. Asia currently holds about 60 per cent of the world's population, which certainly suggests great potential as regards growth and innovation. The region's new generations of digital natives are forerunners who could herald a new era of innovative advances, and exposure to global influence and dynamic cultures, long past the days of information being exclusively controlled by a single source (Huang, 2017).

A number of factors are rapidly reshaping Asian economies, including: the rise of the digital economy; strong growth rates; automation; increased urbanisation; the growth of the middle class; and increased purchasing power. Similarly, South Asian countries are embracing the digital trade culture and the e-commerce sector, and are developing the necessary infrastructure to support digital growth. Among South Asian countries, India has emerged as one of the biggest markets, with a size of around USD 20 billion for e-commerce companies (Choudhury, 2020). The digital payment system is also expanding at a very fast pace in the region. Both domestic and international start-ups, along with established companies, are joining the digital bandwagon, setting up easier digital payment gateways for trade and business.

However, some countries of the region remain at an incipient stage, for instance in countries such as Nepal and Sri Lanka, the culture of online trade isn't developing at a similar pace to that of their neighbouring countries. This is due to an underdeveloped digital payments infrastructure, and a weak logistics framework (Huang, 2017). Due to these digital and logistical shortcomings there are only few players present in the Nepali and Sri Lankan online space. Those hopeful of starting an e-commerce business either fail, or are struggling to make ends meet. There are a few home-grown brands, and Asian e-commerce giants, such as Daraz. However, global e-commerce players, such as Amazon or Alibaba, are absent from these countries.

According to Choudhury (2020), India is the leading nation in e-commerce amongst South Asian countries. It boasts domestic startups, such as Snapdeal, as well as international players, such as the Singaporean Flipcart and American Amazon. Meanwhile, Bangladesh isn't far behind in terms of digital trade, with 700 e-commerce sites, and around 8,000 e-commerce pages on Facebook.

While e-commerce companies are developing their infrastructure and spreading awareness among consumers (Choudhury, 2020), mere access to digital networks does not ensure their effective use. Policies are needed to help equip workers and citizens with appropriate skills to use the technology; to enable complementary investments in organisational change and process innovation; and to foster competition and sound firm dynamics.

In the global and interconnected digital environment, the lack of an integrated, whole-of-government approach increases the risk that policies in one area will have unintended, possibly adverse, impacts on another, or that opportunities for synergies that enhance positive effects may be missed (Pilat, 2017). Thus, although there has been significant development in this sector, lack of regulated policies have become a major hindrance of South Asian digital growth. A particularly crucial point is the need to build, improve and strengthen digital infrastructure. This is especially necessary in smaller countries, such as Nepal and Sri Lanka. The growth rate among individual countries in this region varies widely. As per Choudhury (2020), India with its advanced technology, and larger, more mature market has been able to grow swiftly, while others remain far behind. Internet speeds are another issue. Their levels are far from satisfactory in the region, and many rural parts of some countries do not even have access to the internet at all, which acts as a very basic impediment for the growth of digital trade.

Digital Trade in South Asia

At the end of 2019, a total of USD 3.46 trillion had been spent globally by online retail consumers (Perego, Kathuria,Grover, & Matto, 2019). E-commerce can be a powerful force, not only for driving the economic growth of a country, but also that of the region as a whole. Perego (2019) notes that online commerce also helps to render the international trading system as a whole more inclusive; it enables businesses, regardless of their size or domestic share, to access new markets, and gives even remote consumers access to a

broader range of goods. In this manner, online trading has been connecting buyers and sellers, who are separated by geographical distances and logistical barriers, very smoothly.

In South Asia, digital trade has grown substantially in recent years, with both online retail (e-tailing) and online travel services gaining momentum (World Bank, 2019). But although e-commerce has grown significantly in South Asia, a 2019 World Bank report on Unleashing E-commerce for South Asian Integration states that online sales accounted for a mere 1.6 and 0.7 per cent of total retail sales in India and Bangladesh, compared to 15 per cent in China, and around 14 per cent globally. Hence, despite its high growth potential, e-commerce in this region remains far below its potential. In a 2018 survey of more than 2,200 internet-connected firms in South Asia (South Asia E-Commerce Development Survey), more than a third of the sample reported neither selling nor buying online (Perego, Kathuria, Grover, & Matto, 2019). This shows that some parts of this region still remain at a developing stage.

However, the widespread use of social media platforms, such as Facebook and Instagram, is transforming the region's e-commerce landscape, especially for SMEs (Huang, 2017). These platforms offer opportunities for traders to tap into a market of consumers who have limited access to developed payment systems and shipping services. Huang (2017), also adds that the strong market position of Facebook among a young population has made C2C (customer to customer) and B2C (business to customer) transactions easier.

Despite the increasing growth of such transactions, huge differences remain in the e-commerce market of South Asian countries. As per Choudhury (2020), one such major difference is control of the market. Aside from India, and to some extent Sri Lanka, all other markets are controlled by foreign players. Beyond differences between South Asian countries, there are also huge differences within each country. This is generally related to the breadth of mobile and internet penetration within each country; the weaker the infrastructure, the less developed the e-commerce industry. A survey done by Lirne Asia, an ICT research firm pointed out that the rural and urban poor gap in mobile phone ownership in Pakistan is 5 per cent, 22 per cent in India, 15 per cent in Nepal, and 7 percent in Bangladesh. The gender gap in internet usage, meanwhile, is 14 per cent in urban India, and 27 per cent in rural areas (Pt Profit, 2018).

Table 1: Major Indicators of E-Commerce Industry in South Asian Countries

Indicators	India	Pakistan	Bangladesh	Sri Lanka	Nepal
Smart Phone Users (million people)	777.5	152	155.8	NA	NA
Mobile Penetration (percentage %)	87.2	73	87	N/A	N/A
Internet Penetration (percentage %)	34.4	17.8	13.2	29.3	17.2
Credit and Debit card Users (million people)	1021	37	13	20	5.2
Cash on Delivery (percentage %)	74	95	90	96	96
Cost of Mobile Data per GB (USD)	0.096	7.5	0.39	0.03	0.55
Volume of Online sales (USD)	14.5	0.15	0.12	0.17	N/A

Source: E-commerce and Developing Countries: The South Asian Experience (2020) by Rahul Choudhury, retrieved from https://etradeforall.org/e-commerce-and-developing-countries-the-south-asian-experience/

As illustrated by this table, in developing countries like Sri Lanka, Bangladesh, and Pakistan, the volume of online sales only comprises USD 0.17, USD 0.12 and USD 0.15, respectively. These figures are particularly low, especially when considering the high mobile penetration in these countries. But the above data also shows that despite high mobile penetration rates, the internet penetration rate in these countries is low.

Similarly, based on a 2017 survey, conducted by the World Bank in India, Nepal and Sri Lanka, it was found that key constraints to cross-border e-commerce included inadequate logistics and connectivity, payments restrictions, and digital regulations (World Bank, 2019). The survey further reported that

removing regulatory and logistical challenges to e-commerce would increase exports, employment, and productivity of SMEs by as much as 20-30 per cent.

These barriers are higher when trading within South Asian countries rather than when South Asian countries trade with those outside the region. As such, the main international e-partners of firms in South Asia are China, the United Kingdom, and the United States, and not other South Asian countries, despite their geographical and cultural proximity (Perego, Kathuria, Grover, & Matto, 2019). Much work is needed to provide an effective regulatory framework for e-commerce. This would promote cross-border trade within the region, maximising economic gains, and thereby generating positive social impact.

Current Scenario of Digitalisation in South Asian Countries

Nepal currently has a mobile penetration exceeding 100 per cent, and an internet penetration reaching 60 per cent. According to the Nepal Telecom Authority, an additional 2.25 million internet users were generated in 2017 alone, translating into approximately 250 new internet users every hour. Nepal is expected to lead internet penetration by 2025, as compared to its two neighbouring countries — India and China. The growing popularity of social media is a crucial factor for this growth, with Nepal coming second only to Bhutan in South Asia in terms of social media penetration.

In India, the present Narendra Modi government has put significant focus upon the 'Digital India' initiative, which includes scaling-up mobile payments and introduces the concept of paper-less government. In 2015, the Indian government launched a campaign to ensure government services were made available to citizens electronically, drastically improved online infrastructure, and gave particular priority to e-commerce development.

In Pakistan, the Imran Khan government has vowed to digitalise the entire country, and is working to "create an e-governance system to bring down corruption, to ensure accountability process and also to augment the productivity in the country. The government has been taking great strides in the advancement of technology — from the Mohafiz app to digitizing the Postal service and the introduction of Tax Asaan mobile app which provides taxpayers with quick access of verification features like active Taxpayers list (ATL), NTN/STRN inquiry and exemption certificate etc. and many more. The PTI government has been proactive in the inclusion of technology within various segments and has also launched the online FIR system where people

can submit their complaints online, and will be facilitated by government officials."[2]

Bangladesh has 16 per cent of the world's online workers, which ranks it second after India, with 24 per cent. There are half a million active online freelancers. This technology-driven, skills-based digital economy has transformed Bangladesh; the country is now poised to become a middle-income country. Hurdles in the path of the realisation of a fully digitalised economy are, however, significant. They include: power shortages; high data prices; lack of quality internet connections; deficient telecommunications infrastructure; inefficient trade logistics; lacking digital payment solutions; unhelpful laws and regulations; lacking skills development; and insufficient financing.

Impact of Digitalisation in SMEs

SMEs provide the largest share of employment after agriculture in Asia, and have the potential to provide jobs to millions of unemployed youths (WUSME News, 2016). According to Pilat (2017), digitalisation is particularly helpful to SMEs in overcoming barriers to growth. This is because digitalisation facilitates payments, enables collaboration, results in less investment in fixed assets through the use of cloud-based services, and makes alternative funding mechanisms (e.g. crowdfunding) available. Establishing an online presence has helped SMEs to further develop and increase their outputs, and has helped them to acquire new clients in both domestic and global markets (SME Venture, 2019).

Online shopping's success in becoming a strong competition to shopping in physical stores in the South Asian market can be attributed to emerging sophisticated payment systems and efficient logistics networks. Some of the major online marketplaces allow users to create accounts with value on the platform itself, so that payments are not delayed while waiting for bank clearance, allowing goods to be delivered faster (Voice of Asia, 2017).

Although SMEs in South Asian countries have a huge opportunity to grow, access to finance has become a major reason behind their slow and low growth. Ever-changing customer demands, competitive pressures, and

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2 *'The need for Pakistan's Digitalization Policy' https://moderndiplomacy.eu/2020/05/24/the-need-for-pakistans-digitalisation-policy/ assessed on Oct. 6, 2020*

a scarcity of resources also constitute major challenges for SMEs. But the bottlenecks have reduced significantly over the years due to the recent growth of Information Technology (IT) and Information Technology Enabled Services (ITeS) (Maiti & Kayal, 2017).

While most SMEs in the region have embraced digitalisation, hurdles such as lack of digital skills and talent, lack of insights into operational and customer data, along with an insufficiently robust IT platform, slow this transformation (Tongwaranan, 2019).

Challenges to Digital Trade in South Asia

While digital transformation has brought many benefits to South Asia, there are still considerable challenges, which the region must tackle in order to achieve faster progress in its growing digital economy. For instance, although progress has been made on digital connectivity in terms of mobile/cellular, fixed broadband, and internet penetration, these developments have neither been uniform across the region, nor within countries, nor between urban and rural populations (Park, Khan, & Gusto, 2017). Due to this unequal digital connectivity, a digital divide is emerging within the region.

Another major challenge for South Asia with regard to increased digitalisation is the loss of traditional jobs. Although digital technologies help cut costs, enable delivery of services without leakages, reduce opportunities for graft, promote ease of doing business, leverage an increasingly non-tactile world, grow economies, and have the potential to create millions of new jobs (Joshi, 2019), there are also negative elements to be considered. The cost of the emerging digital economy is felt in terms of loss of traditional employment sectors, an erosion of the right to privacy, an increase in authoritarian state-control of citizens' lives, spikes in cyber crime, and, according to some, the promotion of a deracinated, atomised existence for human beings.

South Asian public administration is resistant to drastic change, and has only slowly been adapting to the usage of new technologies. Government offices in South Asia still often only accept paper documents, written applications, files and letters. This is, however, fairly understandable given the unreliability of internet connectivity. The land revenue offices in certain rural Nepalese districts, for instance, have gone digital but when the internet server goes down for several days, the officials cannot automatically switch back to old methods of written work. Other departments, such as immigration, passport

and tax collection, face the same issues. Internet connectivity is not reliable in many countries of the region, and servers can be disrupted for long periods of time, often meaning government work is disturbed for several days.

The policy responses to the digital transformation have been mixed — this is true across South Asia, as it is globally. According to a report published by the OECD Southeast Asia Regional Forum (2017), some countries are developing a strategic and proactive approach to leveraging the benefits of digitalisation, working across the full range of government policies. Others have made gradual decisions to contain the consequences of specific incidents (e.g. security breaches) or the impacts of new technologies, applications or business models.

Inclusiveness is one of the core challenges for countries in this region with regard to the formulation of digital strategies. Skills and capacities are unevenly spread across the region, and within countries. Hence, in the global and interconnected digital environment, the lack of an integrated, whole-of-government approach increases the risk that policies in one area will have unintended, possibly adverse, impacts on another, or that opportunities for synergies that enhance positive effects are missed (Pilat, 2017).

India is one of the largest markets for e-commerce in South Asia, with considerable growth prospects and human capital; so far, it has not yet reached its potential due to weak policy and unsystematic management. The 'Digital India' initiative is a good start, but still necessitates much improvement. This is true in spite of advantages, such as high-quality, digital-ready and trained manpower. Joshi (2019) states that the poor, albeit improving, digital ecosystem, and an underwhelming record in project implementation are amongst the main issues holding it back.

Similarly, in Bangladesh, digital technologies are being promoted in the scope of Vision 2021 (commonly called Digital Bangladesh). The goal of this policy is for the country to achieve the level of a middle-income country, 50 years after its independence. There is, however, concern that the journey ahead will not be a smooth one (Rahman,2015). In addition to the country's turbulent political situation, the crucial hurdle to effective digitalisation is the digital divide between rural and urban areas within the country.

The situation remains that despite a great many years of growth, none of the South Asian countries has been able to develop a comprehensive policy to regulate the digital industry, and to safeguard the interests of buyers

and sellers (Choudhury, 2020). In countries like Nepal, Pakistan and Sri Lanka, a great deal must be done to strengthen the digital infrastructure. Basic infrastructures required for the development of digital trade, such as internet access and effective payment gateways are not available across all areas within these countries. Similarly, the lack of a regulatory framework for digital trade within and across the region is a major hurdle..

Way Forward

In the era of globalisation, the opportunities for cross-border online trade within and outside the region are significant. Cross-border e-trade is already occurring informally, and there are many high-demand products that could easily be traded online by South Asian firms, for instance those that bundle goods with strong services, such as design, after-sales services, entertainment, or products that can be customised to local tastes (Perego, Kathuria, Grover, & Matto, 2019).

Governments in this region should establish the framework, both infrastructural and regulatory, for greater connectivity, as it is the backbone of the digital economy. Half of the region's population has access to the internet — a figure on par with the global average — however, this figure can still expand with policies and actions to lower prices, increase speeds, and bring reliable broadband internet to under-served areas (World Bank, 2019). Differences within countries in this region in the uptake of digital networks can be attributed to factors such as age, education and income levels. Providing universal access to digitalisation would thus enable people across Asia, especially those in rural areas and in disadvantaged groups, to benefit from e-commerce (Pilat, 2017).

However, although access to digital networks provides the basic foundation for the digital transformation of both economy and society, it does not ensure that the technology will be used effectively. To this end, educational policies are required to train effective and efficient use, so that people may benefit from access to technology. People should be informed about the opportunities offered by the digital transformation, and their skills should be developed so as to ensure the region is able to keep pace with the changing dynamics of digitalisation. Educational systems will have a key role to play in developing the technical knowledge and soft skills that are required to compete in the global digital economy (World Bank, 2019).

Another essential component that must be established to facilitate digital trade in this region is digital payments. Digital money is very infrequently used in South Asia, where 'cash on delivery' is the prominent model in the e-commerce sector, and therefore only a limited number of consumers prefer digital transactions. Consumers should therefore be encouraged by government through policies and plans to use more digital modes of payment, such as credit and debit cards, and digital wallets for their online transactions. This would not only will help nations to move ahead digitally, but also reduce the cost burden for e-commerce traders, as their payment would no longer be blocked for longer periods of time (Choudhury, 2020).

The changing digital trade pattern of the region affects all corners of the economy, society and government. To access the full benefits of the digital transformation, governments needs to reach across traditional policy silos, as well as across different levels of government, in order to develop a whole-of-government approach to policy making (Pilat,2017). This means they should co-ordinate actively with all key stakeholders, including the business community trade unions, civil society and the internet technical community when making and implementing policy measures across ministries.

Governments should also develop sound policy frameworks in collaboration with effective telecommunications services in order to engender the requisite wide diffusion of digital networks to all individuals and businesses at an affordable price. Additional measures, such as national broadband strategies, should also be implemented, particularly with regard to connecting disadvantaged groups, firms and rural or remote areas.

According to Pilat (2017), for firms, notably SMEs, a wide range of factors needs to be addressed. These include: skills development; complementary investments in knowledge-based capital, including data, organisational capital and process innovation; sound competition and firm dynamics; finance, taxation and regulation. Ensuring sound competition, including market openness, is the key to develop this area.

By identifying the key policy spheres affected by the digital trade transformation, it will be easier for relevant cross-regional ministries and government bodies to connect and coordinate. Regional integration can play a role here. In this manner, digital trade policies can be crafted in such a way that they are mutually reinforcing and aligned in the context of a single, coherent and strategic regional digital agenda.

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7

Digital Infrastructure Development along the Digital Silk Road: **How to Balance Digital Trade and its Security Risks**

Younkyoo KIM

Digital Infrastructure Development along the Digital Silk Road: How to Balance Digital Trade and its Security Risks

Younkyoo KIM

China's vision for the Belt and Road Initiative (BRI, formerly known as One Belt, One Road or OBOR), is not limited to the mere conventional realms of natural resources and physical connectivity. In addition to the conventional infrastructure projects for which it has become known, such as railways, energy pipelines, and highways, the BRI also aims to digitalise the route. Opinions on the BRI's international implications are significantly polarised. China's Digital Silk Road (DSR) is fostering an even bigger controversy surrounding the digital infrastructure-induced development in Asia, Europe, and Africa. Digital trade and e-commerce has been expanding in DSR countries.[1] China aims to expand its idea of "internet sovereignty," a Chinese-style internet governance, at odds with the ideal of the internet as an open forum for many countries. There are increasing fears that Chinese digital companies use their infrastructure to aid the Chinese government's intelligence efforts. The digital infrastructure element has been largely overlooked in the BRI literature. Based on the scant literature available on the DSR, the aim of this report is to delimit and characterise the current state of digital connectivity under the DSR from Asia to Africa, and to suggest that unlike trade in traditional hard goods and services, the rules governing digital trade in the global marketplace are not yet written.

Digital Infrastructure Development under the DSR

The Digital Silk Road (DSR) was first mentioned at the "Information Silk Road" in March 2015 in a white paper jointly issued by China's National Development and Reform Commission (NDRC), Ministry of Foreign Affairs and Ministry of Commerce. In 2016, China's State Council issued the 13th Five-Year Plan, which dedicates a specific section on improving internet and telecommunications

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1 *Hong Shen, "Building a Digital Silk Road? Situating the Internet in China's Belt and Road Initiative," International Journal of Communication 12(2018), 2683–2701; Bora Ly, "Challenge and perspective for Digital Silk Road," Cogent Business & Management, 7:1(2020), 1-19 (https://doi.org/10.1080/23311975.2020.1804180); Michael Keane, "A Digital Empire in the Making: China's Outbound Digital Platforms," International Journal of Communication 13(2019), 4624–4641.*

links across BRI countries. In particular, the five year plan emphasises the creation of land and sea cable infrastructure, an Internet Silk Road between China and the Arab States, and the creation of a China-ASEAN information harbour. The International Cooperation Forum on the Digital Silk Road was held on December 4, 2017 as part of the 4th World Internet Conference in Wuzhen, East China's Zhejiang province, with Chinese government officials, overseas dignitaries and tech heavyweights discussing the challenges and solutions for the digital future. Two years on, President Xi Jinping's speech at the Second BRI Forum in April 2019 spoke of cooperation in the digital economy and innovation-driven development as priority areas for the BRI.[2] With the COVID-19 outbreak continually pushing economic activities and consumption patterns online, this emphasis has only increased. China is thus focussing on the non-physical components of the BRI, namely the Health Silk Road (HSR) and the Digital Silk Road (DSR).[3]

A key thrust of the DSR is to ensure that leading Chinese platform players, such as Alibaba, Tencent, and Baidu—as well as Huawei and state-backed telecom carriers, such as China Mobile, China Telecom, and China Unicom—can take advantage of the DSR umbrella and market access provided by BRI projects to compete against leading US companies in emerging markets in so-called over the top (OTT) services.[4] It can be challenging to define the parameters of the Digital Silk Road. There is no central database that neatly designates digital infrastructure projects across regions under different categories, such as improving internet infrastructure, deepening space co-operation, developing common technology standards, launching 5G telecommunications, and laying submarine fibre-optic cable connectivity.[5]

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2 *Thomas S. Eder, Rebecca Arcesati, and Jacob Mardell, "Networking the "Belt and Road" - The future is digital," August 28, 2019, MERICS (https://merics.org/en/analysis/networking-belt-and-road-future-digital)*

3 *Pradumna B. Rana and Xianbai Ji, "Reviving Stalled BRI: China's Two-Stage Approach," RSIS Commentary, No. 084, May 5, 2020, Singapore: the S. Rajaratnam School of International Studies, Nanyang Technological University (https://www.rsis.edu.sg/wp-content/uploads/2020/05/CO20084.pdf)*

4 *Eurasia Group, "The Digital Silk Road: Expanding China's Digital Footprint," April 8, 2020 (https://www.eurasiagroup.net/files/upload/Digital-Silk-Road-Expanding-China-Digital-Footprint.pdf)*

5 *Jeremy Page, Kate O'Keeffe, & Rob Taylor. "America's Undersea Battle With China for Control of the Global Internet Grid." Wall Street Journal, March 12, 2019.*

According to the Mercator Institute for China Studies (MERICS) BRI Tracker database[6], digital infrastructure under the DSR covers, inter alia: cables and network equipment, 5G infrastructure, data and research centres, smart city projects, as well as large e-commerce and mobile payment deals.[7] Chinese entities have provided over 17 billion USD for DSR projects completed since 2013, of which: 7 billion USD in loans and foreign direct investment (FDI) for fibre-optic cables and telecommunications; more than 10 billion USD for e-commerce and mobile payment deals; at least several hundred million USD for smart and safe city-related projects; and the remainder for data centres.[8]

In the two-year period from 2017-2019, China signed memoranda of understanding on cooperation in strengthening the digital economy with sixteen countries. The goal being to jointly build the DSR, with Egypt, Laos, Saudi Arabia, Serbia, Thailand, Turkey and the United Arab Emirates among the founding members. These initiatives purported to strength cooperation on the digital economy, in areas such as telecommunications, digital infrastructure, e-commerce, smart cities, big data and mobile payments.

The lifelines of the modern digital economy are undersea fibre-optic cables, which according to estimates carry more than 98 per cent of international internet, data, and telephone traffic.[9] Back in the 1850s, the British controlled the undersea cable market for the telegraph, and also determined the standards to be met by companies from other countries. Today, the bulk of these cables are both geographically concentrated and largely dominated by the US, which has raised concerns in Beijing about data security.[10]

China has significant interests in cable infrastructure to meet its connectivity demands and to increase connectivity in other emerging markets. Currently,

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6 Eder, Arcesati, and Jacob Mardell, Op. cit.

7 See also Brigitte Dekker, Maaike Okano-Heijmans, and Eric Siyi Zhang, "Unpacking China's Digital Silk Road," Clingendael Report, July 2020, Netherlands Institute of International Relations, pp. 5-6.

8 Eder, Arcesati, and Jacob Mardell, Op. cit.

9 Geostrategy Platform, World Economic Forum, "China is building a new Silk Road, and this one is digital," August 18, 2018 (https://www.weforum.org/agenda/2018/08/china-is-building-a-new-silk-road-and-this-one-s-digital/)

10 Ibid.

inter-continental digital connectivity occurs through underwater fibre-optic cables.[11] According to the Chinese Ministry of Industry and Information Technology (MIIT), only ten international submarine cables connect to mainland China, lagging far behind advanced economies like the US (80 submarine cables) and Japan (23 cables). In 2017, China's total international bandwidth (including submarine and terrestrial cables) was 7.3Tbps, which on a per capita basis was less than one-twentieth that of the United States'. China's 13th Five-Year National Information Plan (2015-2020) aims to increase the country's total international bandwidth to 20Tbps by 2020. The BRI, announced in 2013, also pledges to support cable development as part of the 21st Century Maritime Silk Road. Twelve new cable systems, either completed or with contracts in force since 2014, have received Chinese investment. Emerging markets show rising importance in the geographic distribution.[12]

Table. 1. Comparison of Submarine Cables between China and Major Countries

	China	US	Japan	UK	Singapore
Number of submarine	10	80	23	53	24
Total International bandwidth in 2017 (Gbps)	43445	201527	38799	151066	46544
Per capita international bandwidth (Mbps)	0.031	0.618	0.306	2.289	8.297

Source: China Academy of Information and Communications Technology (CAICT), White Paper on China International Optical Cable Interconnection. August 2018, p. 15.

11 *Sanchita Basu Das, "OBOR's Digital Connectivity Offers Both Benefits and Risks," August 4, 2017, ISEAS – Yusof Ishak Institute, Singapore.*

12 *Yujia He, "Connecting the Emerging Markets: China's Growing Role in Global Digital Infrastructure," HKUST IEMS Thought Leadership Briefs No. 26, April 2019 (https://iems.ust.hk/assets/publications/thought-leadership-briefs/tlb20/tlb26/hkust-iems-tlb26-he.pdf)*

From Africa to Asia

Developing countries have been the focus of Chinese information and communication (ICT) groups expanding abroad since the late 1990s. The DSR has helped over 6,000 Chinese internet enterprises and 10,000 technology products to move into overseas markets since 2015.[13] In 2015 and 2017, after the DSR was announced, Chinese ICT infrastructure financing across the African continent surpassed the combined funds from African governments, multilateral agencies, and G7 nations. Chinese-built fibre-optic cables also increased digital connectivity in landlocked Central Asia.[14] The Chinese government is positioning itself as a leading player in digital development – one able to advance the United Nations' ambitious Sustainable Development Goals (SDGs). China is promoting the DSR as a development concept in its own right.[15]

A recent report by Chatham House, a British foreign policy think tank, noted that Chinese firms are already making significant inroads into North Africa.[16] Huawei opened its first cloud data centre in Egypt in February 2019. Tangier Tech, Morocco's much publicised Chinese-built smart city is expected to host 200 Chinese companies, many of which operate in high tech activities. In Tunisia, Chinese firms are actively participating in infrastructure improvements and technological development to fulfil the goals set out in the country's 'Digital Tunisia 2020' strategy.

Middle Eastern e-commerce is likely to be worth in excess of 50 billion USD by 2020. In the Gulf, the UAE has established a 10 billion USD joint strategic investment fund between the Abu Dhabi investment group Mubadala and the China Development Bank. The Internet of Things and blockchain technologies are central to the 'Smart Dubai 2021' project — technologies in which China currently plays a leading role. Meanwhile, Alibaba, the Chinese online retail platform, has pledged to build a 'Tech Town' with Dubai developer Mereas Holding, which will house over 3000 high-tech companies near Dubai's Port,

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13 *Jia Hao Chan, "China Accelerates in Tech Race with US," OMFIF, July 9, 2020 (https://www.omfif.org/2020/07/china-accelerates-in-tech-race-with-us/).*

14 *Arcesati, Op. cit.*

15 *Ibid.*

16 *Belt and Road News, "China's Global Digital Silk Road is arriving in the Middle East," September 16, 2019.*

Jebel Ali.[17] In the field of financial technology, Chinese giants Alipay and WeChat Pay are widely accepted in the region, and forming partnerships with Middle eastern tech firms and financial institutions. Additionally, the expansion of so-called fintech infrastructure is helping to internationalise the Renminbi, China's currency, as well as its economic institutions.

Southeast Asia and India are at the heart of US-China digital geopolitical rivalry. As China's relative power has increased — an increase enabled by technology — so too has its desire to become the region's hegemon. The US has been watching China steadily increase its digital economic influence in the region. Geographically, Southeast Asia is at the heart of the competition between the US and China. The US administration looks to compete with, not contain, China. Its aim is to offer an appealing vision to Southeast Asian countries, which might make them willing to adopt American norms and standards.[18] Collectively, the Association of Southeast Asian Nations (ASEAN) is ranked third in terms of population, sixth with regard to Gross Domestic Product (GDP), and fourth in trade value. These countries are preferred by investors looking for the next unicorn. ASEAN must embrace the digital revolution, which has thus far taken the world by storm. ASEAN's digital economy is only seven per cent of its current GDP. Comparatively, China is at 16 per cent, while the US is at 35 per cent.[19] Digital integration could boost ASEAN's combined economy by 1 trillion USD before 2025.[20] ASEAN is the world's third largest region for internet users. Its internet economy is set to quadruple in value from 50 billion USD in 2017 to 200 billion USD in 2025. The three largest markets there are those of Indonesia (261.1 million people), the Philippines (103.3 million people) and Vietnam (92.7 million people), and they make up 70 per cent of the ASEAN citizenry.[21]

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17 *Ibid.*

18 *Simone McCarthy, "Can China outsmart the United States in the race to build smart cities in Southeast Asia?" South China Morning Post, November 25, 2019.*

19 *Angaindrankumar Gnanasagaran, "The Key to Greater ASEAN Digital Integration," ASEAN Post, September 10, 2020.*

20 *Ibid.*

21 *The ASEAN Post Team, "Chinese Tech Giants Scramble for Southeast Asia." The ASEAN Post, September 18, 2018.*

There are approximately 7,000 start-ups in the region offering a myriad of technology-based services including e-commerce. Indonesia has recently emerged as a hotbed of start-up activity, having already produced five unicorns – firms valued at 1 billion USD or more.[22] Chinese investment in Southeast Asian start-ups ballooned to 1.78 billion USD in the first seven months of 2019, an eightfold increase over the same period in 2018.[23] Alibaba and Tencent have been investing ferociously in Southeast Asia – each eating up local e-commerce start-ups and increasing their equity in existing ones. Alibaba has mainly cemented its grip on the e-commerce market with investments in the Singaporean company Lazada, and its Indonesian rival, Tokopedia. It has also extended its influence via joint ventures and technical cooperation with the governments of Thailand and Malaysia, leading to the creation of digital free trade zones and e-commerce hubs in these countries.[24] These giants view expansion to Southeast Asia as a potential remedy to declining income in mainland China. Southeast Asia is one of the fastest growing regions in the world and home to an economy worth over 2.5 billion USD – roughly 20 per cent the size of China's. As such, it may just be the next battleground for these two tech titans.[25]

ASEAN and China agreed on Nov 3, 2019 to facilitate regional all-round connectivity by dovetailing development plans and jointly building a smart cities network across the region. The two sides issued a joint statement on synergising the Master Plan on ASEAN Connectivity (MPAC) 2025 and the Belt and Road Initiative (BRI) at the 22nd ASEAN-China summit, a major step in the implementation of the landmark China-ASEAN Strategic Partnership Vision 2030, adopted in 2018.[26] Both sides issued a leaders' statement on

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22 *Ibid.*

23 *Dewey Sim, "How Chinese money is driving Southeast Asia's tech start-up scene," South China Morning Post, October 6, 2019.*

24 *The ASEAN Post Team, Op. cit.*

25 *Ibid; Barry Naughton, "Chinese Industrial Policy and the Digital Silk Road: The Case of Alibaba in Malaysia," Asia Policy, Vol. 15(1) 2020: 23-29; K.C. Fung, Nathalie Aminian, Xiaoqing (Maggie) Fu &Chris Y. Tung, "Digital silk road, Silicon Valley and connectivity," Journal of Chinese Economic and Business Studies, 16(3) 2018.*

26 *The State Council, The People's Republic of China, "Connectivity set to accelerate as China, ASEAN align development plans," November 3, 2019 (http://english.www.gov.cn/news/internationalexchanges/201911/03/content_WS5dbeccffc6d0bcf8c4c165d4.html).*

the Smart City Cooperation Initiative, pledging to explore science, technology and innovation cooperation to improve people's livelihoods, and to promote sustainable development in the urbanisation process.[27] They agreed to encourage the establishment of mutually-beneficial city partnerships between ASEAN cities, in particular those under the ASEAN Smart Cities Network, and Chinese cities, such as Nanning, Xiamen, Hangzhou, Jinan, Kunming, Shenzhen, Nanjing and Chengdu. The development of urban centres is the main drive of ASEAN's growth, with 90 million more people expected to be urbanised by 2030.[28]

Meanwhile, India — with a current retail consumer market size of around 800 billion USD — is the fastest growing market in the world, and is estimated to grow at a compound annual growth rate (CAGR) of around 8 per cent. India is also the youngest country in the world, and the average age of her population is of approximately 29 years of age in 2020. It is also the fastest growing internet market in the world. The e-commerce market — consumers purchasing retail goods and services through internet access — is growing at a phenomenal rate of 30 per cent. India currently has around 600 million smart phones in use, and these wireless devices are Indians' primary devices to access the internet.

India has proved attractive to China's technology firms as they have looked to expand outside their domestic market. Chinese investors and businesses have been investing in local companies, pumping an estimated 4 billion USD into Indian start-ups. This involvement is to such a degree that 18 of India's 30 unicorns — i.e. start-ups valued at over 1 billion USD — are now Chinese-funded.[29] Chinese apps, such as the short video-sharing platform TikTok, meanwhile, have managed to challenge big US giants like Facebook and Google, while Chinese smartphone makers, such as Xiaomi have cemented leading positions in India,[30] where they dominate the smartphone market, alongside Samsung. Apple only has a 1 per cent market share in the country. Apple started selling iPhone XR phones assembled in India last year. Apple

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27 *Ibid.*

28 *Ibid.*

29 *Arjun Kharpal, "Chinese firms are learning a painful lesson': India's app crackdown opens doors for U.S. tech giants," CNBC, September 4, 2020.*

30 *Ibid.*

now sees India as a key market for smartphone demand, but also as a manufacturing location as the company looks to reduce its reliance on China. Meanwhile, India has proved popular for Facebook and its WhatsApp messaging service, as well as for Google's Android and YouTube video platform.[31]

How to Balance Digital Trade and Its Security Risks

The digital economy is made up of economic activities conducted or facilitated through digital technologies. Since the digital sphere is part of our everyday lives, there is little to differentiate the digital economy from the broader economy. While there is no single accepted definition of digital trade, the Organisation for Economic Cooperation and Development (OECD) reports that there is a growing consensus that it encompasses digitally-enabled transactions of trade in goods and services that can either be digitally or physically delivered.[32] In other words, digital trade is anything that is enabled by digital technologies, whether or not it is digitally or physically delivered. For example, digital trade would include the purchase and physical delivery of a paper book through an on-line marketplace, as well as the purchase and digital delivery of an e-book. The Office of the US Trade Representative (USTR) defines digital trade as "capturing not just the sale of consumer products on the Internet and the supply of online services, but also data flows that enable global value chains, services that enable smart manufacturing, and myriad other platforms and applications."[33]

Digital trade may be one of the most important and complex policy issues of our day. Digital trade is contributing more to GDP than financial or merchandise flows and is growing on a global basis. Digitalisation is not only creating new trade opportunities for firms to sell more products to more markets, but it is also increasing trade in goods and services across all sectors, and allowing countries to draw greater benefits from trade agreements. In fact, the OECD estimates that ICT services trade increased by 40 per cent

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31 Ibid.

32 OECD, "The impact of digitalisation on trade," (http://www.oecd.org/trade/topics/digital-trade/).

33 Jeannie Salo & Trevor Rudolph, "Digital Trade: Framing the Global Rule Book," November 8, 2019 (https://blog.se.com/government-regulations/2019/11/08/digital-trade-framing-the-global-rule-book-for-our-connected-future/)

from 2010 to 2016.34 Further, global GDP growth is projected to increase by 450 billion USD each year due to digital flows. Analysts estimate that digital flows of goods, services, and finances will rise to 85 trillion USD by 2024.[35]

Unfortunately, however, the three key global actors — the US, the EU and China — are evolving into separate and not entirely compatible digital regimes. This imperils cross-border data flows, the future of digital commerce, and therefore, global trade. Were this situation to deteriorate, the fight for spheres of cyberspace influence within various emerging markets would accelerate, and then two competing models of cyberspace would emerge, with faith in international norm-setting bodies breaking down.[36]

A number of research institutes and scholars point to the geopolitical significance of key digital technologies, naming the field digital geopolitics. According to studies of Stiftung Wissenschaft und Politik and MERICS in Berlin Germany, the new global conflict between the US and China is taking the form of a digital arms race. Unlike the earlier geopolitical conflicts, the new frontier is digitally based, and is built on access to data and information, rather than knowledge based.[37] The EU is economically and technologically dependent on China. European trade, economy, and production chains are inextricably connected to both Chinese and US technologies. Yet China has been deemed culpable for a multitude of cyber espionage incidents against European information and communication structures.[38] The EU's dilemma is that the close security cooperation with the US, including NATO, could lead to an economic decoupling from China.

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34 Ibid.

35 Ibid.

36 Robert Manning, "Techno-Nationalism vs. the Fourth Industrial Revolution," Global Asia Vol. 14, No. 1 (March 2019) (https://www.globalasia.org/v14no1/cover/techno-nationalism-vs-the-fourth-industrial-revolution_robert-a-manning)

37 Annegret Bendiek, Nadine Godehardt, and David Schulze, "The Age of Digital Geopolitics & Proxy War Between US and China," Inter Press Service, September 10, 2020 (http://www.ipsnews.net/2019/07/age-digital-geopolitics-proxy-war-us-china/); Kristin Shin-Kupfer & Mareike Ohlberg, China's Digital Rise: Challenges for Europe, MERICS Papers on China No. 7, April 2019; Rebecca Arcesati, "The Digital Silk Road is a Development Issue," MERICS Short Analysis, April 28, 2020 (https://merics.org/en/analysis/digital-silk-road-development-issue).

38 Bendiek, Godehardt, and Schulze, Op. cit.

The most titanic geopolitical battle between the two great powers is led by the FAANGs (Facebook, Amazon, Apple, Netflix and Google's parent, Alphabet) on the one side, and the BATs (Baidu, Alibaba and Tencent), on the other. These are some of the planet's biggest firms, with a combined stock market capitalisation of more than 4 trillion USD.[39] China blocked Google et al with its Great Firewall, preventing American firms (Apple being an obvious exception) from taking on Chinese rivals on the mainland. Similarly, Chinese giants have stayed out of America; Europe meanwhile fell under the spell of Silicon Valley before Chinese tech had matured.

Indeed, American Big Tech companies are just as dominant outside of the US as they are inside of it. And with US markets relatively saturated, they are seeking to dominate emerging markets. Left-leaning scholars argue that Silicon Valley corporations and Chinese state tech-giants are taking over the digital economy in the Global South. They argue that US Big Tech corporations are wreaking havoc on the Global South, which is a crisis in the tech ecosystem, calling the phenomenon 'digital colonialism'.[40] Alongside the US giants, Beijing is playing an increasingly important role. Most significantly, Beijing wants to create the conditions under which it — not the US or the West in general — will set the standards for the Internet and the surrounding hi-tech environment. The geopolitical balance of power will increasingly be determined by which side controls the flow of data.

Pushbacks and Cyber Security Risks

On August 5, 2020, the US state department announced that it would expand *its* "*Clean Network*" *initiative*, first rolled out in April, to root out major Chinese tech products from the US system. Under the expanded initiative, which focusses on five areas, "untrusted" Chinese telecom carriers, apps, and cloud service providers, including Alibaba, Tencent, and Baidu will be prevented from storing or processing US user data, being downloaded from US app stores, or connected to the US telecom system. Moreover, Chinese smartphone makers, such as Huawei will be prevented from pre-installing or

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39 Andy Fry, "BAT vs. FAANG: The Battle for Digital Dominance," IBC 365, August 21, 2018 (https://www.ibc.org/trends/bat-vs-faang-the-battle-for-digital-dominance/3103.article).

40 Michael Kwet, "Digital Colonialism: US Empire and the New Imperialism in the Global South," Race & Class Vol. 60(4), 3-26.

offering downloads of some US or foreign apps. *Undersea cables* that connect the US to the global internet will also be scrutinised by the US government. More than 30 leading mobile operators from 20 countries have joined the US in excluding components produced by Chinese government affiliates in 5G networks.[41]

The Clean Network initiative demonstrates the important policy evolution on the US side, recognising that securing networks requires more than merely restricting Huawei, or the network transport layer, a policy dating from the Obama Administration. The identification and articulation of network elements, such as carriers, applications, app stores, cloud, and undersea cables shows the State Department's improved intellectual understanding of the complexity and integration of networks.[42] US diplomatic efforts have succeeded in bringing the UK and France aboard. Germany's state-owned Deutsche Telekom is the laggard, and Chancellor Angela Merkel faces growing opposition from both Parliament and public for defending the company's deep ties to China.[43]

The US' concerns about Huawei, which it regards as a threat to national security, landed badly in Southeast Asia. Countries in the region are already planning to develop and deploy 5G in partnership with Huawei. Malaysia is reported to have started running tests for 5G, while Cambodia and Thailand have declared a desire to see 5G deployed in their countries in 2021. Indonesia has also dabbled with 5G internet. Recently, two local mobile network providers, Telkomsel and XL, conducted 5G trials during the 2018 Asian Games. In the Philippines, work is already underway to usher in 5G. Philippine telecommunications firm Smart has already announced plans to deploy a 5G pilot network in the first half of next year, while Globe Telecom has said that a 5G network could be available as early as the second quarter of 2020. Singapore's pilot 5G project is expected to launch by the end of this year.

Tensions between the China and India have been on the rise since June, when a border clash left 20 Indian soldiers dead in the disputed Himalayan

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41 Roslyn Layton, "State Department's 5G Clean Network Club Gains Members Quickly," Forbes, September 4, 2020.

42 Ibid.

43 Ibid.

mountain border in the region of Ladakh. Earlier in June, India banned 59 Chinese apps. Lately, tensions have been flaring up anew. On September 4, 2020, India banned 118 Chinese apps including major hit games from Tencent and NetEase, as well as services from the likes of Baidu, and Alibaba affiliate, Ant Group. India's Ministry of Electronics and Information Technology claimed the apps were "engaged in activities which are prejudicial to the sovereignty and integrity" of the country. The government also alleged these services sent citizens' data to servers located outside of India.

The broader crackdown on Chinese technology opens opportunities for US technology giants such as Facebook and Apple in India. Both Facebook and Google recently invested over 10 billion USD collectively into Indian digital services firm Jio Platforms. Jio Platforms has a number of brands including its telecommunications business Reliance Jio, which has grown rapidly, thanks to competitive pricing, to become the number one mobile carrier in India by revenue and subscriber base. The investment was seen as a way for both technology giants to get a bigger foothold in the Indian market. Google and Facebook, unlike Apple do not have access to the world's largest smartphone market, China. So India is the only huge-scale smartphone market available for these companies.

The undersea wires and cables that carry the internet between continents have become the latest point of contention in deteriorating US-China relations. Google and Facebook have abandoned plans to link Los Angeles and Hong Kong with six roughly 8,000-mile long fibre optic cables, after US officials expressed concern Beijing might use the project to snoop on American citizens' personal data. The Pacific Light Cable Network (PLCN), part of Silicon Valley's push to get in on global internet infrastructure, could have carried 144,000 gigabits of information between the US and China in a single second.[44]

PLCN's connection to Dr. Peng Telecom & Media Group, one of the few significant Chinese private carriers in a market completely dominated by state-owned giants, has attracted US scrutiny. The US partners have now reportedly lodged a proposal that would include the North American legs linking to Taiwan and the Philippines, but would cut the Hong Kong stretch

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44 Kevin Xu, "Southeast Asia and the Pacific Light Cable Network," September 4, 2020 (https://interconnected.blog/southeast-asia-pacific-light-cable-network/)

out. That was after it became clear that approval from the US Federal Communications Commission would not be forthcoming.[45]

Ninety seven per cent of global communications are carried by submarine cables in the sea and not through satellites, contrary to popular belief. To meet the interconnection requirements for global data centres, Internet giants such as Google, Microsoft, and Facebook are becoming the leading force in constructing international submarine cables. These companies have already invested in building more than 15 international submarine cables, covering key links such as North America-Europe, North America-Asia, and North America-South America.[46] It is not only Google and other Internet giants that have deployed data centres; telecom carriers are also building regional service data centres. Data flow between data centres requires a large amount of bandwidth, large granularity of circuits, and rapid bandwidth scaling.[47]

Huawei, which had originally concentrated on short-distance cables, has expanded in recent years to undersea cables connecting Africa and Latin America. The company announced in June 2020 that it would sell its undersea cable assets, but the business will probably continue under the auspices of another Chinese telecom giant. Japan's NEC is one of the top three suppliers for undersea cables, along with US-based Subcom and France's Alcatel Submarine Networks.

In July 2020, Chile has chosen a route proposed by Japan for the first fibre-optic cable to directly connect South America and the Asia-Pacific region, designating Australia and New Zealand as endpoints while stopping short of landing in China. Japan's route was chosen over a pitch by China that would have made Shanghai the final landing point.[48] The Chilean government says this route is the most recommended based on cost and feasibility. Japan and Australia completed their own submarine cable linking the two countries

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45 *Jeremy Page, Kate O'Keeffe, & Rob Taylor. 2019. "America's Undersea Battle With China for Control of the Global Internet Grid." Wall Street Journal, March 12, 2019.*

46 *China Academy of Information and Communications Technology (CAICT), White Paper on China International Optical Cable Interconnection. August, 2018, p. 5.*

47 *Ibid.*

48 *Yohei Hirose and Naoyuki Toyam, "Chile picks Japan's trans-Pacific cable route in snub to China Decision a blow to Huawei and Chinese telecom sector," Nikkei Asian Review, July 29, 2020.*

in July, meaning Japan could easily connect to the trans-Pacific cable. Both Australia and New Zealand share deep ties with Chile through the Trans-Pacific Partnership, the trade deal that Tokyo has pushed for. The Japanese proposal to Chile took into account Australia's hardline position against Beijing, exemplified by Canberra's decision to blacklist China's Huawei Technologies from its 5G infrastructure.[49]

Chile was caught in the geopolitical crossfire as China, its largest trading partner, lobbied heavily for the cable plan to have Shanghai as its terminus. When Chilean president Sebastián Piñera visited Beijing in April 2019, Huawei pledged to invest in data centres in Chile. Huawei Marine initially emerged as the leading candidate for the undersea cable. But the South American country was unable to ignore US intentions in diplomacy and trade. Right before Mr Piñera's visit to China, US secretary of state Mike Pompeo arrived in Chile and accused Huawei of being controlled by the Chinese government, which would put Chileans at risk.[50]

Conclusion

New trade frictions are arising as the new modes of trade across borders are dependent on access to the internet and to the cross-border flow of data. The economic benefits of digital trade connectivity and facilitation enabled by China's DSR are self-evident. However, the ubiquitous access to, as well as ownership and exchange of, personal, governmental and corporate data has given rise to several legitimate debates and concerns. Unlike trade in traditional hard goods and services, the rules governing digital trade in the global marketplace are not yet written. And until they are, we are all operating in an ungoverned space that limits our ability to realise the full potential of the digital era.

The US and China are poised to play major roles in crafting international e-commerce regulations. The US government and some data privacy advocates believe that greater involvement by Chinese companies in multilateral technology standards-setting efforts could materially alter the course of global norms in a manner the US and other democracies would not support. It is becoming increasingly challenging, however, to balance the

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49 Ibid.

50 Ibid.

tension between Beijing's stated ambitions of the DSR with the desire to set effective global standards applicable to all.

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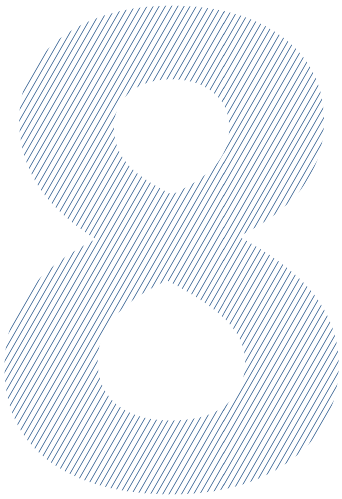

Framework for India's Cross-Border E-Commerce

Sharmila KANTHA

Framework for India's Cross-Border E-Commerce Paper for Konrad-Adenauer-Stiftung SOPAS, Tokyo

Sharmila KANTHA

The global e-commerce industry saw a marked uptick induced by Covid-19 mobility restrictions; analysts expect the sector to grow faster than pre-Covid estimates as consumers avoid physical markets.[1] The change in consumer habits could persist even after the pandemic is controlled, providing a new and wider platform for sellers to access markets. For small enterprises and individual-owned businesses, —particularly those located outside large urban centres — this trend offers new opportunities to reach more consumers and enhance incomes, thus empowering a new class of entrepreneurs.

In addition, e-commerce boosts related businesses, and thus indirectly provides new jobs, in several sectors — from logistics, to financial services, from marketing and advertising, to real estate.

Countries with an open digital trade have lower trading costs, and are more productive, while also bringing benefits for consumers in terms of competitive prices and better products. High adoption of technology and the internet helps small- and medium-sized enterprises (SMEs) to grow 2.1 times faster than equivalent businesses with lower adoption.[2] SME producers benefit from an expanded market, improved efficiency and better information access. Digital technology lowers costs of overheads and physical assets, encourages SMEs to scale up, and provides them with better security and software. A special benefit accrues to women as it enables them to balance work and family responsibility, often facilitating work from home. Thus, e-commerce offers

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1 *MediaPost, Goldman Sachs revised global e-commerce growth estimate, cites COVID as catalyst, July 21, 2020 https://www.mediapost.com/publications/article/353896/goldman-sachs-revises-global-ecommerce-growth-esti.html accessed on 19 August 2020*

2 *Wang, Diane, The standards and regulations of cross-border e-commerce and their effect on SME competitiveness, International Trade Centre, https://www.intracen.org/SMEOutlook/The-standards-and-regulations-of-cross-border-e-commerce-trade-and-their-effect-on-SME-competitiveness/ accessed on 2 Sep 2020*

an effective route to inclusion.[3] In its 2019 Osaka declaration, the G20 group reiterated the importance of the interface between trade and the digital economy, thereby recognising its value to development.

Worldwide, e-commerce sales were estimated at 29 trillion USD in 2017, with business-to-business (B2B) trade forming the large majority, at 25.5 trillion USD.[4] Digital retail penetration escalated for China and the US as a result of Covid-19 related lockdown measures.[5] While a low share of enterprises engages in cross border transactions, the numbers are growing.

The experience of China in addressing overseas markets through digital platforms is notable. Its worldwide e-commerce transaction value grew to 40 per cent in 2018, and a survey by the International Post Corporation (IPC) notes that it was the source country for almost 40 per cent of all global cross-border consumer purchases.[6] Bypassing traditional export models, the number of Chinese villages significantly engaged in e-commerce increased to over 3,200 in 2018. A World Bank study indicates that so-called 'Taobao' villages boost entrepreneurship and enhance employment, including for women. However, e-commerce significantly depends on infrastructure availability, internet access and access to markets.[7]

In India, the second largest country in terms of population, and home to the largest number of poor people in the world, the e-commerce space is driven by better access to digital technologies among consumers, and can function

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3 *Asia-Pacific Economic Cooperation (APEC), Facilitating Digital Trade for Inclusive Growth. Key Issues in Promoting Digital Trade in APEC, Issues Paper No. 12, APEC Policy Support Unit, April 2017, downloaded from https://www.apec.org/Publications/2017/04/Facilitating-Digital-Trade-for-Inclusive-Growth-Key-Issues-in-Promoting-Digital-Trade-in-APEC 2 Sep 2020*

4 *UNCTAD Information Economy Report 2017*

5 *Bain & Co, How India Shops Online, https://www.bain.com/globalassets/noindex/2020/bain_report_how_india_shops_online.pdf accessed on 19 August 2020*

6 *International Post Corporation, Cross Border E-commerce Shopper Survey 2019 https://www.ipc.be/sector-data/e-commerce/cross-border-e-commerce-shopper-survey accessed on 3 Sep 2020*

7 *World Bank blog, In China's Taobao villages, e-commerce is one way to bring new jobs and business opportunities to rural areas, November 22, 2018 https://blogs.worldbank.org/eastasiapacific/china-s-taobao-villages-e-commerce-one-way-bring-new-jobs-and-business-opportunities-rural-areas accessed on 21 August 2020*

as a viable channel for poverty alleviation. As a large emerging economy, India's experience in empowerment[8] through cross-border e-commerce would be a valuable guidepost to the potential of policy promotion for the sector in other emerging economies.

Access to digital services in India has transformed the socio-economic conditions for poorer sections of society. With low-cost internet and smart phones, millions of people are able to reach out to customers through e-commerce and/or social media platforms. Therefore, rather than technology replacing jobs, India is experiencing it as an enabler for access to financial services, public services, education, healthcare, and other goods and services. While this is helping providers of these services reach out to a larger section of society, it is also facilitating individuals in India's large informal sector to expand the market for their goods and services. Examples of these are cab drivers on transport platforms, small mom-and-pop store owners, personal services providers, e-commerce and local delivery personnel, food services providers, and so forth. This process is further encouraged by means of supportive infrastructure, logistics, software development, startups and various Government programmes.

The conditions for empowerment through digital platforms can be replicated to foster cross-border digital trade. The large global market that would be accessible, with the right conditions, to support e-commerce exports and imports would provide further opportunities to people at the lower end of the income scale to develop new sources of income. A range of measures would be required in terms of policies and infrastructure; however, the benefits could be significant. This paper analyses how cross-border digital trade can supplement the vibrant and growing e-commerce space in India, and further drive empowerment through digital technology.

India is home to 503 million active internet users, the second highest number after China, with the cheapest data costs in the world per gigabyte. Despite growing internet access, e-commerce remains a relatively underused and underserved market with just 4 per cent of mobile time being spent on online purchases. However, the e-commerce market is growing rapidly, and is expected to multiply five-fold between 2017 and 2026, a trend that is likely to be accelerated in the emerging Covid-19 economy.

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8 In this paper, we use the term 'empowerment' to refer to new livelihood opportunities.

Enticed by this surge, e-commerce platforms are proactively wooing Indian sellers to reach out to global markets, providing assistance, knowledge and facilities. This process could emerge as a significant factor for empowerment of poorer sections of society, by providing cross-border trade for niche markets, driving manufacturing and related services of transport and logistics, and creating new livelihood opportunities.

India's E-commerce Sector

India's e-commerce market for consumers stood at 38 billion USD in 2017, and is slated to expand to 200 billion USD by 2026, with B2B commerce estimated at 300 billion USD.[9]

India's vibrant e-commerce sector is one of the fastest growing in the world. Its per capita income is trending upwards, rising from 1,560 USD in 2014, to 2,130 USD in 2019, and it enjoys a working-age population share of 67 per cent.[10] One of the main reasons for the industry's expansion has been the rapid spread of internet access which has fostered virtual interactions for all income classes.

As of 31 March 2020, the country counted 687.44 million broadband subscribers, of which 668 million opted for the mobile devices route. As many as 1.16 billion wireless connections had been subscribed, with close to 520 million being in rural areas.[11] It is notable that about 84 per cent of mobile phone sales in the country relate to low-cost devices, costing less than 200 USD, implying high penetration among middle- and low-income population segments.[12]

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9 *Department of Promotion of Investment and Internal Trade (DPIIT), India, Draft National E-commerce Policy for Stakeholder Consultations, https://dipp.gov.in/whats-new/draft-national-e-commerce-policy-stakeholder-comments accessed on 19 August 2019*

10 *World Bank country data for India accessed on 12 August 2020*

11 *Telecom Regulatory Authority of India, Press Release 14 July 2020 https://www.trai.gov.in/sites/default/files/PR_No.49of2020_0.pdf accessed on 12 August 2020*

12 *International Data Corporation (IDC), Press Release 7 August 2020 https://www.idc.com/getdoc.jsp?containerId=prAP46764220 accessed on 12 August 2020*

Further, digital payments in India have rocketed as financial technology (fintech) expands, with government policies for financial inclusion and online transactions creating a beneficial climate. A range of fintech options, such as credit and debit cards, point of sale, internet banking, mobile banking and unified payments interface (UPI) are available for Indian buyers under the government's Digital India Programme for faceless, paperless and cashless financial intermediation. The digital payment trend, which commenced with the demonetisation of the currency in 2016, is expected to accelerate post-Covid by 37 per cent in 2022, an additional 6 percentage points than earlier estimated.[13]

Digital India, the government's flagship programme for digital empowerment, plus policies relating to financial inclusion and e-governance have fostered greater familiarity with digital processes. The government introduced Jan Dhan Yojana as a no-frills bank account in 2014 for universal household access to banking, which now numbers over 400 million accounts. Various government schemes are routed through this to support incomes of the disadvantaged. India's unique identification card for each resident, Aadhar, is linked to this bank account as well, enabling better targeting of government subsidy programmes for the poor. During the pandemic lockdown from end-March 2020, the Government provided direct benefits transfers to beneficiaries through these accounts. Digital India similarly plans to provide broadband access to all 600,000 villages in India in the next three years and has already connected 150,000 villages with optical fibre.[14] Further, different portals have been established to enable e-commerce and bring small sellers onto formal platforms. Several other platforms are also helping to spread digital commerce, such as the government e-marketplace for online public procurement (GeM), Udaan, a B2B online platform, and Internet Saathi (friend), a digital literacy programme targeted at women.

E-commerce has had a transformational impact on India's socio-economic environment. The sector is expected to contribute 2.8 per cent to India's

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13 *Economic Times, Covid-19 pandemic may push digital pay up 37% to Rs 4,067 lakh crore by FY 2022, August 13, 2020 https://tech.economictimes.indiatimes.com/news/internet/covid-19-pandemic-may-push-digital-pay-up-37-to-rs-4067-trillion-by-fy-2022/77515451 accessed on 19 August, 2020*

14 *Speech by Prime Minister Narendra Modi on the occasion of India's Independence Day, 15 August 2020, https://www.financialexpress.com/india-news/pm-narendra-modi-independence-day-2020-speech-live-streaming-updates-red-fort-delhi/2055332/*

GDP by 2024, from 1 per cent in 2015, and to create 12 million new jobs by 2025.[15] This increase is facilitating rapid growth for startups as well as small businesses, with new ideas and platforms driving scale across sectors, such as SMEs, financial services, service providers in areas such as travel and entertainment, and logistics businesses.

As a result of these developments, India is being seen as a leading market and new hub for e-commerce with fresh investments pouring into the sector from global giants, despite the pandemic situation. Jio Platforms, the telecom wing of industry group Reliance Industries Ltd, garnered an investment of 20 billion USD within a mere three months, including large investments from Facebook and Google.[16] Similarly, the Tata Group conglomerate plans to launch a super-app to integrate its e-commerce offerings.[17]

Cross-border E-commerce

India's engagement in cross-border e-commerce includes both exports and imports. In the financial year April 2018 to March 2019, 1.2 billion USD worth of exports took place via e-commerce.[18] About one-third of those buying digitally in India also accessed the global market, and Indian cross-border shopping values were among the top ten globally in 2017.[19]

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15 *Confederation of Indian Industry & KPMG, Enabling sustainable growth for the new digital businesses, October 2019*

16 *Financial Times, What is Silicon Valley's Plan in India, 28 July 2020, https://www.ft.com/content/318bdea3-d162-4cf2-9ffd-905e8520cf40 accessed on 4 Sep 2020*

17 *Financial Times, Tata to launch super app covering range of digital services, https://www.ft.com/content/cac74a6a-3e03-4050-a9ab-7c56698157b8 accessed on 4 Sep 2020*

18 *Economic Times, Export promotion via e-commerce on the cards, May 30, 2019 https://economictimes.indiatimes.com/industry/services/retail/export-promotion-via-ecommerce-on-the-cards/articleshow/69570099.cms?from=mdr accessed on 21 August 2020*

19 *PayPal Cross-Border Consumer Research 2018 https://www.paypalobjects.com/digitalassets/c/website/marketing/global/shared/global/media-resources/documents/PayPal_Insights_2018_Global_Report.pdf accessed on 21 August 2020*

The key products of interest to Indian buyers are automotives, toys, clothing and footwear, and other consumer durables, as well as entertainment and educational services.[20]

Amazon India, which launched its Global Seller programme in 2015, numbers 60,000 registered sellers which access overseas markets, including small businesses, artisans and women entrepreneurs, accounting for a cumulative 2 billion USD worth of exports since its inception, and having grown by 100 per cent from 2018 to 2019. As many as 140 million products are listed through this channel. The portal provides a range of packing and logistics services, along with support for sellers with regard to exports. The company plans to facilitate exports of 10 billion USD worth of goods from India by 2025.[21] The case studies mentioned on the website attest to the potential for SMEs to engage in cross-border e-commerce, and its benefits to them in raising incomes and increasing employment and revenues.

The government of India recognises the potential of exports via e-commerce, and media reports suggest it is considering measures to expand the sales of made-in-India products.[22] To avoid misuse of the route, it announced in December 2019 that items imported as 'gifts' would be subjected to import duties; earlier, items with a value of less than 5,000 INR could be imported without payment of customs duties, which had led to a large number of goods entering the country via e-commerce as gifts.

In the services category, the evolving trend of online delivery can be expected to accelerate in the pandemic-related work environment, which has shifted attitudes with regard to work from home, now seen as a viable option. Not surprisingly, India emerges as the largest supplier of online labour with 24 per cent of such workers as of 2017. These workers primarily offer software development and technology services, where India accounts for 55 per cent

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20 *Confederation of Indian Industry & KPMG, Enabling sustainable growth for the new digital businesses, October 2019*

21 *Amazon India website https://services.amazon.in/services/amazon-global-selling/benefits.html accessed on 21 August 2020*

22 *Economic Times, Export promotion via e-commerce on the cards, May 30, 2019 https://economictimes.indiatimes.com/industry/services/retail/export-promotion-via-ecommerce-on-the-cards/articleshow/69570099.cms?from=mdr accessed on 21 August 2020*

of the market share, followed by creative and multimedia services, and sales and marketing support.[23]

However, the per capita spend of online shoppers in India is low.[24] Thus, there is plenty of scope for the sector to expand, and for global sellers to access the Indian market, and vice versa.

Challenges to Cross-border E-commerce

While the environment for e-commerce is improving, with better access to technology and digital tools, several key challenges mark the sector, which are compounded with regard to cross-border movement of goods. According to the Asia-Pacific Economic Cooperation (APEC) forum, the digital economy in general presents issues related to privacy and data security, taxation of firms located overseas, and social, technological and innovation challenges.[25] Some of these challenges shall be outlined, below.

Lack of adequate information

Consumers are unable to reach out to suppliers in other countries due to gaps in knowledge about procedures, and anxiety about complexities. Likewise, vendors face challenges with regard to documentation, as clear directives for e-commerce export procedures are lacking. The IPC survey finds that advance knowledge about delivery charges and free delivery over a certain amount are key considerations for buyers.[26]

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23 *Where are online workers located? The international division of digital gig work, The iLabour Project, Oxford Internet Institute, University of Oxford, https://ilabour.oii.ox.ac.uk/where-are-online-workers-located-the-international-division-of-digital-gig-work/ accessed on 3 Sep 2020*

24 *E-commerce Payments Trends India, JP Morgan, https://www.jpmorgan.com/merchant-services/insights/reports/india accessed on 3 Sep 2020*

25 *Asia-Pacific Economic Cooperation (APEC), Facilitating Digital Trade for Inclusive Growth. Key Issues in Promoting Digital Trade in APEC, Issues Paper No. 12, APEC Policy Support Unit, April 2017, downloaded from https://www.apec.org/Publications/2017/04/Facilitating-Digital-Trade-for-Inclusive-Growth-Key-Issues-in-Promoting-Digital-Trade-in-APEC 2 Sep 2020*

26 *International Post Corporation, Cross Border E-commerce Shopper Survey 2019 https://www.ipc.be/sector-data/e-commerce/cross-border-e-commerce-shopper-survey accessed on 3 Sep 2020*

Reliability of products

Consumers may not be certain about the quality of the products on offer due to being unfamiliar with the sellers.

Payment procedures

In several countries, online payments from overseas may pose a hurdle to selling. Use of foreign currencies is often challenging in terms of information and conversion issues.

Higher costs

Transportation of goods across long distances leads to higher costs for individual orders, especially smaller packages sent through courier service.

Cyber security

Issues regarding security of transactions and hacking discourage buyers and sellers from availing themselves of e-commerce facilities.

Last mile[27] delivery and returns

Last mile logistics facilities to connect sellers with buyers are often unavailable. Similarly, even with facilitative logistics options, return of unsatisfactory goods is complicated across borders, which makes buyers wary. The presence of a simple and reliable returns policy was identified by about half the shoppers as key in the IPC survey.

Language barriers

Language and translation facilities in websites of other countries may not be accurate or lead to differences in expectations.

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27 *Last mile is a term used in supply chain management and transportation planning. It describes the movement of people and goods from a transportation hub to a final destination.*

Different taxation systems and import duties

Customers find taxation systems and import duties that differ from country to country to be a key hurdle in sourcing from overseas.

Documentation

Cumbersome and diverse documentation procedures discourage exporters as well as importers in overseas transactions.

Electronic transaction facilitation

The online contractual process can be difficult in countries without the facilities for electronic signatures, time stamps, seals, web authentication certificates, and registered delivery services.

For smaller sellers, particularly artisans, farmers, small retailers, and niche producers, additional challenges relate to lack of familiarity with digital transactions, quality of products for overseas markets, and information gaps with regard to export and import procedures. In order to proactively promote cross-border options for such individual sellers, skills development and capacity building is an imperative.

Online platforms and logistics companies are devising a range of facilitative services to enable the smoother movement of goods, including marketing, packaging, documentation, payment of customs duties, and returns. Innovations such as pre-paid duties and overseas fulfilment centres provide faster delivery times and reduced costs of shipping. Successful e-commerce platforms invest in strong logistics, such as warehouses for their online traders.

However, governments need to work on creating the right awareness and information, as well as facilitating the movement of goods, especially at the border, so that domestic merchants are able to access global markets. In China, e-commerce imports were facilitated by creating special pilot zones for this purpose, including bonded warehouses where goods can be stored pending import clearance. Due to the large market and customer preferences for imported items, foreign merchants stock up wholesale in

these warehouses, and import procedures and shipments are completed following an e-commerce order.[28]

Despite these measures, the European Centre for International Political Economy's (ECIPE) Digital Trade Restrictiveness Index (DTRI),[29] which measures 64 countries, finds that China is the most restrictive country in terms of e-commerce, with regulations impacting trade, information and communications technology (ICT) investments, and movement of people. Russia, India, Indonesia and Vietnam form the remaining top five. The DTRI shows that China's trade policies cut across numerous areas such as public procurement, FDI, Intellectual Property Rights, competition policy, standards, and so forth. India has high restrictions of public procurement, and standard setting with high tariffs on digital goods. However, it has open data policies that have contributed to its ICT service exports.

Indian E-commerce Policy

The Indian government has been working on e-commerce since 2000, with a view to enabling 100 per cent foreign direct investment (FDI) in the sector for the B2B segment. The FDI policies for e-commerce brought out in 2016 and 2018 outline conditions for e-commerce marketplaces and do not permit an inventory model of e-commerce.

India brought out a draft e-commerce policy in February 2019 to strengthen the sector, and to develop its requisite administrative, regulatory and legal mechanisms. The policy addressed issues such as consumer protection, data privacy and a level playing field taking into account the interests of investors, SMEs, retailers, startups and consumers.

A key point of discussion regarding the draft paper was ownership of commercially useful data. The draft policy placed restrictions on the storage of cross-border data flows emanating from e-commerce platforms and social media. It provided for classification of data as infrastructure, and

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28 TMO Group, China bonded Warehousing and Cross-border eCommerce Tax Reform, https://www.tmogroup.asia/bonded-warehousing/ accessed on 2 Sep 2020

29 European Centre for International Political Economy (ECIPE) Digital Trade Restrictiveness Index, Martina Francesca Ferracane, Hosuk Lee-Makiyama, and Erik van der Marel, 2018 https://globalgovernanceprogramme.eui.eu/wp-content/uploads/2019/09/Digital-Trade-Restrictiveness-Index.pdf accessed on 2 Sep 2020

development of data storage capacity in domestic-based clouds. However, the feedback was that introducing such data localisation policies would not be conducive to the sector's growth.

In order to ensure customer protection against fake and counterfeit products — accountability, blacklisting and financial disincentives were recommended. E-consumer courts and regulation of advertising charges were also included in the draft.

The draft policy, inter alia, developed a framework for promoting e-commerce exports. It proposed increasing the limits for consignments, reducing documentation, and fast-tracking the introduction of Electronic Data Interchange. Industry inputs suggested that returns remained a challenge for those selling overseas due to import duties on returned items. Horizontal marketplace e-commerce companies also called for clear and consistent processes and procedures for exporters.

In addition, a cybersecurity policy is also under consideration. Cybercrime reporting in India surged from about 12,300 cases in 2016 to 27,250 cases in 2018.[30]

Policy Implications

The United Nations Convention on the Use of Electronic Communications in International Contracts (UNCITRAL) of 2005 provides a regulatory framework for global e-commerce, alongside its model laws for electronic commerce, adopted in 1996. Electronic signatures are directed as guidelines for national cross-border e-commerce regulations. Anecdotal information suggests that connectivity between global buyers and sellers has improved tremendously over the last few years. This is namely due to safer financial transactions, secure payment gateways, means of making payments through local currencies, and faster delivery mechanisms.

There is strong synergy between public and private strategies for promoting e-commerce in general, and for promoting cross-border e-commerce specifically. Most such facilitative measures work for both segments.

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30 *ThePrint, India to get new, 'robust' cyber security policy soon, says PM Modi, 15 August 2020, https://theprint.in/india/india-to-get-new-robust-cyber-security-policy-soon-says-pm-modi/482356/ accessed on 11 October 2020*

Domestic e-commerce is boosted through measures such as, but not limited to, better financial systems, improved logistics, and cybersecurity protection. Additional measures to promote cross-border e-commerce include better border infrastructure, raising awareness, facilitating movement of funds across countries, boosting quality of goods and developing skills to meet the more demanding requirements of overseas markets.

The Confederation of Indian Industry (CII), India's leading industry body, has called for a flexible and adaptive policy framework to promote e-commerce within the country.[31] Such an approach would need to balance the functioning of digital trade for all stakeholders and across issues, including consumers, workers, SMEs, vendors and traders, cyber-security, tax revenues and the overall business environment. The CII posits that given the constant acceleration of digital technologies and their growing incorporation throughout the economy, future regulatory needs cannot be anticipated; thus the need for an adaptive framework. Enabling rapid innovation should also be a key consideration while drafting new policies.

The CII further notes that the digital aspect of various sectors is already monitored by dedicated regulators in India, and that e-commerce should remain under the oversight of these same authorities, thereby avoiding the creation of a new regulator. For example, the food safety authority can cover food delivery e-commerce companies. However, certain themes, such as consumer protection, data privacy, cyber-security and others should be organised through a central authority which would draft the right guidelines and monitor implementation by e-commerce players.

There have also been instances of companies coming together to address issues such as fake customer reviews, secure payment systems, and so forth. This form of self-regulation to ensure stronger consumer confidence ought to be promoted.

Following the inputs received from stakeholders, the government is believed to be making changes to its draft policy. As per media reports, the new policy

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31 *Confederation of Indian Industry & KPMG, Enabling sustainable growth for the new digital businesses, October 2019*

incorporates many of the suggestions from industry, and shall be brought out for further consultations.[32]

In addition to its overall policy for digital trade, India must also improve its physical and digital infrastructure. Reliable electricity availability for a sufficient number of hours per day is still lacking, especially in rural and remote areas. The mission to spread broadband throughout the country is underway, yet while fibre-optic cables have reached cities and towns, it will still take a few more years to connect all villages.

The third critical area for infrastructure development is that of road and rail connectivity. The country has progressed quickly on the construction of key arteries between major cities, and has also fast-tracked village roads. However, last-mile transport still poses a challenge. Similarly, the carriage of freight is skewed towards road transportation, and the railway charges structure favours passengers over goods, leading to greater share of road transport over rail transport, meaning higher costs for sellers.

Information gaps can best be addressed by e-commerce platforms, which can also assist sellers in enabling international transactions. The model followed by Amazon India rapidly onboarded thousands of sellers with a range of items, doubling revenues through its platform in a single year. Other platforms also appear to be attempting such a strategy; however, reaching out to sellers is proving challenging. However, with the increasing adoption of digital trade in the domestic market, cross-border e-commerce will also inevitably grow.

The government must also facilitate the closing of information gaps, for instance by offering online learning modules to prospective sellers in the small and medium sector regarding market opportunities, procedures for exporting, and import regulations in partner countries. Many overseas markets apply standards that are either not known to Indian manufacturers, are too expensive to comply with, or require certifications that may necessitate additional time and costs. Indian manufacturers should have

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32 *E-commerce: Draft policy suggests periodic audit of storage locations of players like Amazon, Flipkart, Financial Express, July 4, 2020, https://www.financialexpress.com/industry/e-commerce-draft-policy-suggests-periodic-audit-of-storage-locations-of-players-like-amazon-flipkart/2012941/ accessed on 31 August 2020*

such information readily available so that they are able to identify, and avail themselves, of low-hanging opportunities.

Likewise, skill development of sellers as well as workers across the supply chain and logistics sectors can be strengthened in order to meet the demands of overseas consumers. This is, in fact, a general necessity for the economy as a whole, where a very low percentage — less than 5 per cent — of the workforce has formally acquired skills.[33] Requisite training includes basic entrepreneurial skills, such as, inter alia, marketing, accounting, process management, and quality management. Additionally, the particular skills required for exports would include, inter alia, marketing for overseas consumers, ability to manage delivery schedules, managing finances and cross border fund flows, familiarity with export procedures and requirements for standards, and good communication skills.

Facilitative and simple payment gateways for cross-border online transactions would be a key factor in boosting the sector. Recent years have seen an explosion in digital payments with the use of cash on delivery declining.[34] Several laws and regulations, such as the Payment and Settlement Systems Act, 2007, provide powers to the Reserve Bank of India, India's central bank, to regulate payment systems. While global payment systems such as PayPal and Payoneer are available in India, offering the option of local currency receipts, small businesses need to be encouraged to use them for global markets.

These suggestions are summarised briefly into actions that the government can undertake in the short term, and those that will require a longer period of time for drafting, following consultations. While most of these are relevant for the entire e-commerce sector, including domestic and cross-border trade, some are specific to overseas engagement.

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33 *Explained: Gap between Skill India goals and current status, Financial Express, 19 March 2019, https://www.financialexpress.com/opinion/skill-india-why-there-is-a-gap-between-current-status-and-goals-explained/1520633/ accessed on 3 Sep 2020*

34 *E-commerce Payments Trends India, JP Morgan, https://www.jpmorgan.com/merchant-services/insights/reports/india accessed on 3 Sep 2020*

Immediate actions

- Ensure competitive rail transport charges.
- Encourage e-commerce companies to reach out to exporters and place them on a digital platform. An incentive can be offered, such as a reduction in levies.
- Fast-track creation of e-commerce enabled facilities at ports.
- Ensure that the financial system facilitates refunds on returns of exported products.
- Bridge the information gap by creating online modules for export procedures, certifications and standards, and overseas market conditions. Industry associations can also take a lead in this by connecting their domestic members with partner associations in other countries. For example, the CII has institutional partnerships with close to 400 such organisations in 133 countries.
- Introduce skill development courses for addressing overseas markets including digital literacy, financial literacy, language skills and marketing skills.

Medium-term actions

- Undertake consultations with all stakeholders to introduce an encouraging and facilitative e-commerce policy with society-wide participation.
- Implement the fibre-optic cable programme in a timely manner to reach all geographies.
- Open up the financial sector so that more international fintech companies are present in the market to facilitate cross-border fund flows.
- Create the necessary infrastructure for last-mile connectivity.
- Introduce a cybersecurity policy.

With some of these changes in place, the costs to access overseas markets would be reduced, and the ecosystem would emerge as more facilitative for smaller sellers, making their products more competitive.

Conclusion

With cross-border e-commerce gaining pace across the world, especially in the wake of the Covid-19 pandemic, it can be a significant instrument for countries such as India to strengthen small businesses. Recognising the business opportunities in India's fast-growing e-commerce sector, regarding both domestic and global trade, overseas firms are investing heavily in it.

A concerted and comprehensive policy addressing all the aspects of trade through the online route can facilitate job creation on a larger scale. There are reports that the proposed e-commerce policy addresses export promotion through e-commerce, however since the draft has not yet been placed in the public domain, this cannot be verified. Nonetheless, the earlier draft of February 2019 is already promising, in that it mentions a number of important elements, such as strategies of infrastructure development, shipments through courier mode, simplification of bank transfers, and the reduction of charges.

With this forerunner to the policy and changing conditions since the draft was prepared, it may be assumed that the Indian government will shortly introduce a new strategy to encourage and promote cross-border e-commerce, thereby bringing gains to many small businesses and workers.

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