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INTERNATIONAL COMPETITION IN THE DIGITAL AGE: AN ANALYTICAL FRAMEWORK

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Abstract

This study seeks to provide clarity on the fuzzy nature of digital economic policy through a proposed analytical framework. The proposed digital competitiveness framework builds upon a broad literature seeking to define the broad aspects of the digital economy to propose a tiered analytical framework. This framework translates into a quantitative index where the tiered structure provides a convenient metric for policymakers to identify key strengths and weaknesses in the digital economies that require intervention.

When applied to a group of 11 diverse Asian economies the resulting index demonstrates a clear positive relationship between the digital competitiveness of an economy and the level of broader economic development. The study further explores at length the digital economies of China, Japan and India to demonstrate the broad applicability of the framework in formulating policy. The key finding is that even economies often assumed to be on the technological frontier face developmental challenges in terms of the digital economy. The most notable challenge being the prevalence of unequal digital access.

Keywords
Digital Economy; Technology; Economic Development; China; Japan; India; Asia

Jel Classifications
O10, O21, O57

Introduction

The rise of the digital economy has become a phenomenon that is impossible to ignore. Its importance is felt in both developed and emerging economies. Key evidence of this lies in digital economy provisions having found their way into both the CPTPP and the RCEP, the marquee multilateral trade agreements of the day. This signals the serious inclusion of the digital economy into the national economic policies and strategies of a large proportion of the global economy. The competition among economies now has an increasingly digital dimension.

The question then arises, what is the digital economy? For all the attention directed at the phenomenon, the definition of the digital economy remains a protean concept (Bukht & Heeks 2017). This extends into attempts to create methods for measuring the digital economy. Even where methods for statistics are available, the quality and availability of data remains often times poor (UNCTAD 2019, 2021).

This lack of clarity creates a daunting challenge for policy-setting. Policymakers are faced with the rather ironic situation of having to create policy for a data and information driven economy while being limited by a lack of information and data to inform and monitor said policies. These constraints are alarming for they favor economies with a technological advantage, fueling a potential digital divide (UNCTAD 2021). Technological disruption is not a new phenomenon and indeed with regard to digital technologies, even expected. (Aaronson and Leblond 2018; Bruno et al. 2011; Guillén and Suárez 2005 and Zhao, Collier, and Deng 2014). The potential for uneven distribution of opportunities both across and within countries have made national economic competitiveness in the digital era an increasingly urgent issue.

The goal of this study is thus to address this issue of evaluating the digital competitiveness of an economy such that meaningful measures can be put in place to achieve sustainable growth. It seeks to achieve this through the development of a conceptual framework that considers the key aspects of a competitive digital economy.

The Asia Competitiveness Institute (ACI) Digital Competitiveness Framework draws upon the latest in available statistics, global standards and academic literature for evaluating the digital economy and policy formulation. Fundamental to this is the recognition that the digital economy is a broad ranging concept that encompasses not only the traditional ICT industries but includes a broader range of social, economic and governance factors to which digital technologies may be applied. The framework is translated into a quantitative measure by means of a composite index. The performance of economies in this Digital Competitiveness Index is corroborated with the social and policy realities of the economies in the index to demonstrate its utility.

Reviewing Definitions and Frameworks

A fundamental challenge to developing methodologies for quantifying and assessing the digital economy is the lack of a broadly adopted and harmonized definition of the digital economy (Bukht and Heeks 2017, Hana 2020 and UNCTAD 2019). Where a definition is proposed, it is often lacking for practical purposes of developing policy or measurement. The OECD 2020 definition is emblematic of this issue. The OECD proposes as a definition:

"*The Digital Economy incorporates all economic activity reliant on, or significantly enhanced by the use of digital inputs, including digital technologies, digital infrastructure, digital services and data. It refers to all producers and consumers, including government, that are utilising these digital inputs in their economic activities*" (OECD 2020)

Given the prevalence of ICT and digital technologies in modern day-to-day life, the OECD definition is broad to the point of offering little in the way of clarification for the purposes of precise quantification. Any attempt at using such as broad definition to develop a measurement methodology runs the risk of encompassing all economic activity as pointed out by IMF (2018).

The IMF thus chooses to eschew broad definitions and instead focus on a smaller core "*digital sector*" that comprises "*online platforms, platform-enabled services and suppliers of ICT goods and services*". This focused approach on a more specific set of aspects of the digital economy is applied in the ITU ICT Development Index, ITU Global Cybersecurity Index and in various national and academic studies. (Barefoot et al. 2018, Brynjolfsson, Collis, and Eggers 2019, Gekara et al 2019 and Mesenbourg 2001) Such an approach naturally results in omissions when dealing with the issue of competitiveness among economies. This issue involves the interplay of many individual aspects (Porter 2011).

The OECD (2020) recognizes the limitations of such a definition and thus further proposes that the definition be further split into tiers delineated by degree of reliance on digital inputs. This is its attempt at bridging the two approaches. The UNCTAD in UNCTAD (2019) that draws upon the work of Bukht and Heeks (2017) adopt a similar tiered approach defined as follows:

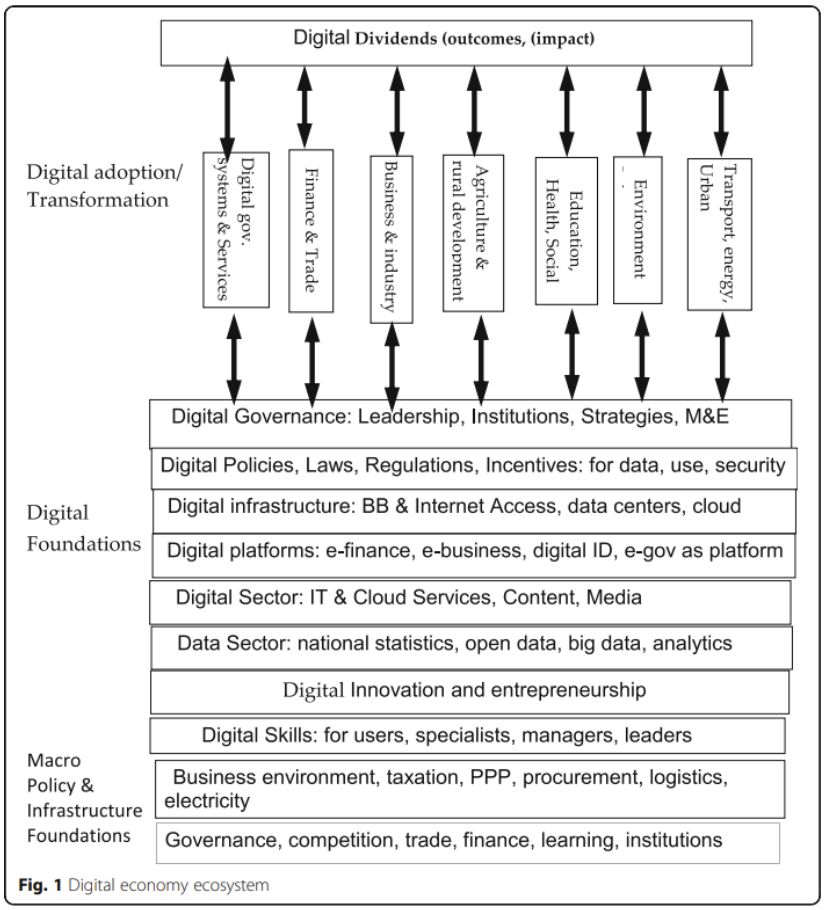
I. Core aspects or foundational aspects of the digital economy, which comprise fundamental innovations (semiconductors, processors), core technologies (computers, telecommunication devices) and enabling infrastructures (Internet and telecoms networks).

II. Digital and information technology (IT) sectors, which produce key products or services that rely on core digital technologies, including digital platforms, mobile applications and payment services. The digital economy is to a high degree affected by innovative services in these sectors, which are making a growing contribution to economies, as well as enabling potential spillover effects to other sectors.

III. A wider set of digitalizing sectors, which includes those where digital products and services are being increasingly used (e.g. for e-commerce). Even if change is incremental, many sectors of the economy are being digitalized in this way. This includes digitally enabled sectors in which new activities or business models have emerged and are being transformed as a result of digital technologies. Examples include finance, media, tourism and transportation. Moreover, although less often highlighted, digitally literate or skilled workers, consumers, buyers and users are crucial for the growth of the digitalized economy. (UNCTAD 2019)

The World Bank as examined in Hana (2020) also adopts this approach but provides specific examples of issues and aspects within it framework:

Fig 1. Digital Economy Ecosystem



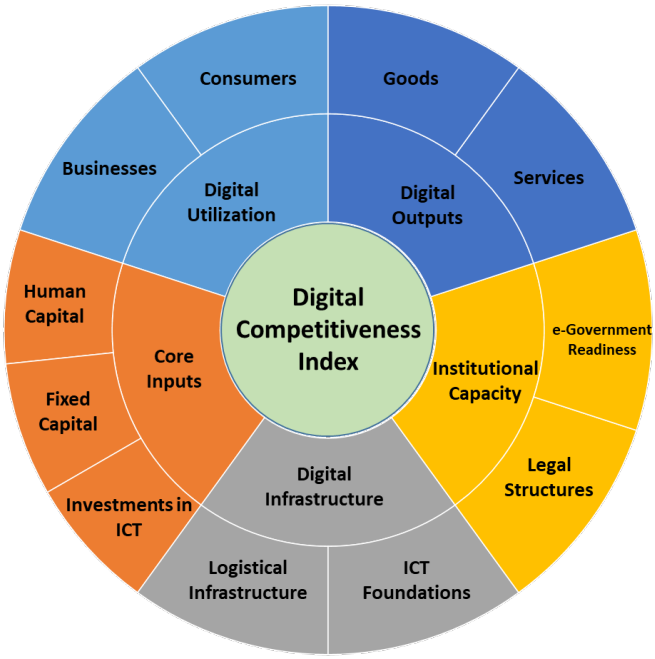
Source: Hana 2020

The ACI Digital Competitiveness Framework and Index Methodology

In conducting this review, we have determined that a tiered approach is most suitable to addressing the broad issue of competitiveness while maintaining a degree of tractability regarding data and indicators. The subsequently proposed framework thus views the digital economy broadly in-line with the previously discussed OECD, UNCTAD and World Bank definition. The Digital Competitiveness Framework consists of five categories that are further sub-divided into 11 sub-categories as depicted in Fig 2. In function, the Framework hews closer to the Digital Economy Ecosystem in Fig 1. (Hana 2020) The sub-categories and categories of the Framework are a set of mutually reinforcing factors that collectively determine the overall competitiveness of the digital economy.

In this process, we draw upon a further body of studies and statistical databases including the WEF Global Competitiveness Framework 4.0, Network Readiness Index and IMD World Digital Competitiveness Ranking, Katz and Callorda (2018) to identify the key factors and synthesize a framework that covers all the common and key issues in the digital economy and competitiveness.

Fig 2. ACI Digital Competitiveness Framework



Source: Authors

The definitions of each category and their respective sub-category are as follows:

1) **Institutional Capacity** – The role of governance is key to providing a stable, trusted environment for digital development. This environment assesses for the presence of digitally relevant legislation, legal frameworks and government processes.

   a) **E-Government Readiness**– Provision of government services online.
   b) **Legal Structures** – Presence of key legislation governing the digital economy.

2) **Digital Infrastructure** – Digital Infrastructure forms the fundamental backbone of the digital economy. It assesses the ICT infrastructure and supporting logistical infrastructure in line with the UN, OECD and ITU standards**.**

   a) **ICT Foundations** – Measures the extent of internet connectivity infrastructure in and economy.
   b) **Logistical Infrastructure** – Measures the physical infrastructure that enables flow of goods.

3) **Core Inputs** – Core Inputs refers to factors of production by both firms and people. This environment is reflected across all the surveyed literature and is essential to assessing the prevalence and level of digital technologies and human capital in the economy.

   a) **Investment in ICT –** Measures the Spending or Investment on ICT and Digitally related goods or services.
   b) **Fixed Capital –** Measures the economy's ICT and Digital goods or service volumes which provides a proxy for prevalence and level of digital technologies.

c) **Human Capital** – Household or Individual usage and skills regarding ICT and Digital goods and services which proxies for prevalence of digital savvy human capital in the economy.

4) **Digital Utilization –** Digital Utilization complements the Core Inputs environment. It assesses the adoption and usage of digital technologies by businesses and consumers.

   a) **Business –** Firm level usage and adoption of digital and ICT technologies.
   b) **Consumers –** Household or individual usage and adoption of digital and ICT technologies.

5) **Digital Outputs** – Digital Outputs accounts for the products of the digital economy or the value added by the use of digital technologies. These cover economic activity from producers of digital and ICT goods and service or rely on digital inputs.

   a) **Goods –** Volume and value of goods generated by the digital economy.
   b) **Services -** Volume and value of services generated by the digital economy.

This framework can be used to construct a composite index with the following steps:

1) For each indicator, a standardised score is calculated based on the following
2) Reverse scaled indicators are converted to positive values
3) The average scores of all indicators for each economy at the sub-category level. This is then re-standardised across all economies to obtain the sub-category scores.
4) Step 3 is repeated at the category level and overall level using sub-environment scores and category scores respectively.

Each category thus holds an equal weight of 20% in the overall index. This 20% weight for each category is divided equally between the sub-categories of each environment. All scores are relative to other economies in the study. Positive scores indicate that the economy performs better than the average of the economies and vice versa for negative scores at every level from indicator to overall index scores.

Where data is missing, the following imputation methods are applied:

1) Imputation from latest available year
2) Estimation through statistically robust trends
3) Imputation based upon comparable economies

Where none of the above are feasible, the value is set to the average of all other economies in the study.

The index currently consists of 60 indicators and reflects the year 2018. These are collected from various international sources; these include United Nations Conference on Trade and Development (UNCTAD), IMD World Competitiveness Yearbook (WCY), International Telecommunication Union Information and Communication Technology (ICT) Indicators Database, World Economic Forum Global Competitiveness Index (GCI). Other sources include Economist Intelligence Unit (EIU), Global Market Information Database (GMID) and the World Bank World Development Indicators. For full list of indicators, please refer to Annex.

The Digital Economy of Asia

In this study, the index is calculated for a heterogeneous group of 11 Asian economies to demonstrate the utility of the index in the analysis of economies at different stages of development with a broad range of socio-cultural and economic practices. The economies covered are China, Hong Kong SAR, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea (ROK), Thailand, and Vietnam. All the economies are also members of the RCEP with the exceptions of India, which withdrew from the negotiations and Hong Kong, which applied to join the grouping in 2022.

Table 1. Key Figures

	Internet Use: Selling Goods or Services (% of population)		Internet subscriptions (per 100 people)		Exports of digitally-deliverable services (% of total world)		Cross-border E-commerce (% of GDP)	
	2014	2018	2014	2018	2014	2018	2014	2018
China	3.40	5.40	57.00	90.10	3.80	4.29	1.82	4.38
Hong Kong	23.40	28.40	117.80	109.80	1.37	1.38	0.71	1.14
India	0.20	0.70	4.65	5.40	4.29	4.32	0.35	1.00
Indonesia	0.30	1.40	6.08	12.70	0.29	0.30	0.19	1.17
Japan	22.50	29.50	103.80	108.80	3.34	3.46	1.31	1.70
Malaysia	14.70	16.90	88.60	79.00	0.41	0.35	0.22	0.52
Philippines	3.30	6.30	28.69	36.80	0.70	0.75	0.14	0.43
Singapore	27.00	39.80	89.12	84.70	2.85	3.65	0.31	0.53
ROK	51.30	61.90	127.50	145.60	1.24	1.27	2.28	4.46
Thailand	1.60	4.60	27.10	39.30	0.40	0.41	0.28	0.59
Vietnam	13.00	21.60	66.30	86.80	0.04	0.04	0.35	0.88

Source: Euromonitor, EIU, UNCTAD and World Development Indicators

With reference to Table 1, these economies all feature increasing usage digital technologies in commercial activities. With high or rapidly growing internet usage across the region, this growth has not been constrained to the developed economies like Japan, South Korea and Singapore. Populations in countries such as Philippines, Vietnam and Indonesia have made great strides in the use of the internet for selling goods or services.

These developments extend beyond the domestic economies. Most interestingly, in the areas of digitally-deliverable services and e-commerce. This new dynamic to a sector that is traditionally considered non-tradeable in economics is critical for developing nations. The use of digital technology has enabled a new and often large segment of these economies to reach global markets particularly the numerous Small and Medium Enterprises (SMEs) in these economies. (OECD 2017) Furthermore, the relationship between trade in goods and services has become increasingly intertwined with implications that remain to be more thoroughly studied. (Ferencz 2019) This most clearly characterised by the rapid growth of e-commerce in the economies of this study. It is expected that this trend will be further accelerated post-COVID. The growing share of digitally-deliverable services exports held by these economies makes the development of practical analytical frameworks all the more important in seeking to analyse the factors driving digital competitiveness.

Results

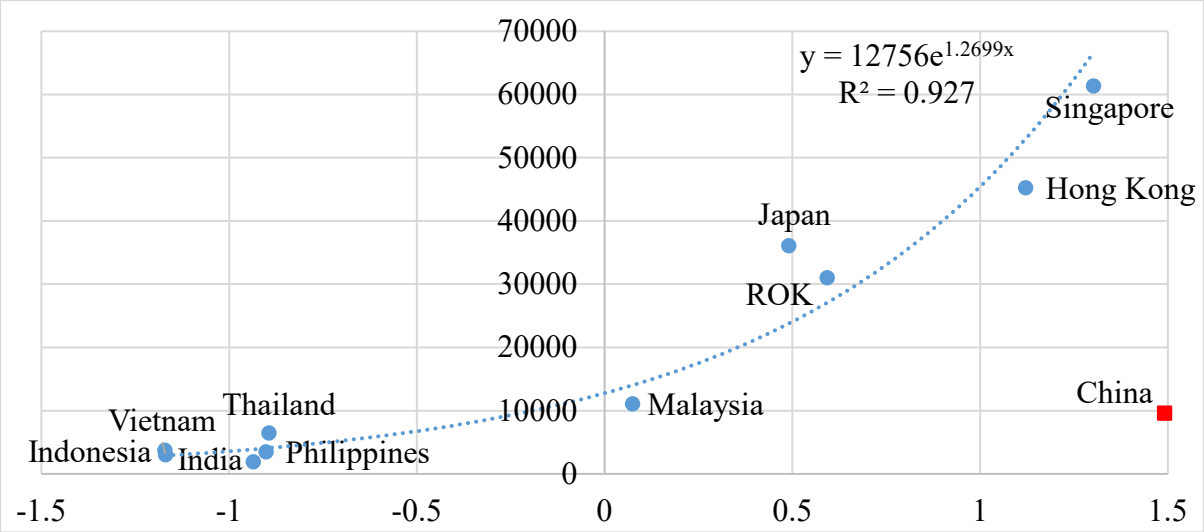
Table 2. Digital Competitiveness Index Scores[1]

	Overall	Institutional Capacity	Digital Infrastructure	Core Inputs	Digital Utilization	Digital Output
China	1.491	0.359	0.595	2.238	0.391	2.685
Hong Kong	1.121	0.554	1.085	1.039	1.457	0.577
India	-0.935	-1.703	-0.512	-0.859	-0.560	-0.298
Indonesia	-1.171	-0.522	-0.896	-1.157	-1.313	-1.033
Japan	0.490	0.793	1.201	0.081	0.297	-0.311
Malaysia	0.074	0.690	-1.025	0.150	0.707	-0.209
Philippines	-0.902	-0.763	-1.538	-0.748	-0.342	-0.401
Singapore	1.302	1.722	1.714	0.954	0.862	0.221
ROK	0.593	0.724	0.308	-0.150	1.081	0.529
Thailand	-0.894	-0.427	-0.264	-0.536	-1.900	-0.631
Vietnam	-1.170	-1.427	-0.668	-1.013	-0.680	-1.129

Source: Authors

Setting aside China that will be subsequently discussed, the results of the overall index correlates well with the level of real GDP per capita of the economy depicted in Fig 3. Taking real GDP per capita as a shorthand for the level of development, there is clear demonstration of the importance digital economic competitiveness towards future development and the relevance of this framework for considerations of macroeconomic policy.

Fig 3. Correlation between GDP per capita (constant 2015 US$) and Overall Score

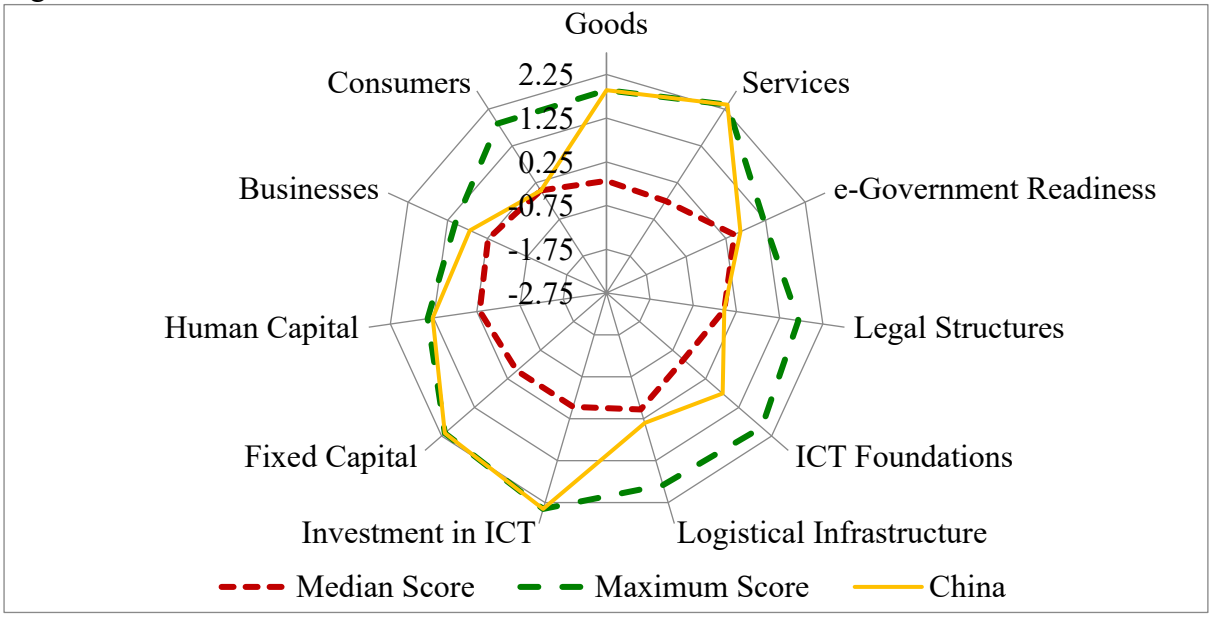


Source: Authors

The utility of adopting a tiered approach to designing the framework has also been demonstrated. China as the top overall performer and an outlier to the general trend above illustrates this. The overall performance of China is largely a consequence of the large lead it has in terms of Digital Output and Core Inputs. These are attributable to the large size of its domestic economy far dwarfing those of other economies in the study. With respect to the other categories, China lags behind other top and mid performers.

[1] For full set of results and detailed analysis for each economy at the sub-category and indicator levels, please see Tan et al (2022).

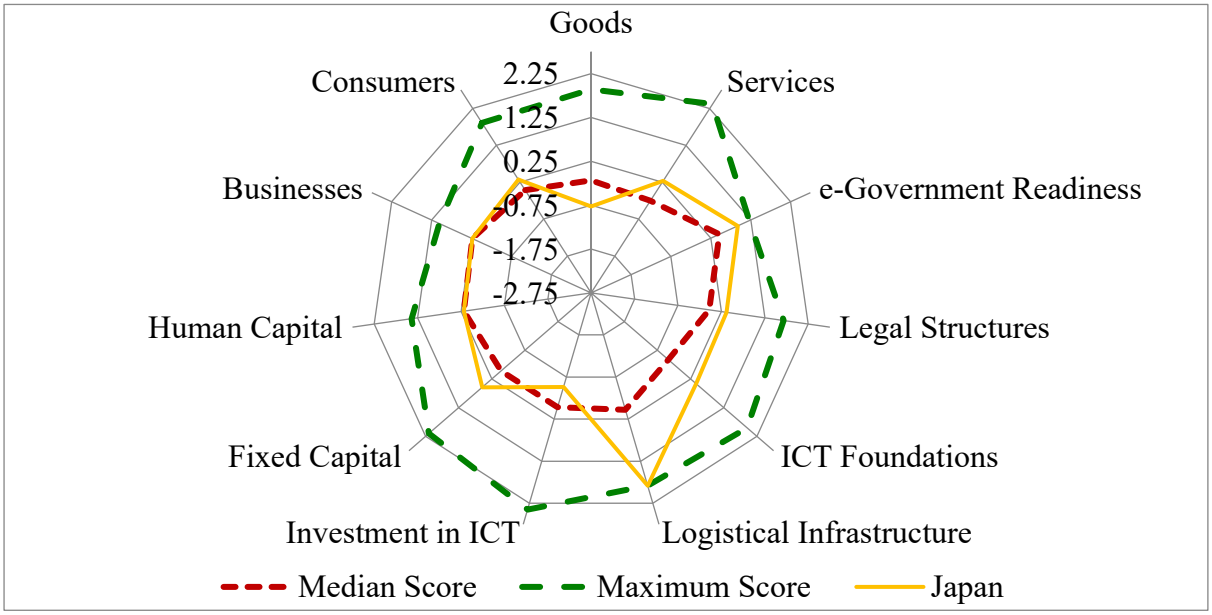
Fig 4 China vs Median and Max



Source: Authors

The tiered approach allows for further analysis into the underlying factors hampering overall digital economic competitiveness. In breaking down the performance of China at the sub-category level in Fig 4 there is an observed weakness in Consumer utilization in spite of China's growing reputation as a technological leader. This weakness most likely stems from known regional disparities in access to internet within China a point reflected also within its ICT foundations score. (Liu et al. 2017)

Fig 5. Japan vs Median and Maximum of ASEAN+



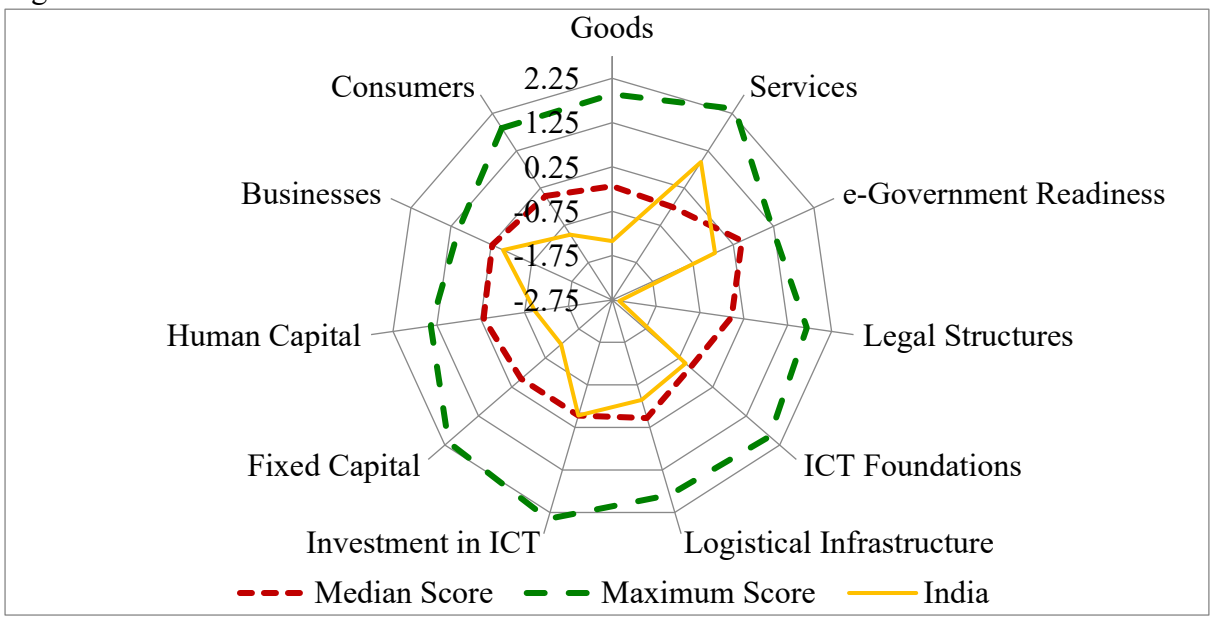
Source: Authors

Japan as well provides an interesting scenario where the Digital Output score is negative despite positive performances in all other categories. Japan as a long established technological leader having such a result was surprising. To explain this required analysing the sub-category level in Fig 5. This deeper analysis finds several notable constraints to the competitiveness of

the Japanese digital economy. One key factor is the tendency of Japanese technology firms to be domestically oriented. This applied to both Goods and Services. (Holroyd 2017 & Pick and Sarkar 2015) Additionally, Consumer and Business uptake of newer digital economy technologies like e-payments are traditionally slow. (Chang et al 2021, The Economist 2021) Also hampering the performance of Japan are large regional ICT infrastructure disparities and demographic issues. (Pick and Sarkar 2015) These may be underpinned by the high price of mobile broadband in Japan, which dis-incentivizes investing in ICT.

The results at the overall level are thus only meaningful when analysed in the context of the categories. To reduce the digital economy into a single measure would have provided limited analytical value. It would also be erroneous to conclude that it would be sufficient to focus on specific aspects or categories. The following detailed analysis of India provides the best demonstration of the interplay between factors present in digital economies and validates the equal weights approach.

Fig 6. India vs Median and Maximum



Source: Authors

Except for Services in the Outputs category, India performs below median for all sub-categories. India's above median performance in Services is a result of relatively high level of exports of ICT and digital services but its weaker performance in Goods is attributable to relatively poorer export performance of high-tech and ICT goods. This lop-sided performance is reflective of India's strength in services but weakness in manufacturing capacity. In the past 13 years, India's manufacturing sector share of employment increased by just one percentage point, compared to a five-point increase for the services sector.(Dhawan and Sengupta 2020) Despite the large population in India, a lack of available Human Capital for its electronic manufacturing is a challenge facing its ICT goods sector. Figures sourced from government backed National Development Corporation, India suggest India faces a manufacturing skills gap of nearly 90 million workers by 2022. (Moavenzadeh et al. 2013)

Further hampering growth in manufacturing is India's relatively poor performance in Logistical Infrastructure. Domestic regional disparities need to be narrowed and infrastructure spending needs to increase to more sustainable levels if infrastructure performance is to be improved; its

historical investment of 1 percent of GDP in transportation infrastructure every year is insufficient. (Mathur et al 2020)

Conclusion

The distinction between the digital economy and the wider economy is a blurry one. It may well be as noted in the 2019 Joint Research Report by the Australian and New Zealand Productivity Commissions that in modern economies, the two are increasingly synonymous. The results of this study do lend some validity towards that view, as there is a trend towards more digitally competitive economies also being more economically developed. That does not subtract from the need to understand the underlying factors of the digital economy and in fact reinforces it as economies grapple with this modern dimension of development.

The key contribution of this study has been to present a framework and quantification strategy that allows the user to analyse the issues underpinning digital economic competitiveness. The use of a heterogeneous group of Asian economies has served to highlight the value of this framework as an analytical tool. The study has found that even economies that are assumed to be at the technological frontier such as Japan and China are not immune to developmental challenges in the digital economy.

Further detailed analysis enabled by this framework have highlighted that one of the key challenges of the digital economy is one of unequal access. This digital divide manifests itself in many forms across the study, within individual economies this ranges from unequal access due by geographical boundaries to more social aspects such as demographics or economic disparities. There is also the issue of broader international disparities in terms of foundational issues of infrastructure and institutional setting.

The policy implications of this study are thus many. On the international stage, the recognition that developing economies require infrastructure assistance has gain broad recognition, the creation of the Asian Infrastructure Investment Bank, the Belt and Road initiative as well as the Global Investment and Infrastructure Partnership is evidence of such. The challenge for the policymaker is thus to ensure that the development of such infrastructure is equitable domestically.

A more challenging issue is the development of institutional capacity. The lack of a globally agreed upon standard and understanding for the digital economy has made the development of key legislation difficult. There is some headway in these through the vehicle of a growing body of digital economy agreements. These agreements are the digital counterparts of traditional preferential agreements and offer a way for economies to arrive at mutually agreeable standards on governing the digital economy.

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Annex

No.	Indicator	Unit	Source
1	**Digital Outputs**		
1.1	**Goods**		
1.1.01	High-technology exports as proportion of manufactured exports	Percentage	World Bank WDI
1.1.02	Total Value of E-Commerce as proportion of GDP	Percentage	Euromonitor Passport, WB WDI
1.1.03	M-Commerce (USD Current Price) as Proportion of GDP	Percentage	Euromonitor Passport, WB WDI
1.1.04	Exports: Share of ICT goods trade in total merchandise trade	Percentage	UNCTAD
1.2	**Services**		
1.2.01	Exports of digitally-deliverable services, value	USD at current prices in millions	UNCTAD
1.2.02	Exports of digitally-deliverable services, value Growth rate (over previous period)	Percentage	UNCTAD
1.2.03	Exports of digitally-deliverable services, Percentage of total trade in services	Percentage	UNCTAD
1.2.04	Exports of digitally-deliverable services, Percentage of total world	Percentage	UNCTAD
1.2.05	Online Retail sales (US$m) as proportion of GDP	Percentage	EIU, WB WDI
1.2.06	Service Revenue: Telecommunication Services (proportion of GDP)	Percentage	ITU
1.2.07	Exports of ICT services value in US dollars at current prices in millions	USD at current prices in millions	UNCTAD
1.2.08	Exports of ICT services, Growth rate (over previous period)	Percentage	UNCTAD
2	**Institutional Capacity**		
2.1	**e-Government Readiness**		
2.1.01	E-Participation Index	Index Value	UN E-government survey
2.1.02	Online Service Index	Index Value	UN E-government survey
2.1.03	Technical Pillar of ITU's Global Cybersecurity Index	Index Value	ITU
2.1.04	Organizational Pillar of ITU's Cybersecurity Index	Index Value	ITU
2.1.05	Capacity Building Pillar of ITU's Global Cybersecurity Index	Index Value	ITU
2.1.06	Cooperation Pillar of ITU's Global Cybersecurity Index	Index Value	ITU
2.1.07	Cross-border paperless trade facilitation	Index Value	UN Global Survey on Digital and Sustainable Trade Facilitation
2.1.08	Paperless Trade facilitation	Index Value	UN Global Survey on Digital and Sustainable Trade Facilitation
2.2	**Legal Structures**		
2.2.01	Online Consumer Protection legislations	Binary	UNCTAD
2.2.02	Legal framework's adaptability to digital business models (1-7)	Ordinal Scale	World Economic Forum Global Competitiveness Index
2.2.03	Legal Pillar of ITU's Global Cybersecurity Index	Index Value	ITU

3	**Digital Infrastructure**		
3.1	**ICT Foundations**		
3.1.01	Coverage of mobile network (per 100 people)	Number per 100 people	ITU
3.1.02	Service Penetration Rate: Population Covered by at Least an LTE/WiMAX Mobile Network	Percentage of Population Covered by at Least an LTE/WiMAX Mobile Network	ITU
3.1.03	Service Capacity: Lit and Equipped International: Bandwidth Capacity	Mbit/sec	ITU
3.1.04	Secure Internet servers (per 1 million people)	Number per 1 million people	WB WDI
3.1.05	Internet bandwidth speed	Average connection speed in Mbps	IMD World Competitiveness Online
3.2	**Logistical Infrastructure**		
3.2.01	Logistics Performance Index Rankings	Index Value	World Bank LPI
3.2.02	UPU Integrated Index for Postal Development	Index Value	UPU
4	**Core Inputs**		
4.1	**Investment in ICT**		
4.1.01	Service or Product Price: Mobile Broadband with High Usage: Base Plan Price [R]	USD at current prices	ITU
4.1.02	Investment: Telecommunication Services	USD at current prices	ITU
4.1.03	Imports of digitally-deliverable services, Growth rate (over previous period)	Percentage	UNCTAD
4.1.04	Imports of digitally-deliverable services, Percentage of total trade in services	Percentage	UNCTAD
4.1.05	Imports: Share of ICT goods trade in total merchandise trade	Percentage	UNCTAD
4.1.06	ICT goods imports (% total goods imports)	Percentage	WB WDI
4.1.07	ICT sector: Market demand (% real change pa)	Percentage	EIU
4.1.08	ICT sector: market demand (US$ at 2005 constant prices)	USD billions at 2005 constant prices	EIU
4.1.09	Total IT spending (% of GDP)	Percentage	IDC
4.2	**Fixed Capital**		
4.2.01	Personal computers (per 100 people, US=100)	Number per 100 people	ITU
4.2.02	Subscriptions: Mobile Broadband: Active	Unit	ITU
4.2.03	Internet subscriptions (per 100 people, US=100)	Number per 100 people	EIU
4.2.04	Broadband subscriptions (share of world total)	Percentage	EIU
4.2.05	Subscriptions: Fixed Broadband Internet: Equal or Above 10Mbit/s	Percentage	ITU
4.2.06	Subscription Density: International Internet Bandwidth per Internet User	Bit/sec	ITU
4.2.07	Subscription Density: Internet Users Portion	Percentage	ITU
4.3	**Human Capital**		
4.3.01	Subscriptions: Fiber Internet to the Home	Unit	ITU

4.3.02	Digital skills among active population, 1-7 (best)	Ordinal Scale	WEF Global Competitiveness Index
4.3.03	Smartphone possession (% of households)	Percentage	Euromonitor Passport
4.3.04	Tablet possession (% of households)	Percentage	Euromonitor Passport
5	**Digital Utilization**		
5.1	**Businesses**		
5.1.01	Use of big data and analytics (0 to 10)	Ordinal Scale	IMD World Competitiveness Online
5.1.02	Businesses using a Computer (% of businesses)	Percentage	Euromonitor Passport
5.1.03	Businesses using the Internet (% of businesses)	Percentage	Euromonitor Passport
5.1.04	Internet Use: Selling Goods or Services (% of population)	Percentage	Euromonitor Passport
5.2	**Consumers**		
5.2.01	Traffic Volume: Mobile Broadband Internet: Within the Country	Exabyte	ITU
5.2.02	Percentage of Population Using The Internet Away from Home or Workplace	Percentage	Euromonitor Passport
5.2.03	Internet Use: Internet Banking (% of population)	Percentage	Euromonitor Passport
5.2.04	Internet Use: Telephoning or Making Video Calls (% of population)	Percentage	Euromonitor Passport
5.2.05	Frequency of Internet Access: Daily (% of population)	Percentage	Euromonitor Passport
5.2.06	Service Capacity: International Internet: Bandwidth Capacity	Mbit/sec	ITU

[R] Indicates Reversed Indicator