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IPR protection for Asian development: Opportunities and challenges from global value chains and the digital economy: Singapore

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IPR protection for Asian development

Opportunities and challenges from global value chains and the digital economy – Singapore

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2.1 G lobal value chain: the importance of intellectual property

Value chains refer to the full range of activities that firms undertake to bring a product or a service from its conception to its end use by final consumers (De and Miroudot, 2013). Global value chains (GVCs) emerged in the mid-1980s when firms in many industries focused on core competencies and outsourced other activities across national boundaries. Baldwin (2013) identified two reasons for the rise of GVCs: (i) the information and communications technology revolution made it possible to coordinate complexity at a distance, and (ii) the vast wage differences between developed and developing nations made the separation of labour profitable. Economically, the GVCs represent the process of ever-finer specialisation and geographic fragmentation of production. Within each GVC is always an incentive by the GVC's organiser, often a multinational corporation, to move its labour-intensive portions to a place with lower wages. This partially explains why the world's manufacturing sites first moved to Japan and the Republic of Korea (henceforth, Korea) in the 1960s, and to Taiwan, Singapore, Hong Kong, and then to China and Southeast Asian countries in the last four decades.

Recent economic studies concerning the GVCs have focused on value distribution. After studying 560 GVCs from 1995 to 2008, Timmer et al. (2014) found that the GVCs provide a similar pattern of value addition. The distribution of value-added by each location along the GVC timeline presents a U-shaped curve, which some scholars refer to as the 'smiling curve' (Shin et al. 2012; Li et al. 2010; Wang and Jia 2010; Chen 2004) (Figure 2.1). The curve reveals that the greatest value is captured by upstream (research and development [R&D]) and downstream (marketing) firms, and the lowest value is captured by the assembly firms located in the middle of GVCs (Shin et al. 2012). Multinational corporations (MNCs) have control over the two ends of the curve; they possess product planning capabilities and market access advantages, and protect them with intellectual property rights (IPR). The MNCs also control manufacturing through contractual agreements

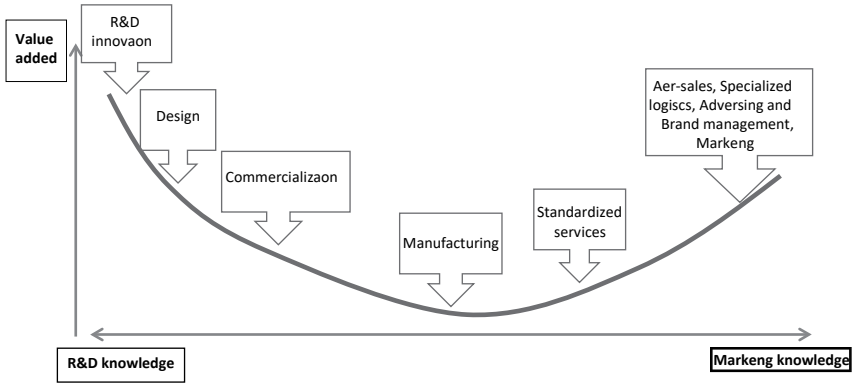

Figure 2.1 The Smiling Curve of Value Creation.

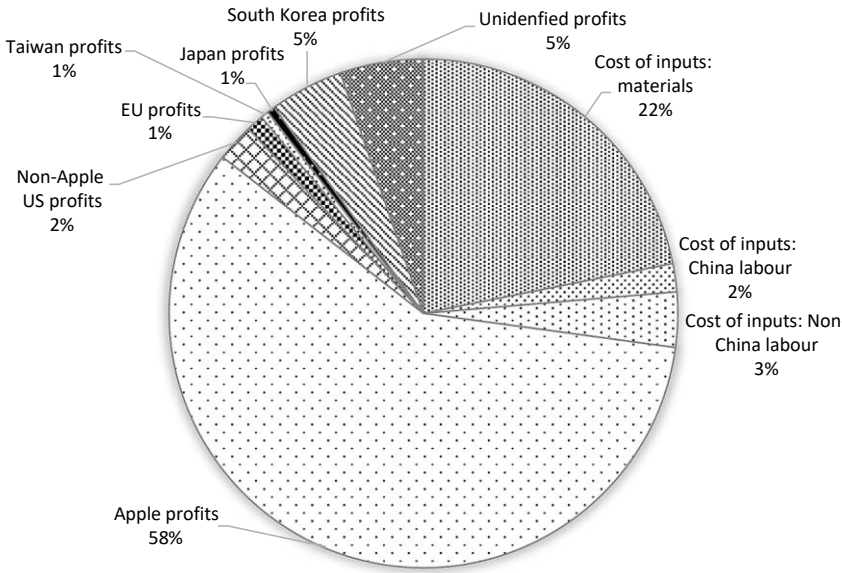

Figure 2.2 Distribution of Value for iPhone, 2010.

with original equipment manufacturers, so they have the final say in the distribution of value derived from the GVCs (Chen 2004). A general trend is that the smile is getting deeper as Timmer et al. (2014) had found that value-added shares of low-skilled workers in emerging economies have been declining from 1995 to 2008.[1]

A typical example of the smiling curve is Apple. According to the empirical study by Kraemer, Linden, and Dedrick (2011), Chinese labour assembles Apple products. Still, it accounts only for 1.8% of the total value for iPhone (Figure 2.2) and 2% of the total value for iPad (Figure 2.3). Most profits go to product development and branding (Apple's profit accounts for 58.5%

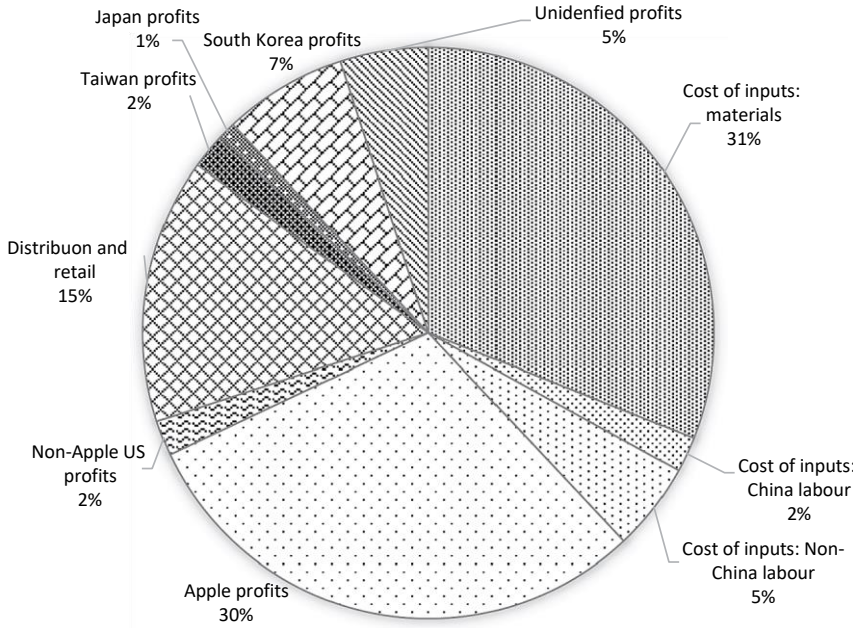

Figure 2.3 Distribution of Value for iPad, 2010.

and 30%, respectively). Kraemer et al. (2011) further clarified that 'it is a common misconception that China, where the iPad is assembled, receives a large share of money paid for electronics goods. That is not true of any name-brand products from the US' (Kraemer et al. 2011, p. 5). Although the study's finding is overwhelming, one should be careful about generalising a conclusion that also applies to other GVCs. For instance, Dedrick, Kraemer, and Linden (2010) compared the value distribution, particularly the profits from innovation, in the GVCs of iPad and personal computers (Lenovo and HP), and found that the gross margins for Apple from iPad are higher than those earned by HP and Lenovo from personal computers. Relatively, either HP PC's or Lenovo PC's smiling curve is less deep than that of Apple.

As Mudambi (2008) suggested, multinational corporations (MNCs) can control the GVCs by concentrating on R&D and marketing while outsourcing low value-added assembly and processing to firms in emerging economies. However, economic literature stops here and does not ask how such a 'control' can be happening, namely, who regulates the GVCs, particularly who defines the rules as how much each party located at the GVCs can gain? And how? We, therefore, turn to the literature of regulation.[2] Traditionally, states assume the role of regulators. However, private actors, particularly the MNCs, play an essential role in regulatory capitalism, including the regulation of the GVCs, although sometimes the underpinning power relations behind the value distribution of the GVCs are not well spelled out.

After researching Chinese firms at the GVCs, Chen (2004) argued that in the GVCs the MNCs are the regulators while the Chinese original equipment manufacturers (OEMs) are the 'regulatees'. Being a supplier for the MNCs located at the bottom of the smiling curve leads to Chinese OEMs' dependence on their multinational partners in the GVCs (Morck et al. 2008).

The MNCs regulate their GVCs through IP laws. Therefore, the MNCs often have much stronger bargaining power as opposed to the manufacturers. The MNCs create a legal framework to protect all forms of intangibles and tangibles as property at all ends of the GVCs. The IP system confers exclusive rights to the IP owners. Any other person or company that desires to use these intangible resources must ask for authorisation from the owner through a licensing agreement. However, IP is a territorial right, as defining the proper scope and level of IP protection is a state's sovereign decision. If the MNCs' creations or brands cannot be protected in the country where they manufacture and/or sell the products, they cannot collect the profits of the GVCs. To prevent this from happening, the MNCs have been motivated to ratchet up IP protection standards globally. According to Sell (2011), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) resulted from powerful lobbying by US-based MNCs that wished to ratchet up international IP protection standards to protect their markets.

In sum, understanding who regulates the GVCs and how such regulation has been achieved through IPR is important for Asian governments to reflect on when trying to upgrade or improve their positions at the GVCs.

2.2 T he Singapore economic model and their position in the GVC

2.2.1 In general

Singapore has been one of the world's important ports since the 19th century. Until today, shipping industry-related services are still an essential part of Singapore's economy. After the country's separation from Malaysia in 1965, it began to work on industrialisation. Since the 1980s, the young country has transformed itself from a labour-intensive economy into a highly skilled and technology-driven one. After experiencing its first economic recession in 1985 after independence, the Singaporean government redirected its economic development from manufacturing to services. In the new millennium, it is striving to become a creative and innovative Smart Nation. Among other efforts, Singapore launched in 2013 the IP Hub Masterplan and Update to the IP Hub Masterplan 2017. Figure 2.4 illustrates Singapore's economic development agenda.

Regarding economic structure, Singapore has developed its sophisticated service industries, such as financial, information technology, medical, electronics, aviation, and education services. From 1973 to 2013, Singapore's gross domestic product (GDP) increased by 37 times, from S$8,745 million to S$324,592 million (based on 2005 constant prices). The average annual growth rate during this period was 7.2%. According to the International

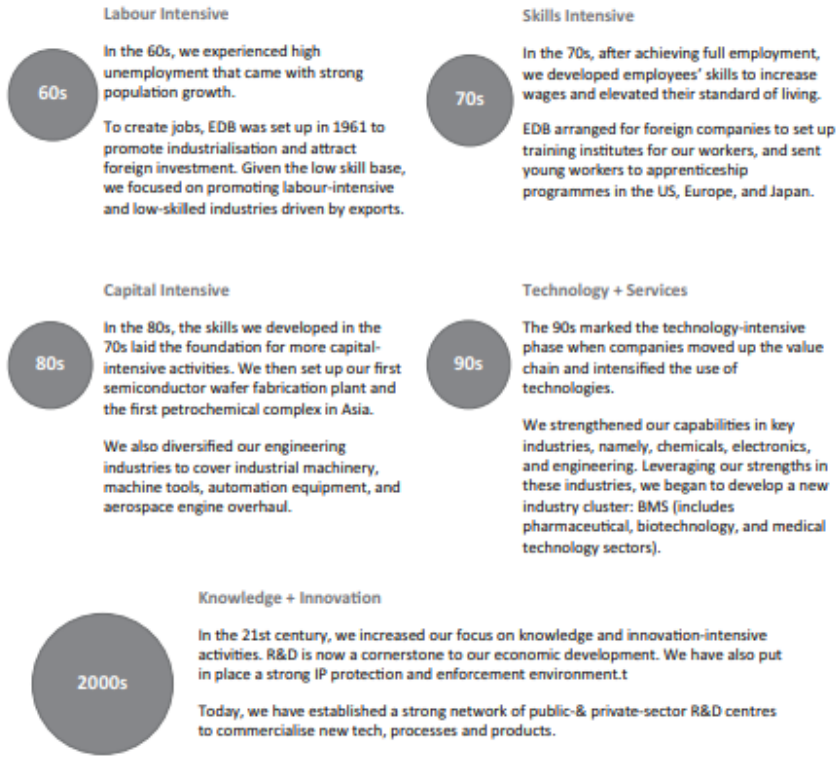

Figure 2.4 Singapore's Economic Transformation (1960s onward).

Monetary Fund, in 2017, the country's per capita GDP ranked third globally (Toh 2017).

According to the Ministry of Finance:

> Singapore's economic structure reflects the realities of a small country. It is diversified across manufacturing and services, but both are heavily exposed to global markets. As a city-state with a population of four million, businesses have far greater incentive to serve global markets than domestic consumption. Operating revenues, at 15% of GDP, are lower than in any developed economy. The vast majority of businesses and households enjoy effective tax rates that are the lowest in Asia.
>
> (WSJ Asia 2009)

One 2018 report by the ASEAN–Japan Centre on Singapore's role in the GVCs shows that the largest share of value addition in Singapore belongs to foreign trade. The share of foreign value-added in gross exports varies from industry to industry, with an all-industry average of 62% (Fujita 2018). Among ASEAN countries, Singapore's share of foreign value-added is 20% higher than the next largest economies, Malaysia and Viet Nam (Fujita 2018). Table 2.1 illustrates the breakdown of foreign value-added.[3]

Table 2.1 Structure of Value-Added Exports from Singapore, by Sector and by Industry, 2015

Sector and Industry	*Gross Exports, Billion US$*	*Domestic Value Added (DVA), Billion US$*	*Foreign Value Added (FVA), billion US$*	*Share of FVA in Total Gross Exports, %*
Total	**356.2**	**137.1**	**219.1**	**61.5**
Primary	**1.7**	**1.1**	**0.6**	**34.3**
Agriculture, hunting, forestry, and fishing	1.7	1.1	0.6	34.3
Secondary	**261.3**	**78.2**	**183.1**	**70.1**
Food, beverages, and tobacco	6.1	2.4	3.7	60.7
Textiles, clothing, and leather	2.8	0.9	1.9	67.2
Wood and wood products	0.7	0.3	0.4	56.7
Publishing, printing, and reproduction of recorded media	5.4	2.6	2.7	50.7
Coke, petroleum products, and nuclear fuel	43.8	4.4	39.4	89.9
Chemicals and chemical products	28	14.3	13.7	48.9
Rubber and plastic products	5.4	2.1	3.4	61.7
Non-metallic mineral products	1	0.4	0.6	56.8
Metal and metal products	13.8	4.8	9	65.4
Machinery and equipment	18.1	7.9	10.2	56.3
Electrical and electronic equipment	113.9	27.8	86.1	75.6
Precision instruments	13	6	7	54.1
Motor vehicles and other transport equipment	8.6	4.2	4.4	51.3
Other manufacturing	0.8	0.1	0.7	89.5
Tertiary	**93.1**	**57.7**	**35.4**	**38**
Electricity, gas, and water	0.1	0.1	0	17.8
Construction	2	1.2	0.8	39.9
Trade	12.3	8.3	4	32.8
Hotels and restaurants	5.5	4	1.5	27.1
Transport, storage, and communications	25.9	12.1	13.8	53.2

(*Continued*)

Table 2.1 (Continued)

Sector and Industry	*Gross Exports, Billion US$*	*Domestic Value Added (DVA), Billion US$*	*Foreign Value Added (FVA), billion US$*	*Share of FVA in Total Gross Exports, %*
Finance	9.9	7.2	2.7	27.7
Business activities	28.5	18.5	9.9	34.8
Education	1.7	1.4	0.3	19.5
Health and social services	1.2	0.8	0.4	31.9
Community, social, and personal service activities	5.1	3.4	1.7	33
Other services	0.9	0.7	0.2	22.7

Source: Fujita (2018).

A series of rankings have recognised the Singapore government's efforts to make the country more friendly to foreign businesses. In 2018, the Index of Economic Freedom of the Heritage Foundation (2018) ranked the country as the world's second most open economy. It is also the world's second most pro-business regime, according to the World Bank's *Doing Business* report, only next to New Zealand (World Bank 2018).

2.2.2 Digital economy

In the new millennium, Singapore has been striving to become a creative and innovative Smart Nation. The value of digitalisation is immense; Microsoft estimated that the digital economy will contribute an additional US$10 billion to Singapore's GDP by the end of 2021. The Committee on the Future Economy, formed to chart the next phase of Singapore's economic growth, has affirmed the importance for Singapore to take the lead in the global digital economy. Four key areas were identified for development: immersive media, artificial intelligence, cybersecurity, and the Internet of Things. On the enterprise front, firms in Singapore are also increasing their investments in digital assets to enhance their digital capabilities. Specifically, firms' gross capital expenditure on digital fixed assets rose at a compounded annual growth rate of 7.1% in 2013–2015, thereby resulting in a significant accumulation of digital fixed assets among firms over this period. In tandem with their digital assets investments, firms are also increasingly adopting digital tools in their day-to-day business activities. For instance, according to the Infocomm Media Development Authority, a higher share of enterprises uses e-payment systems and mobile services to do business.

For a city-state such as Singapore where everything is conveniently concentrated, and people enjoy shopping as part of their social life, the digital economy is slowly emerging.

2.3 IP system in Singapore

2.3.1 The importance of IP

Singapore has been a latecomer in the IP game. It did not accede to the Paris Convention and the Berne Convention until it reached significant economic development: 1994 (effective 1995) and 1998 (when it declared that it availed itself of the faculties provided for in Articles II and III of the Appendix for a developing country [Special Provisions Regarding Developing Countries] until 2004), respectively. According to the World Integrated Trade Solution, Singapore's GDP per capita in 1990–1994 was US$11,864; US$14,505; US$16,144; US$18,302; and US$21,578, respectively.[4] From around that time, the Singapore government realised the importance of IP: it could elevate its position from the bottom to the higher end of the GVCs. Thus, it endeavoured to raise its IP protection standards in its domestic laws to comply with the TRIPS standards. Singapore has made huge progress ever since. The main driver of this progress is, without doubt, the visionary Singapore government. Many international organisations have ranked Singapore as the best performer in IP protection. According to Fujita (2018):

> Singapore occupies both ends of the (smiling) curve, in other words, the highest value-added parts of production chains. The assembly and manufacturing parts of the GVC curve have the potential to be upgraded, given the level of technology and GVC participation of the largest export industry, electrical, and electronic equipment.

2.3.2 Singapore's role in specific GVCs

This conclusion can be further supported by looking at Singapore's role in specific GVCs. Take the growing medical technology market, for example. With its strategic location in Asia, Singapore has attracted over 60 multinational medical technology companies to undertake various activities from regional headquarters and manufacturing to R&D. The multinational companies have relied on the country's design and engineering capabilities, its base of automation suppliers, and high-quality assurance standards to manufacture high-value medical products. In addition to manufacturing, 50 regional headquarters from the world's leading medical technology firms are based in Singapore, from which they are implementing their 'Asia strategy' to expand into the region (EDB Singapore 2017, 2018). The pharmaceutical industry has been well known for its demands for a high level of IP protection.

Qualcomm, the world giant in the wireless telecommunications industry, has also located its patent holding in Singapore. Qualcomm has moved its Qualcomm CDMA Technologies non-US headquarters to Singapore. The tax incentives in Singapore are the primary reason for the move. During the third quarter of fiscal year 2018, Qualcomm entered into a new tax incentive agreement with Singapore that reduced the tax rate from March 2017 through March 2022, provided that the specified employment and investment criteria in Singapore are met (Qualcomm 2018).

In 2017, Qualcomm and TDK Corporation formed a joint venture, RF360 Holdings Singapore PTE. Ltd. The joint venture is 51% owned by Qualcomm Global Trading Pte. Ltd. (Qualcomm Global Trading), a Singapore corporation and wholly owned subsidiary of Qualcomm, and 49% by EPCOS AG, a German wholly owned subsidiary of TDK. The joint venture will enable Qualcomm's RF front-end (RFFE) business to deliver RFFE modules and RF filters into fully integrated systems for mobile devices, the Internet of Things, automotive applications, connected computing, and more. F360 Holdings will be a Singapore corporation and will have a global presence with R&D and manufacturing and/or sales locations in Europe and Asia, and its headquarters in Munich, Germany (Qualcomm 2017). Another similar story is MediaTek, a Taiwanese company specialising in chipset technology for smart TVs, voice assistant devices, Android tablets, feature phones, optical and Blu-ray DVD players, and mobile phones. The company is headquartered in Taiwan, with sales and research subsidiaries in Singapore, China, Hong Kong, India, United States, Japan, Korea, England, Finland, Sweden, France, Holland, and Dubai. According to its 2017 annual report, the Singapore government is the largest stakeholder of MediaTek. Also, the company established four affiliations in Singapore, with one holding MediaTek's IP rights (MediaTek 2017).

Clearly, an effective IP protection system is a prerequisite for multinational companies' headquarters in Singapore. Dyson, which is now relocating its global headquarters to Singapore, is another example (Jack 2018). Dyson has made it clear that the centre of gravity now lies in Asia, where it sees the biggest growth opportunities. It is a strategic plan for the smart allocation of resources along the GVC because only 2%–3% of the supply chain is in Europe, and that goes east and not west (BBC 2019).

2.3.3 IP authorities

The IP authorities in Singapore include the Ministry of Law and its Intellectual Property Office of Singapore, Attorney-General's Chambers, and specialised IP court and judges.

2.3.3.1 Ministry of law

The Ministry of Law has its Intellectual Property Policy Division in charge of IP policies and legislation (specifically patents, trademarks, copyright, registered designs, plant varieties, geographical indications, and trade secrets), and IP-related industrial policies. The Ministry of Law's policy position is to maintain an IP regime that is balanced, well-regarded internationally, fosters the growth of a vibrant IP services sector, and supports value creation (Ministry of Law 2018).

2.3.3.2 Intellectual Property Office of Singapore (IPOS)

IPOS is mainly responsible for implementing IP laws, including providing advice on IP laws, maintaining the IP registers, and engaging businesses on their IP needs (Ministry of Law 2018).

2.3.3.3 Attorney-General's Chambers

The Attorney-General's Chambers (AGC) is mainly responsible for IP enforcement. It performs this function by playing the role of public prosecutor in criminal cases concerning IP infringement. In addition to enforcement, the AGC is also responsible for international negotiations related to IP. For instance, AGC's International Affairs Division represents Singapore at bilateral and multilateral negotiations, and in international disputes (AGC 2018).

2.3.4 Judicial system: specialised IP court and judges

In addition to traditional civil litigation and criminal prosecution, alternative dispute resolution (ADR) and specialised IP court are two recent trends in Singapore's judicial system related to IP. The World Intellectual Property Organization (WIPO) Arbitration and Mediation Centre collaborates with the Ministry of Law in Singapore to promote the use of ADR in solving IP disputes in Singapore. Alternatively, the Ministry of Law designated the WIPO Centre as a mediation service provider in Singapore (National Archives of Singapore 2017). Based on such consensus, WIPO and the IPOS have developed (i) a mediation option for trademark and patent proceedings and (ii) an expert determination option for patent proceedings pending before IPOS. Both of them are voluntary and follow WIPO rules.[5]

In 2002, Singapore established a specialist IP court within the High Court with four designated IP judges. All IP cases are managed by a designated senior assistant registrar who conducts all pre-trial conferences and hears all summonses for directions applications. A designated assistant registrar is also assigned to each IP case to hear and decide on all interlocutory applications and conduct inquiries for post-trial assessment of damages and accounting of profits. Furthermore, Singapore revised its Constitution (Article 94[4]) in 2014 to allow the appointment of persons for a fixed period whom the Chief Justice considers having appropriate experience and qualifications to be associate judges of the Supreme Court. The Singapore International Commercial Court (SICC), a division of the High Court and part of the Supreme Court of Singapore, was set up in 2015. All appeals from the SICC will be heard by the Court of Appeal of Singapore. The Singapore High Court judges and international judges of the Supreme Court may be designated by the Chief Justice to hear cases in the SICC. The Chief Justice and judges of appeal may also hear cases in the SICC.

2.4 I PR standards under free trade agreements

According to Enterprise Singapore, Singapore has signed 25 free trade agreements (FTAs) by the end of 2020, the latest one being the Regional Comprehensive Economic Partnership (RCEP) signed in November 2020. Table 2.2 overviews the Singapore FTAs. Considering the scope of this chapter, we will not elaborate on each FTA but analyse the FTAs with Singapore's major trading partners,[6] namely, United States (US)–Singapore FTA, Japan–Singapore FTA, Korea–Singapore FTA, China–Singapore FTA, and the EU–Singapore FTA.

After TRIPS, IP negotiations have been conducted in IP fora, such as the World Trade Organization (WTO) and WIPO, and other multilateral fora, such as the Convention on Biological Diversity that deals with the intersection between IP and other access-related issues (access to medicines, access to knowledge, and access to seeds by farmers) (Helfer 2004). On the other hand, the US has also incorporated IP into its post-TRIPS FTA negotiations

Table 2.2 FTAs of which Singapore is a Party

FTAs as an ASEAN Member (6)

- ASEAN–Australia–New Zealand Free Trade Area
- ASEAN–China Free Trade Area
- ASEAN–India Free Trade Area
- ASEAN–Japan Comprehensive Economic Partnership
- ASEAN–Korea Free Trade Area
- ASEAN Free Trade Area

Other Regional Trade Agreements (4)

- EFTA–Singapore Free Trade Agreement
- GCC–Singapore Free Trade Agreement
- Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)
- Regional Comprehensive Economic Partnership (RCEP)

Bilateral FTAs (15)

- China–Singapore Free Trade Agreement
- EU–Singapore Free Trade Agreement
- India–Singapore Comprehensive Economic Cooperation Agreement
- Japan–Singapore Economic Partnership Agreement
- Korea–Singapore Free Trade Agreement
- New Zealand–Singapore Comprehensive Economic Partnership
- Panama–Singapore Free Trade Agreement
- Peru–Singapore Free Trade Agreement
- Singapore–Australia Free Trade Agreement
- Singapore–Costa Rica Free Trade Agreement
- Singapore–Jordan Free Trade Agreement
- Sri Lanka–Singapore Free Trade Agreement
- Turkey–Singapore Free Trade Agreement
- United Kingdom–Singapore Free Trade Agreement
- United States–Singapore Free Trade Agreement

Note: As of 28 February 2021

Source: www.enterprisesg.gov.sg/non-financial-assistance/for-singapore-companies/free-trade-agreements/ftas/overview#

and introduced various TRIPS-plus standards.[7] These two trends of the international IP negotiations in the post-TRIPS era provide two perspectives for the analysis in this section: flexibilities to TRIPS and TRIPS-plus standards in the selected Singapore FTAs.

2.4.1 US–Singapore FTA

After Singapore and the US signed a bilateral FTA in 2003, Singapore amended its domestic laws for compliance. According to the US Congress publication on the three-year assessment on the US–Singapore FTA:

> The FTA provided the impetus for the Singapore government to amend its laws to create one of the strongest IPR regimes in Asia. In July 2004, amendments to the Trademarks Act,[8] the Patents Act, the Layout Designs of Integrated Circuits Act, Registered Designs Act, a new Plant Varieties Protection Act, and a new Manufacture of Optical Discs Act came into effect. This was followed in 2005 by an amended Copyright Act[9] and Broadcasting Act. Singapore also has implemented or ratified various international conventions or treaties dealing with IPRs
>
> (Nanto 2008)

Singaporean officials took a positive attitude towards such an amendment. For instance, they indicated that strengthened IPR protection in Singapore has contributed to attracting foreign direct investment and attracting big pharmaceutical and telecommunication companies to invest and locate their research centre in Singapore (Nanto 2008).

In addition to a commitment to amend domestic legislation, Singapore also acceded to the following multilateral IP treaties following its FTA commitments (date of accession indicated in bracket) (Hsu 2015):

i. The International Convention for the Protection of New Varieties of Plants (30 July 2004)
ii. The WIPO Copyright Treaty (17 April 2005)
iii. The WIPO Performances and Phonograms Treaty (1996) (17 April 2005)
iv. The Hague Agreement Concerning the International Registration of Industrial Designs (17 April 2005)

The US–Singapore FTA is an example of how the US strategically shifts fora for international IP negotiations from the multilateral to the bilateral level (Sell 2011). This FTA includes what the US Trade Representative considers major advances for the US: IP protection (Chapter 16), environment, labour, transparency, and customs cooperation (Nanto 2008). IP is also clearly mentioned as a form of asset that has the characteristic of investment.[10]

Table 2.3 illustrates the significant differences between the US–Singapore FTA and TRIPS. These TRIPS-plus provisions have made Singapore one of the jurisdictions with the highest level of IP protection in the world.

Table 2.3 Comparison of IP Standards between US–Singapore FTA and TRIPS

Issues	*US–Singapore FTA*	*TRIPS*
Term for copyright protection	Life of author plus 70 years.	Life of author plus 50 years.
Technological protection measures	Adequate protection against acts of circumvention. Ban on circumvention devices. Civil liability in case of wilful infringement. Criminal liability in case of wilful infringement for commercial purposes. Non-profit libraries, archives, educational institutions, as well as acts related to reverse engineering, troubleshooting, protection of minors, computer or network security, and lawfully authorised government activities can be exempted.	No provision on this issue.
Liability of Internet service providers	Limited liability of Internet service providers on the condition that they block infringing content upon notification by the copyright holder.	No provision on this issue.
Patent term extension due to delays in examination	Extension is given for delays caused by the regulatory approval process. Also, an extension is given when a delay in the granting of the patent exceeds four years from the filing of the application.	20 years, no extension is provided.
Compulsory licences	Compulsory licences limited to national emergencies, as an anti-trust remedy, and for public non-commercial use.	More broadly permitted on the condition that before unauthorised use, the proposed user has made efforts to obtain authorisation from the rights holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period. National emergency is a condition for waiving the above-mentioned requirement.

(*Continued*)

Table 2.3 (Continued)

Issues	*US–Singapore FTA*	*TRIPS*
Linkage between patent and drug marketing approval	Marketing approval of a generic drug is prohibited during the patent term unless authorised by the patent owner.	No provision on this issue.
Data exclusivity	Data exclusivity for five years. Also, where drug regulators rely on foreign marketing approvals, data exclusivity applies automatically at home.	No provision on this issue. Test data and other data are protected as undisclosed information under Art. 39.3 TRIPs.
Parallel imports of patented products	Patent holders may limit parallel imports of pharmaceutical products through licensing contracts.	None of its provisions, except those dealing with non-discrimination ('national treatment' and 'most-favoured-nation treatment'), can be used to address the issue of exhaustion of IPR in a WTO dispute.
Institutional flexibilities in IPR enforcement	Resource constraints cannot be invoked as an excuse for not complying with specific enforcement obligations.	TRIPS imposes no extra obligation for the distribution of resources as between enforcement of IPR and the enforcement of the law, in general.
Scope of border measures	Imported, exported, and transiting goods.	Imported goods.
Civil and administrative procedures	Obligation to fine infringers of copyright and trademark rights irrespective of the injury suffered by rights holders.	No such obligations.
Criminal procedures and remedies	Criminal procedures apply in case of wilful infringements, not only for a financial gain.	Criminal procedures and penalties shall be applied for wilful trademark counterfeiting or copyright piracy on a commercial scale. Members may provide for criminal procedures and penalties in other cases of IPR infringement, particularly where they are committed wilfully and on a commercial scale.

Source: Authors.

2.4.2 Japan–Singapore economic partnership agreement (EPA)

The Japan–Singapore EPA was signed in 2002. The IP chapter has only two pages, and its provisions are more flexible and oriented towards cooperation. For instance, the objective states that the two parties aim to develop cooperation in IP.[11] The first article in the IP chapter is about areas and forms of cooperation. It also gives priority to institution building. A joint committee on IP is established to facilitate the IP chapter's effective implementation (Article 97). It also emphasises facilitation for the use of the IP database (Article 98). The only 'hard' provision in this EPA is Article 98.1, which provides that 'Singapore shall, in accordance with its laws and regulations, take appropriate measures to facilitate the patenting process of an application filed in Singapore that corresponds to an application filed in Japan.'

Also, IP provisions in this FTA are more 'TRIPS defence' rather than 'TRIPS-plus'. For instance, Article 75.1 (f)(b) provides that TRIPS-compliant practices concerning IP are exempted from the prohibited performance requirement regarding the establishment, acquisition, expansion, management, operation, maintenance use, or possession of investment. Again, Article 86 also provides that national treatment in respect of IP rights is only applicable to the extent provided in TRIPS.

Like the US–Singapore FTA, IPR is also defined as categories of investment,[12] and specific types of IP are listed.[13]

2.4.3 Korea–Singapore FTA

Korea and Singapore signed their FTA in 2005. The IP chapter is also simple, with some provisions similar to the Japan–Singapore EPA. For instance, the provisions are TRIPS defence in nature. On enforcement, this FTA provides that 'the Parties shall, consistent with the TRIPS Agreement, provide for the enforcement of IPRs in their respective laws' (Article 17.3). It also focuses on facilitating cooperation in the area of IP (Article 17.5) and institution building (a joint committee to be established to facilitate implementation) (Article 17.9). It further includes a similar provision on patent filing facilitation as in the Japan–Singapore EPA.

One prominent provision in this FTA is the requirement for Singapore to designate the Korean IP Office (KIPO) as International Searching Authority (ISA) and International Preliminary Examination Authority (IPEA) under the Patent Cooperation Treaty (PCT). Although KIPO is one of the five biggest IP offices globally, along with the US Patent and Trademark Office, European Patent Office, Japan Patent Office, and the National Intellectual Property Administration of China (also known as the Chinese Patent Office), it is not the only one in East Asia. This designation did benefit Korea. However, from 2015, Singapore itself has become qualified as an ISA and IPEA under the PCT.

2.4.4 China–Singapore FTA

The 2010 bilateral FTA between China and Singapore did not mention IP. Since both countries are WTO members and are TRIPS signatories, not mentioning IP in an FTA means that TRIPS standards will automatically apply. When both parties upgraded their FTA in 2018, IP was not incorporated in the FTA either.

2.4.5 EU–Singapore FTA

The EU and Singapore signed their FTA in 2018. This FTA is not yet implemented. Its text has geographical indications (GIs) as one of the prominent issues. During the TRIPS negotiations, the EU attempted to establish a sui generis system to protect the GIs. However, the 'New World' countries led by the US contested this agenda. At the end of the TRIPS negotiations, GIs are protected at different levels: Article 22 provides a 'standard' form of protection for general products. In contrast, Article 23 provides stronger protection for wines and spirits. The difference between the two is that, according to Article 23 of the TRIPS Agreement, qualifiers such as 'kind', 'style', or 'like' cannot be used in the indication of the products. The EU started its negotiations of the deep-integration FTAs in 2006. The major objective for GI negotiation is to extend Article 23–level protection beyond wines and spirits, particularly agricultural products and foodstuffs. Specifically, the EU–Singapore FTA established a list of GIs for mutual recognition (Article 10.17). However, GIs' recognition is not 'mutual' as the EU listed 194 of its GIs to be protected in Singapore, while Singapore listed zero. Another objective of the EU is to give the GIs priority over trademarks.

2.4.6 Summary

In summary, Singapore is at the importing, rather than the exporting, end of IP regulation through FTAs. It has accepted high-level IP standards from the US and the EU but is not imposing higher standards on other countries (at least in the five FTAs we examined in this chapter). It defends TRIPS standards in its FTAs with China, Japan, and Korea. After the EU–Singapore FTA, the Intellectual Property (Border Enforcement) Act on 9 July 2018 implemented new treaty commitments concerning border measures. Major changes in the law empower customs offices to seize goods imported to and exported from Singapore upon request from rights holders. Previously, rights holders can only confiscate goods in the importation stage (Tan 2018).

2.5 Singapore's IP performance: making Singapore a brand

2.5.1 Ranked high in various IP-related indexes

As mentioned in Section 2.1, companies in Singapore are generally located at both ends of the smiling curve and, therefore, prioritise applications for patents, designs (related to R&D), and trademarks (related to branding and marketing).

This section examines Singapore's overall IP performance. Instead of exploring individual parameters such as patent application, patent granting, and trademark registration, we analysed more systematic and complicated indexes, which will reveal the country's IP performance more comprehensively. In general, Singapore's IP performance is recognised as having achieved the highest protection level and established the most efficient supporting bureaucratic system. Specifically, it has been ranked high in various IP-related indexes (IPOS 2018):

i. *World Economic Forum's Global Competitiveness Report 2018*: Singapore is ranked third globally and top in Asia for having the best IP protection.
ii. *International Property Rights Index*:[14] Singapore is ranked fifth in the world. The index measures the strength of a country's property rights regime, including both intellectual and physical property rights. iii. *US Global Intellectual Property Center's International IP Index 2018*: Singapore is ranked ninth in the world for its IP environment.
iv. *Bloomberg 2018 Innovation Index*: Singapore is ranked third in the world. The index scores economies using factors, including R&D spending and the concentration of high-tech public companies.
v. *Global Innovation Index 2018* by WIPO: Singapore is ranked the fifth most innovative nation globally and top in Asia. Singapore is ranked first in the world on the Innovation Input Sub-Index.

This part will first examine two of Singapore's IP performance indexes in more detail: WIPO's Global Innovation Index and the International IP index published by the US Chamber of Commerce. At the end, the performance of Singapore and other major ASEAN economies (Indonesia, Malaysia, and Thailand) will be compared and analysed to exhibit the uniqueness of Singapore in IP performance in the region.

WIPO's *Global Innovation Index 2018* measured both the input and output of innovation. The input indicators included institutions, human capital and research, infrastructure, market sophistication, and business sophistication. The outcome indicators included knowledge and technology outputs and creative outputs (WIPO 2018). Singapore ranked fifth among the 47 high-income countries and is the most innovative country in Southeast Asia and Oceania. Singapore's strengths can be found in the areas of institutions (first), human capital and research (first), and business sophistication (second). In particular, in terms of business sophistication, Singapore ranked very high in IP payments (first) and foreign direct investment inflows (first). An effective IP legal system guarantees these strengths and is essential to attracting talents and investment globally. Nonetheless, the weakness of Singapore's innovation system, including its IP system, lies in the creative outputs (or inability to lead to more creative outputs). It is lower than both the income group average and the regional average. It ranked 35th in Creative

US 37.98
UK

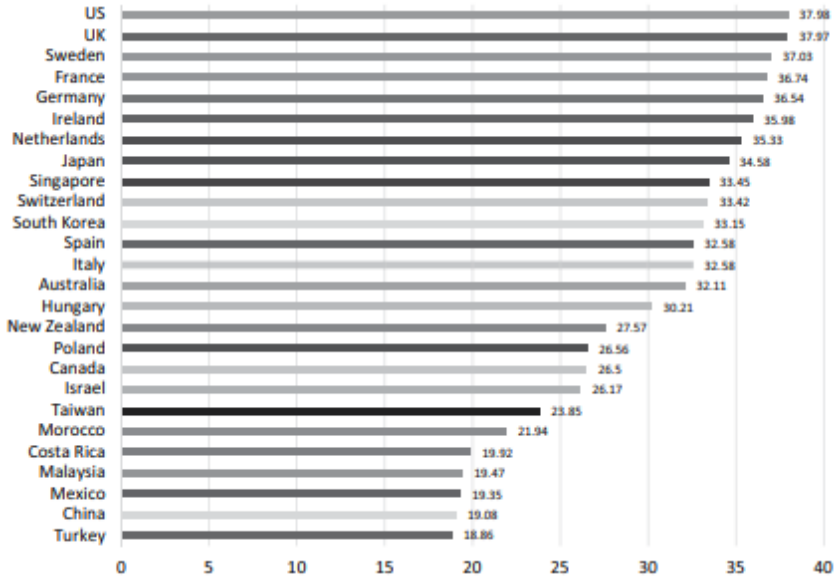

Figure 2.5 US Chamber of Commerce International IP Index 2018, Overall Scores.

Outputs globally for lack of creation from residents of the country. This can be seen in the following indicators: trademarks by origin (88th), industrial designs by origin (62nd), national feature films (38th), and printing and other media (70th).

The sixth annual International IP Index published by the US Chamber of Commerce divided IP performances into eight categories: category 1 – patents, related rights, and limitations; category 2 – copyright, related rights, and limitations; category 3 – trademarks, related rights, and limitations; category 4 – trade secrets and related rights; category 5 – commercialisation of IP assets; category 6 – enforcement; category 7 – systemic efficiency; and category 8 – membership in and ratification of international treaties.

Singapore ranked ninth in the overall scores of the US Chamber International IP Index 2018 (US Chamber of Commerce Global Innovation Policy Center 2018) (Figure 2.5). More specifically, Singapore ranked first in category 1 generally related to patents because of the newly added indicator of the participation in the patent prosecution highways. The IPOS had signed agreements with China, Mexico, and the European Patent Office. Singapore's copyright protection and system efficiency are also very close to the world's top five economies. However, in terms of trademarks, trade secrets, commercialisation of IP assets, and membership in international treaties, there is a gap between Singapore and the world's top five economies. The overall performance of Singapore is higher than the regional average.

2.6 Conclusion

To sum up, we observe a correlation between national IP performance and its position in the GVCs: the higher a country is located at the U curve, the higher its level of IP performance and vice versa. However, we do not have further evidence to establish a causal relationship between these two variables: whether higher IP protection causes a country or a firm to occupy a more profitable place in a GVC.

This correlation is complicated if we also consider the factor of foreign direct investment (FDI). The Southeast Asian countries and China have become the world's factory since the 1980s. Getting involved in the GVC has brought these countries large FDI inflows. They were also required to enhance their local capacities in various aspects. IP has been an essential prerequisite in the package of capacity building. The US has used various tools unilaterally (e.g. Special 301 Reports), bilaterally (incorporating IP into its FTAs), and multilaterally (framing IP as a trade-related issue and building it as a pillar of the WTO) to promote global IP standards.

It is crucial for developing Asian countries to think about their positions in the GVCs more strategically, particularly how to enhance their local capabilities required to sustain their long-term competitiveness. Taking from the Singaporean lesson, strategies that enable developing Asian countries to climb the smiling curve could include education and training of young people and IP specialists (patent examiners, patent attorneys, and IP lawyers and judges); functional and corruption-free legal system; responsive parliament to align statutory laws with current regional and global status; clear vision in negotiating and signing bilateral and regional trade agreements; governance transparency and long-term stability; favourable tax incentives; and a system to capture the best talents in the world, starting from the universities. Especially for other ASEAN countries, manufacturing activities are essential as they generate employment and trigger people's movement from rural to urban areas. Even Singapore has not abandoned or neglected this area and is moving towards smart manufacturing.

Notes

1 However, undoubtedly manufacturing secures middle-class jobs and creates networks of related industries (e.g. automobiles. For more discussion, see Kung-Chung Liu and Uday Racherla (eds.), *Innovation, Economic Development, and Intellectual Property in China and India – Comparing Six Economic Sectors* [Springer 2019]). Smart manufacturing could especially raise the bottom of the U curve upwards, closer to the other two ends. That is why India is promoting 'Make in India', and China has unveiled 'Made in China 2025'.

2 Literature on regulatory theories is abundant, see Drahos (2017). In the context of this chapter which focuses on global governance beyond states, regulation refers broadly to the means that guides individuals or institutions to behave according to formal or informal rules (Picciotti 2002).

3 According to Fujita (2018), foreign value-added indicates what part of a country's gross export comprises inputs that have been produced in other countries. The foreign value-added share is the share of the country's exports that do not add to its GDP.

4 https://wits.worldbank.org/countryprofile/en/country/SGP/startyear/1990/endyear/1994/indicator/NY-GDP-PCAP-CD
5 Specifically, the expert determination follows the WIPO Expert Determination Rules while the mediation follows the WIPO Mediation Rules.
6 According to Workman (2018), the major trading partners of Singapore are China: US$54 billion (14.5% of total Singapore exports); Hong Kong: $46 billion (12.3%); Malaysia: $39.6 billion (10.6%); Indonesia: $28 billion (7.5%); United States: $24.2 billion (6.5%); Japan: $17.1 billion (4.6%); Korea: $16.7 billion (4.5%); Taiwan: $16.6 billion (4.4%); Thailand: $14.7 billion (3.9%); Viet Nam: $12.3 billion (3.3%).
7 For this chapter, TRIPS-plus standards refer to IP standards that provide more extensive protection for IP compared with TRIPS or eliminate the flexibilities that are otherwise available in TRIPS.
8 In the area of trademarks, the amendment includes: (i) non-visual marks – a change in the definition of a trademark to remove the requirement of visual perceptibility as a precondition for registration. It is a TRIPS-plus standard in a sense that it eliminated a flexibility that is otherwise included in TRIPS; (ii) the addition of provisions on the dilution of marks – in the area of enforcement, the remedy of statutory damages was introduced. This often applies to cases where actual losses arising from the infringement may be difficult to prove or an account of profits equally difficult to obtain. Trademarks Act (Chapter 332) (Original Enactment: Act 46 of 1998), Revised Edition 2005. https://sso.agc. gov.sg/Act/TMA1998.
9 Most prominently, the copyright term is extended from 50 years to 70 years after the author's death.
10 Article 15.1 of the US–Singapore FTA recognises the following forms of investment: an enterprise; shares, stocks, and other forms of equity participation in an enterprise; bonds, debentures, and debt instruments and loans; futures, options, and other derivatives; turnkey, construction, management, production, concession, revenue-sharing, and other similar contracts; IPRs; licences, authorisations, permits, and similar rights conferred pursuant to applicable domestic law; and other tangible or intangible, movable or immovable property, and related property rights, such as leases, mortgages, liens, and pledges.
11 Article 1(a)(vii) Japan–Singapore EPA.
12 Article 72(a)(vi) Japan–Singapore EPA.
13 Article 72(a)(vi) provides that IPR includes trademarks, industrial designs, layout designs of integrated circuits, copyright, patents, trade names, indications of source or geographical indications, and undisclosed information.
14 The *International Property Rights Index* is the flagship publication of Property Rights Alliance. Available at: https://www.internationalpropertyrightsindex. org/.

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